

WORLD OF 2018 Annual Report



WORLD OF POSSIBILITIES





# *WORLD OF POSSIBILITIES*

2018 ANNUAL REPORT

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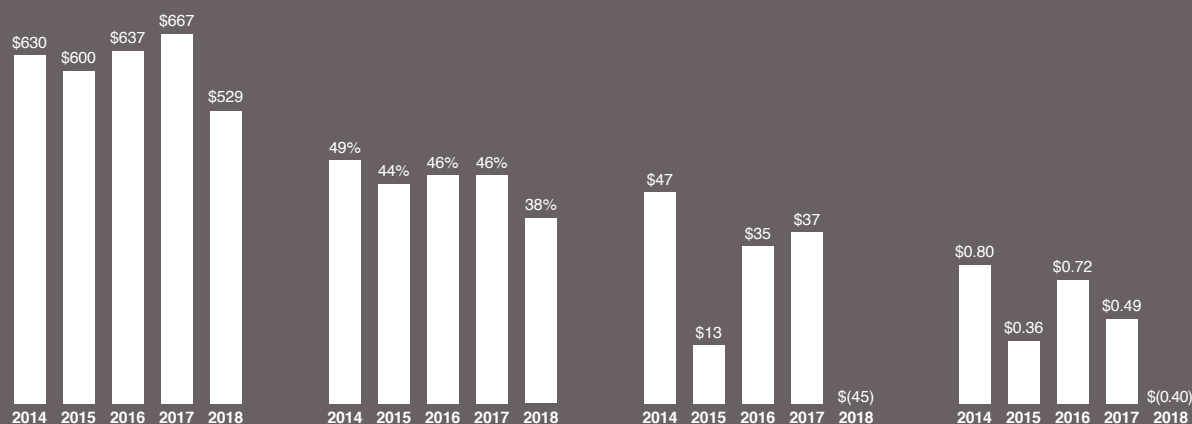
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# FINANCIAL HIGHLIGHTS

## Company Financial Summary

(Dollars in Millions, Except Per Share Amounts)



Annual Revenue

Gross Margin

Operating Income (Loss)

Annual Earnings (Loss) Per Share (Diluted)

## Consolidated Statements of Income Data

(In thousands, except per share amounts)

Years Ended December 31	2018	2017
Total Sales	\$529,277	\$666,900
Income (Loss) Before (Provision) Benefit for Income Taxes	\$(33,371)	\$44,687
Net Income (Loss)	\$(19,342)	\$23,840
Earnings (Loss) per Common Share (Diluted)	\$(0.40)	\$0.49

## Consolidated Balance Sheets Data

(In thousands)

Years Ended December 31	2018	2017
Unrestricted Cash and Marketable Securities	\$173,319 <sup>1</sup>	\$184,588 <sup>2</sup>
Total Assets	\$628,027	\$669,094
Stockholders' Equity	\$446,279	\$497,911

<sup>1</sup> Net of \$16 million in stock repurchases and \$17 million in dividend payments during 2018

<sup>2</sup> Net of \$17 million in stock repurchases and \$17 million in dividend payments during 2017

# WORLD OF POSSIBILITIES

As a global leader in the broadband access market, the ADTRAN team has had the privilege of meeting with our customers around the world, experiencing their unique cultures and understanding the opportunities and challenges for our industry and the communities they serve. While every culture is unique, it is clear that what unites us is the ability to connect. These connections, rather than diminishing individuality, enable us to share what makes us unique and connect with others not only in our local communities but around the world. Though a 24/7 globally connected marketplace can create challenges, the possibilities for both our customers and those that use these networks to connect, are limitless. People are leveraging these networks to learn, grow, entertain and protect their lives, families, and assets.

The exciting part is that we are just starting to scratch the surface of what is possible. We now live in a world where our thermostats track our location so our homes can be at the perfect temperature when we arrive. We hit a button on our phone for pretty much anything from mobile banking, to tracking fitness and health, to summoning a ride.

Our doorbells alert us with video monitoring when a stranger approaches our front door and an alert chimes if our son is driving over the speed limit. We are quickly adapting to the benefits of a connected world, but we have not yet begun to realize the full potential of our world of possibilities.

As we become more connected, we will experience a quantum leap into immersive ways to explore the world around us. Artificial intelligence and machine learning will unleash new applications and capabilities beyond our imagination, helping break down barriers, find cures, and address problems that challenge us on local, national and global scales. The truth is, no matter how far we think we have come, the world of possibilities has just begun to emerge.

At ADTRAN, we believe that amazing things happen when people connect. Our products, technologies, services, and teams will play a fundamental role in how this market develops, grows and scales.

# 2018

# I N R E F L E C T I O N

We entered 2018 aware of a direction change by one of our largest customers that would have a significant impact on our business. We responded by strengthening our focus on broadening and diversifying our customer and geographic mix. This enabled us to capture opportunities around the world with early adopters and influence those who will be in the majority—those who are just entering the planning stage. As a result, international revenue was up almost 52 percent year-over-year and comprised 45 percent of company revenue in 2018. We worked continually throughout the year to manage our cost structure positioning the company to aggressively pursue, capture and deliver on new opportunities. This enabled us to absorb the impact of these changes and position us for future growth.

I am pleased to report that we continue to make meaningful progress in customer diversification and engagement, product development, and expansion of our market opportunities, both domestically and globally. We capitalized on the possibilities before us and made strong progress in our efforts to diversify our customer base. We also strengthened our product portfolio with new organic developments as well as the addition of new products and solutions through acquisition.



*“...we continue to make meaningful progress in customer diversification and engagement, product development, and expansion of our market opportunities, both domestically and globally.”*







S H I F T S

# G

## I G A B I T B R O A D B A N D A C C E S S

Research firm, Ovum, predicts that broadband will continue its transformational effects to 2025 and beyond. The growing demand for broadband is creating a wealth of possibilities thanks to the maturation of several next-generation technologies like 10G-PON, Gfast, DOCSIS 3.1, and 5G.

Fiber is the enabler for the evolution of gigabit broadband services. The speed and scale afforded by fiber will enable service creation on a scale not possible with legacy networks. With 10-gigabit services on the immediate horizon, ADTRAN focused on helping our customers build the infrastructure to support these services and deliver gigabit and multi-gigabit services today.

There were many bright spots in 2018 including a major broadband award from a large Tier 1 operator in LATAM, a 10G-PON deployment launch in London, and continued volume deployments by Tier 1 and Tier 2 operators in our domestic market, solidifying our primary position in this segment. We also continue to have a solid position in the rural broadband market, adding many new accounts for fiber-to-the-premises and gigabit network buildouts.

We were pleased to announce and ship the industry's first gigabit-capable second-generation Gfast solutions. These distribution point units (DPUs) are part of a nationwide network buildout by a Tier 1 operator in Australia, further strengthening our position as the market leader.

The Connect America Fund (CAF) continues to be a driver for the expansion of broadband into rural America. The Federal Communications Commission (FCC) announced updates to the CAF program to improve the quality and availability of high-speed Internet service in rural

*“The demand for higher bandwidth and the increased use of fiber for cloud-computing services will continue to propel the growth of the fiber market for the foreseeable future.”*





America. Additionally, in 2018 the U.S. Department of Agriculture unveiled a \$600 million loan and grant program for 2019 to assist with the buildout of rural broadband infrastructure. To aid with CAF efforts, we introduced our sixth-generation sealed, micro Fiber-to-the-Node (FTTN) solutions. These low-cost, low-maintenance, flexible deployment solutions provide a cost-effective means for service providers to connect hard-to-reach subscribers. We experienced strong demand for our CAF solutions in 2018, with this area up 33 percent over the previous year.

We are seeing the development of a new broadband market segment in America, electric cooperatives and utilities. These organizations are willing to deliver gigabit services to rural residents and businesses that are unserved or underserved. They realize the importance of high-speed broadband, not only for their residents but for the community at large. We hosted the first-ever Fiber Forum earlier in the year designed to educate electric co-ops and utilities about the requirements for gigabit broadband deployment, its benefits and funding opportunities. We are pleased to report that we have successfully partnered with a number of these rural organizations to provide solutions for this critical service to their communities. We anticipate further growth in this new market segment in 2019 and beyond.

The demand for higher bandwidth and the increased use of fiber for cloud-computing services will continue to propel the growth of the fiber market for the foreseeable future. XGS-PON is leading the way with the ability to deliver symmetrical 10-gigabit services. As the market leader in this area, we made significant progress in 2018, bringing a number of new solutions to market and adding a number of new customers, both domestically and abroad.

We have maintained a strong focus on leveraging adjacent broadband markets. Two of these adjacent markets are Cable/MSO broadband access and the connected home.

Many traditional telecommunications service providers have been slow or reluctant to upgrade aging DSL users at any real scale. This has caused subscribers to turn to cable to have the ability to enjoy competitive broadband speeds. As a result, cable operators hold the dominant broadband market share in the U.S. with 64 percent of subscribers, compared to telcos at 36 percent.

Cable operators have played a major role in fostering the superfast broadband market in both the U.S. and Europe. American cable providers can provide speeds up to 2 Gbps today, thanks to DOCSIS 3.0, 3.1, and FTTx technologies. Many cable operators are considering switching

from hybrid fiber/coax solutions to Fiber-to-the-Premises or Fiber-to-the-Basement solutions.

I am pleased to report that we continued to extend our penetration in the Cable/MSO broadband access market this year, with solid growth of over 50 percent to our direct Cable/MSO customers over 2017. This market remains a strategic priority for us. Building upon our acquisitions of two market-leading fiber access businesses, along with our organic R&D developments, we achieved meaningful revenue progress with Tier 1 Cable/MSO operators with our 10G-EPON remote optical line terminal, head-end, and optical networking solutions. These solutions, coupled with our existing portfolio, strengthen our incumbent position with leading cable providers. We anticipate that our growth in this area will continue in 2019 and beyond. In fact, in Q3 a major MSO Tier 1 cable operator selected ADTRAN to provide next-generation SDN-capable 10G remote EPON solutions for a large deployment that will begin in 2019.

One of the markets benefiting from the availability of high-speed broadband is connected home. The connected home market is experiencing tremendous growth. Analysts project

that this market will reach \$138 billion by 2026. Connected home solutions enable the interoperability and interconnection of devices and appliances associated with security, healthcare, energy management, media, lighting, appliances, etc., via smartphones, computers or tablets. Late in the year, we acquired SmartRG, a leading global provider of open-source connected home platforms and cloud services. This acquisition opens the door to a world of possibilities for our customers, enabling them to extend their reach further into the home. These solutions enable service providers to optimize how services are delivered and consumed in this rapidly growing market. This also expands operators' ability to address the needs of small and medium businesses.

The SmartRG software platform, SmartOS, enables the development of both hardware-based and virtualized solutions. There are currently more than three-million SmartRG network devices in service, with 1.3 million devices managed monthly on a globally deployed software-as-a-service platform. Moving forward, the ability to tap into this expertise in software development and monetization will enable us to extend the value of our open, programmable and web-scalable Mosaic platform even further.



## EXPANDING ADTRAN'S POSSIBILITIES

*“SD-Access is one of the first steps toward vendor-agnostic open, programmable, scalable networks.”*



## GLIMPSE INTO THE FUTURE

Software Defined Access (SD-Access) holds a wealth of possibilities for today and tomorrow. We cannot fully fathom all that will be possible through a fully disaggregated network architecture. SD-Access is one of the first steps toward vendor-agnostic, open, programmable, scalable networks. ADTRAN is the leader in SD-Access solutions. We strengthened our commitment to this area in 2018 as we joined the Open Networking Foundation (ONF) and continued to expand and enhance our portfolio of Mosaic Cloud Platform solutions.

The creation of open, vendor agnostic, SD-Access solutions enables us to not only drive innovation with the world's largest service providers but allows us to help all communications providers prepare to transition their networks to meet increasing subscriber expectations for faster, better and more intuitive connectivity. ADTRAN's global leadership in SD-Access ensures we are well positioned to help operators who seek transformation to grow revenue, reduce costs and accelerate service delivery and deployment.



## LOOK AHEAD

There is a world of possibilities before us. ADTRAN is well positioned to capitalize on the market shifts in our core business and opportunities in new areas like connected home, Cable/Multiple System Operator (Cable/MSO) broadband access and fixed wireless. A diversified customer base; expanded geographical reach; and innovative, customer-focused solutions create multiple avenues for growth for 2019 and beyond.

I would like to take a moment to remember Lonnie McMillian, one of our company's original founders who passed away in December. Lonnie was an engineers' engineer and a true visionary. He had a passion for life

and for helping others. After retiring from ADTRAN, Lonnie was the co-founder of the HudsonAlpha Institute for Biotechnology, a nonprofit institute dedicated to developing and applying scientific advances to health, agriculture, learning, and commercialization. A gentle and humble man, he built a lasting legacy and will be greatly missed.

Finally, I must express my sincere appreciation to our employees. They have remained strong and focused, despite the headwinds that we faced in 2018. With their continued dedication, innovation and desire to exceed customer expectations, we can and will achieve great things.

Thomas R. Stanton  
Chairman and CEO  
ADTRAN, Inc.

*“ADTRAN is well positioned to capitalize on the market shifts in our core business and opportunities in new areas like connected home, Cable/MSO broadband access and fixed wireless.”*

# Financial Results

- 14 Market for Registrant’s Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities**
- 15 Stock Performance Graph**
- 16 Selected Financial Data**
- 17 Management’s Discussion and Analysis of Financial Condition and Results of Operations**
  - Overview
  - Results of Operations
    - 2018 Compared to 2017
    - 2017 Compared to 2016
  - Liquidity and Capital Resources
  - Recently Issued Accounting Pronouncements
  - Critical Accounting Policies & Estimates
  - Subsequent Events
- 33 Quantitative and Qualitative Disclosures About Market Risk**
- 34 Report of Independent Registered Public Accounting Firm**
- 36 Financial Statements**
- 41 Notes to Consolidated Financial Statements**
  - Note 1 – Nature of Business and Summary of Significant Accounting Policies
  - Note 2 – Business Combinations
  - Note 3 – Revenue
  - Note 4 – Stock-Based Compensation
  - Note 5 – Investments
  - Note 6 – Derivative Instruments and Hedging Activities
  - Note 7 – Inventory
  - Note 8 – Property, Plant and Equipment
  - Note 9 – Lease Arrangements
  - Note 10 – Goodwill and Intangible Assets
  - Note 11 – Alabama State Industrial Development Authority Financing and Economic Incentives
  - Note 12 – Income Taxes
  - Note 13 – Employee Benefit Plans
  - Note 14 – Segment Information and Major Customers
  - Note 15 – Commitments and Contingencies
  - Note 16 – Earnings (Loss) Per Share
  - Note 17 – Summarized Quarterly Financial Data (Unaudited)
  - Note 18 – Subsequent Events

This annual report contains forward-looking statements which reflect management’s best judgment based on factors currently known. However, these statements involve risks and uncertainties, including the successful development and market acceptance of new products, the degree of competition in the market for such products, the product and channel mix, component costs, manufacturing efficiencies, and other risks detailed in our annual report on Form 10-K for the year ended December 31, 2018. These risks and uncertainties could cause actual results to differ materially from those in the forward-looking statements included in this annual report.

# Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities

ADTRAN's common stock is traded on the NASDAQ Global Select Market under the symbol ADTN. As of February 7, 2019, ADTRAN had 166 stockholders of record and approximately 7,019 beneficial owners of shares held in street name. The following table shows the high and low closing prices per share for our common stock as reported by NASDAQ for the periods indicated.

## Common Stock Prices

2018	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
High	\$20.00	\$16.05	\$18.80	\$18.12
Low	\$15.35	\$13.95	\$14.95	\$10.43
2017	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
High	\$23.20	\$20.65	\$24.00	\$24.50
Low	\$20.75	\$19.10	\$20.05	\$19.35

The following table shows the shareholder dividends paid in each quarter of 2018 and 2017. The Board of Directors presently anticipates that it will declare a regular quarterly dividend so long as the present tax treatment of dividends exists and adequate levels of liquidity are maintained.

## Dividends per Common Share

2018	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
	\$0.09	\$0.09	\$0.09	\$0.09
2017	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
	\$0.09	\$0.09	\$0.09	\$0.09

## Stock Repurchases

The following table sets forth repurchases of our common stock for the months indicated.

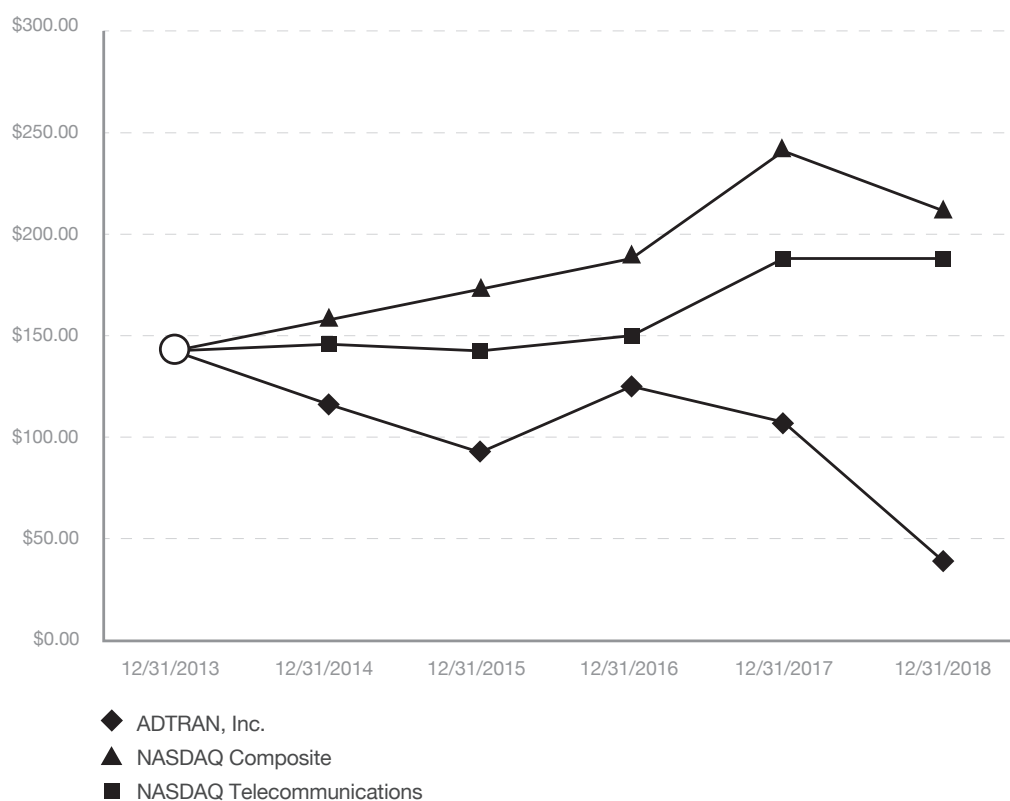
Period	Total Number of Shares Purchased	Average Price Paid Per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs <sup>(1)</sup>	Maximum Number of Shares That May Yet Be Purchased Under the Plans or Programs
October 1, 2018 – October 31, 2018	50,000	\$13.60	50,000	2,608,516
November 1, 2018 – November 30, 2018	50,000	\$13.33	50,000	2,558,516
December 1, 2018 – December 31, 2018	—	\$—	—	2,558,516
<b>Total</b>	<b>100,000</b>		<b>100,000</b>	

<sup>(1)</sup> Since 1997, our Board of Directors has approved multiple share repurchase programs that have authorized open market repurchase transactions of our common stock, which are implemented through open market or private purchases from time to time as conditions warrant. We currently have authorization to repurchase an additional 2.6 million shares of our common stock under the current authorization of up to 5.0 million shares.



## Stock Performance Graph

Our common stock began trading on the NASDAQ National Market on August 9, 1994. The price information reflected for our common stock in the following performance graph and accompanying table represents the closing sales prices of the common stock for the period from December 31, 2013, through December 31, 2018, on an annual basis. The graph and the accompanying table compare the cumulative total stockholders' return on our common stock with the NASDAQ Telecommunications Index and the NASDAQ Composite Index. The calculations in the following graph and table assume that \$100 was invested on December 31, 2013, in each of our common stock, the NASDAQ Telecommunications Index and the NASDAQ Composite Index and also assume dividend reinvestment.



	12/31/13	12/31/14	12/31/15	12/31/16	12/31/17	12/31/18
ADTRAN, Inc.	\$100.00	\$82.02	\$66.19	\$87.59	\$77.10	\$43.82
NASDAQ Composite	\$100.00	\$114.62	\$122.81	\$133.19	\$172.11	\$165.84
NASDAQ Telecommunications	\$100.00	\$102.75	\$100.20	\$106.61	\$130.48	\$130.76

# Selected Financial Data

## Income Statement Data

(In thousands, except per share amounts)

Year Ended December 31,	2018	2017	2016	2015	2014
Sales	\$529,277	\$666,900	\$636,781	\$600,064	\$630,007
Cost of sales <sup>(1)</sup>	325,712	363,265	345,451	333,166	318,704
<b>Gross profit</b>	<b>203,565</b>	<b>303,635</b>	<b>291,330</b>	<b>266,898</b>	<b>311,303</b>
Selling, general and administrative expenses <sup>(1)</sup>	124,440	135,583	131,848	123,540	131,999
Research and development expenses <sup>(1)</sup>	124,547	130,666	124,909	129,868	132,443
<b>Operating income (loss)</b>	<b>(45,422)</b>	<b>37,386</b>	<b>34,573</b>	<b>13,490</b>	<b>46,861</b>
Interest and dividend income	4,026	4,380	3,918	3,953	5,019
Interest expense	(533)	(556)	(572)	(596)	(677)
Net investment gain (loss)	(4,050)	4,685	5,923	10,337	7,278
Other income (expense), net <sup>(1)</sup>	1,286	(1,208)	(489)	(1,476)	1,425
Gain on bargain purchase of a business	11,322	—	3,542	—	—
<b>Income (loss) before (provision) benefit for income taxes</b>	<b>(33,371)</b>	<b>44,687</b>	<b>46,895</b>	<b>25,708</b>	<b>59,906</b>
(Provision) benefit for income taxes	14,029	(20,847) <sup>(2)</sup>	(11,666)	(7,062)	(15,286)
<b>Net income (loss)</b>	<b>\$19,342</b>	<b>\$23,840</b>	<b>\$35,229</b>	<b>\$18,646</b>	<b>\$44,620</b>
Weighted average shares outstanding – basic	47,880	48,153	48,724	51,145	55,120
Weighted average shares outstanding – assuming dilution <sup>(3)</sup>	47,880	48,699	48,949	51,267	55,482
Earnings (loss) per common share – basic	(\$0.40)	\$0.50	\$0.72	\$0.36	\$0.81
Earnings (loss) per common share – assuming dilution <sup>(3)</sup>	(\$0.40)	\$0.49	\$0.72	\$0.36	\$0.80
Dividends declared and paid per common share	\$0.36	\$0.36	\$0.36	\$0.36	\$0.36

## Balance Sheet Data

(In thousands)

At December 31,	2018	2017	2016	2015	2014
Working capital <sup>(4)</sup>	\$237,416	\$306,296	\$226,367	\$219,219	\$214,985
Total assets	\$628,027	\$669,094	\$667,235	\$632,904	\$738,694
Total debt	\$25,600	\$26,700	\$27,800	\$28,900	\$30,000
Stockholders' equity	\$446,279	\$497,911	\$479,517	\$480,160	\$549,013

<sup>(1)</sup> On January 1, 2018, we adopted ASU 2017-07, Compensation – Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost. We retrospectively adopted the presentation of service cost separate from other components of net periodic pension costs. As a result, \$0.4 million, \$0.2 million, (\$11,000) and \$0.3 million have been reclassified from cost of sales, selling, general and administrative expenses, and research and development expense to other income (expense), net for the years ended December 31, 2017, 2016, 2015 and 2014, respectively. See Note 1 of Notes to Consolidated Financial Statements included in Item 8 of this report for additional information.

<sup>(2)</sup> Provision for income taxes in 2017 reflected an estimated expense of \$11.9 million related to the Tax Cuts and Jobs Act, which was signed into law on December 22, 2017. See Note 12 of Notes to Consolidated Financial Statements, included in Item 8 of this report, for additional information.

<sup>(3)</sup> Assumes exercise of dilutive stock options calculated under the treasury method. See Notes 1 and 16 of Notes to Consolidated Financial Statements, included in Item 8 of this report. As a result of the net loss for the year ended December 31, 2018, we excluded 0.1 million of unvested stock options, PSU's, RSU's and restricted stock from the calculation of diluted EPS due to their anti-dilutive effect.

<sup>(4)</sup> Working capital consists of current assets less current liabilities. Amounts prior to 2016 have been recast to conform to the current period's presentation as a result of our adoption of Accounting Standards Update 2015-17, Balance Sheet Classification of Deferred Taxes. See Note 1 of Notes to Consolidated Financial Statements included in Item 8 of this report for additional information.

# Management's Discussion and Analysis of Financial Condition and Results of Operations

## Overview

ADTRAN is a leading global provider of networking and communications equipment, serving a diverse domestic and international customer base in 68 countries that includes Tier 1, 2 and 3 service providers, cable/MSOs and distributed enterprises. Our innovative solutions and services enable voice, data, video and internet communications across a variety of network infrastructures and are currently in use by millions of users worldwide. We support our customers through our direct global sales organization and our distribution networks. Our success depends upon our ability to increase unit volume and market share through the introduction of new products and succeeding generations of products having lower selling prices and increased functionality as compared to both the prior generation of a product and to the products of competitors. In order to service our customers and build revenue, we are constantly conducting research and development of new products addressing customer needs and testing those products for the particular specifications of the particular customers. In addition to our corporate headquarters in Huntsville, Alabama, we have research and development (R&D) facilities in strategic global locations.

We are focused on being a top global supplier of access infrastructure and related value-added solutions from the cloud edge to the subscriber edge. We offer a broad portfolio of flexible software and hardware network solutions and services that enable service providers to meet today's service demands, while enabling them to transition to the fully converged, scalable, highly automated, cloud-controlled voice, data, internet and video network of the future.

Our success depends upon our ability to increase unit volume and market share through the introduction of new products and succeeding generations of products having lower selling prices and increased functionality as compared to both the prior generation of a product and to the products of competitors. An important part of our strategy is to reduce the cost of each succeeding product generation and then lower the product's selling price based on the cost savings achieved in order to gain market share and/or improve gross margins. As a part of this strategy, we seek to be a high-quality, and in most instances the low-cost provider of products in our markets. Our success to date is attributable in large measure to our ability to design our products initially with a view to their subsequent redesign, allowing both increased functionality and reduced manufacturing costs in each succeeding product generation. This strategy enables us to sell succeeding generations of products to existing customers, while increasing our market share by selling these enhanced products to new customers.

Our business is global. We supply different sets of products to different customers in different regions around the world. Our financial results in any period reflect the activities of our various customers in their respective regions at any given time. In order to service our customers and build revenue, we are constantly conducting research and development of new products addressing customer needs and testing those products for the particular specifications of the particular customers. The lead times to revenues for these products vary.

The company made two acquisitions in 2018, strengthening its position in both the Cable/MSO and connected home markets. In the first quarter of 2018, we acquired the market-leading EPON business and certain assets for North America from Sumitomo Electric Industries Ltd. These solutions, combined with our organic fiber access product portfolio and our distributed access expertise, present new opportunities in the cable/MSO market. Also, in the fourth quarter of 2018, we acquired U.S.-based SmartRG, an industry-leading provider of carrier-class, connected-home software platforms and cloud services for broadband service providers. With this acquisition, ADTRAN now offers a complete cloud-to-consumer portfolio of virtualized management, data analytics, Wi-Fi-enabled residential gateways and software platforms. For more information, see Note 2 of the Notes to Consolidated Financial Statements included in Item 8 of this report.

As previously reported, we experienced a significant negative impact on our North American revenue as a result of a decision in mid-fourth quarter 2017 by a major customer to suspend a product rollout and network upgrade following a merger. While we continue to sell to that customer, the project in question has not yet resumed to prior levels, and we are unsure when, if ever, it will. During the periods covered in this report, our North American revenue was also impacted by slower-than-expected orders of an ultra-broadband product by a large domestic customer.

During the same period, however, we have seen an expansion of our revenues from much of the customer base and have brought to fruition our participation in a number of large customer projects, which in some cases have begun to produce some revenues and in all cases represent a possibility of significant revenue in the future. These include next-generation

PON projects with service providers, both domestically and internationally, the deployment for a large project in the APAC region, a significant network upgrade by a Tier 1 European customer, as well as continued expansion and opportunities for our EPON products to two of the top North American cable/MSO operators.

While our services business did not increase at the rate that it did in 2016 and 2017, and has decreased from the record levels we achieved in 2017 due to the above-mentioned merger-related disruption, we continue to develop our services business around the world, and we anticipate that it will continue to expand and remain an increasingly important part of our revenue streams across the world. Margins on services revenue vary depending upon the types of services performed.

We review our financial performance, specifically revenue and gross profit, based on two reportable segments – Network Solutions and Services & Support. Network Solutions software and hardware products provide solutions supporting fiber-, copper- and coaxial-based infrastructures and a growing number of wireless solutions, lowering the overall cost to deploy advanced services across a wide range of applications for Carrier, Cable/MSO networks and business networks, as well as prior-generation products. Our Services & Support enables our customers to accelerate time to market, reduce costs and improve customer satisfaction through a complete portfolio of services, including maintenance, turnkey network implementation, solutions integration, and managed services. ADTRAN's comprehensive network implementation services include engineering design and documentation (pre-construction), construction and installation (construction), and test, turn-up and provisioning (post-construction). Additionally, we partner with customers to tailor a program to each specific service-delivery need.

In addition, we also report revenue for the following three categories—**Access & Aggregation**, **Subscriber Solutions & Experience** (formerly Customer Devices) and **Traditional & Other Products**.

**Access & Aggregation** solutions are used by service providers to connect their network infrastructure to subscribers. This category includes software- and hardware-based products and services that aggregate and/or originate access technologies. The portfolio of ADTRAN solutions within this category includes a wide array of modular or fixed physical form factors designed to deliver the best technology and economic fit based on the target subscriber density and environmental conditions.

The Access & Aggregation category includes product and service families such as:

- Mosaic-branded network management and subscriber services control and orchestration software within SD-Access architectures;
- SDX series of SDN-controlled programmable network elements that form the hardware components within SD-Access architectures;
- Total Access 5000 Series Fiber to the Premises (FTTP) and Fiber to the Node (FTTN) Multi-Service Access Nodes (MSAN);
- hiX 5600 Series fiber aggregation and FTTN MSAN;
- Fiber to the Distribution Point (FTTdp) Gfast Distribution Point Units (DPUs);
- GPON, EPON and 10G PON Optical Line Terminals (OLTs);
- Optical Networking Edge (ONE) aggregation;
- IP-based Digital Subscriber Line Access Multiplexers (DSLAMs);
- Cabinet and Outside-Plant (OSP) enclosures and services;
- Pluggable optical transceivers (i.e., SFP, SFP+, XFP, QSFP), cables and other miscellaneous materials;
- Planning, engineering, program management, maintenance, installation and commissioning services to implement customer network solutions;
- Other products and services that are generally applicable to Access & Aggregation.

**Subscriber Solutions & Experience** (formerly Customer Devices) includes open-source connected home platforms, cloud services and any of our solutions and services that deliver residential and/or enterprise subscribers an immersive and interactive broadband experience from the service provider's access network. These products, software, and services include SmartRG solutions and applications, NetVanta Enterprise IP business gateways, access routers, Ethernet switches, ProCloud service offerings, residential and enterprise operating systems (such as SmartOS and AOS), Bluesocket Wi-Fi portfolio,

service provider and Cable/MSO Optical Network Terminals (ONTs), as well as related software applications and services. In alignment with our increased focus on enhancing customer experience for both business and consumer broadband customers as well as the addition of SmartRG during 2018, Customer Devices will now be known as Subscriber Solutions & Experience, as this more accurately represents this revenue category and our vision moving forward.

The Subscriber Solutions & Experience category includes products and services such as:

- Cloud-based SaaS management platforms for service providers to manage residential and enterprise networks;
- SaaS platforms for subscriber and network analytics collection used to enhance network operations and customer experience;
- SmartOS-branded embedded software licensing for residential and enterprise gateway and Wi-Fi devices;
- Broadband customer premises solutions, including GPON, XGS-PON, NG-PON2, EPON and 10G EPON and point-to-point Ethernet Optical Network Terminals (ONTs);
- Radio Frequency over Glass (RFoG) MicroNodes;
- Wi-Fi enabled residential gateway products and accessories across xDSL, Ethernet, DOCSIS, LTE, and fiber technologies;
- Enterprise Wi-Fi access points and associated powering and switching infrastructure;
- Enterprise Session Border Controller (eSBC) device platforms and software;
- Branch office business routers;
- Carrier Ethernet services termination devices;
- Voice over Internet Protocol (VoIP) media gateways;
- ProServices pre-sale and post-sale technical support;
- Planning, engineering, program management, maintenance, installation and commissioning services to implement customer devices solutions into consumer, small business and enterprise locations;
- Other products, software and services applicable to subscriber solutions and experience.

**Traditional & Other Products** generally includes a mix of prior-generation technologies' products and services, as well as other products and services that do not fit within the Access & Aggregation or Subscriber Solutions & Experience categories.

The Traditional & Other Products category includes products and services such as:

- Time Division Multiplexed (TDM) and Asynchronous Transfer Mode (ATM)-based aggregation systems and customer devices;
- HDSL, ADSL and other mature technologies used to deliver business and residential services over service provider access and customer networks;
- Other products and services outside the Access & Aggregation and Subscriber Solutions & Experience categories.

Our operating results have fluctuated on a quarterly basis in the past, and may vary significantly in future periods due to a number of factors, including customer order activity and backlog. A substantial portion of our shipments in any fiscal period relates to orders received and shipped within that fiscal period for customers under agreements containing non-binding purchase commitments. Further, a significant percentage of orders require delivery within a few days. These factors normally result in very little order backlog or order flow visibility. Additionally, backlog levels may vary because of seasonal trends, the timing of customer projects, and other factors that affect customer order lead times. Because many of our customers require prompt delivery of products, we are required to maintain sufficient inventory levels to satisfy anticipated customer demand. If near-term demand for our products declines, or if potential sales in any quarter do not occur as anticipated, our financial results could be adversely affected. Operating expenses are relatively fixed in the short term; therefore, a shortfall in quarterly revenues could significantly impact our financial results in a given quarter.

Our operating results may also fluctuate as a result of a number of other factors, including a decline in general economic and market conditions, foreign currency exchange rate movements, increased competition, customer order patterns, changes in product and services mix, timing differences between price decreases and product cost reductions, product warranty returns, expediting costs, tariffs and announcements of new products by us or our competitors. Additionally, maintaining sufficient

inventory levels to assure prompt delivery of our products increases the amount of inventory that may become obsolete and increases the risk that the obsolescence of this inventory may have an adverse effect on our business and operating results. Also, not maintaining sufficient inventory levels to assure prompt delivery of our products may cause us to incur expediting costs to meet customer delivery requirements, which may negatively impact our operating results in a given quarter.

Accordingly, our historical financial performance is not necessarily a meaningful indicator of future results, and, in general, management expects that our financial results may vary from period to period. See Note 17 of Notes to Consolidated Financial Statements, included in Item 8 of this report, for additional information. For a discussion of risks associated with our operating results, see Item 1A of this report.

## Results of Operations

The following table presents selected financial information derived from our consolidated statements of income expressed as a percentage of sales for the years indicated. Amounts may not foot due to rounding.

Year Ended December 31,	2018	2017	2016
<b>Sales</b>			
Products	86.6%	81.0%	82.5%
Services	13.4	19.0	17.5
<b>Total sales</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
<b>Cost of sales</b>			
Products	52.7	41.9	42.5
Services	8.8	12.6	11.7
<b>Total cost of sales</b>	<b>61.5</b>	<b>54.5</b>	<b>54.2</b>
<b>Gross profit</b>	<b>38.5</b>	<b>45.5</b>	<b>45.8</b>
Selling, general and administrative expenses	23.5	20.3	20.7
Research and development expenses	23.5	19.6	19.6
<b>Operating income (loss)</b>	<b>(8.6)</b>	<b>5.6</b>	<b>5.4</b>
Interest and dividend income	0.8	0.7	0.6
Interest expense	(0.1)	(0.1)	(0.1)
Net investment gain (loss)	(0.8)	0.7	0.9
Other income (expense), net	0.2	(0.2)	(0.1)
Gain on bargain purchase of a business	2.1	—	0.6
<b>Income (loss) before (provision) benefit for income taxes</b>	<b>(6.3)</b>	<b>6.7</b>	<b>7.4</b>
(Provision) benefit for income taxes	2.7	(3.1)	(1.8)
<b>Net income (loss)</b>	<b>(3.7)%</b>	<b>3.6%</b>	<b>5.5%</b>

## 2018 Compared to 2017

### Sales

Our sales decreased 20.6% from \$666.9 million for the year ended December 31, 2017, to \$529.3 million for the year ended December 31, 2018. The decrease in sales occurred over both our Network Solutions and our Services & Support reporting segments. Our Network Solutions sales decreased \$82.2 million compared to 2017, and our Services & Support sales decreased \$55.5 million versus the prior year. The decrease in our 2018 sales is primarily attributable to the termination of a multi-city broadband project, resulting from a merger-related review and slowdown in spending at a domestic Tier 1 customer that particularly affected our Access & Aggregation products and services, which decreased \$115.1 million in 2018. The 2018 decline in sales to this domestic Tier 1 customer was partially offset by an increase in international sales of \$81.7 million during the year, primarily as a result of increased sales to Tier 1 customers in the EMEA and Asia-Pacific regions. During 2018, sales of our Subscriber Solutions & Experience products decreased \$4.0 million, due primarily to decreases in sales of our fiber CPE, and sales of our Traditional & Other Products decreased \$18.6 million.

Network Solutions segment sales decreased by 15.2% from \$540.4 million in 2017 to \$458.2 million in 2018, due primarily to a decrease in our Access & Aggregation products. The decrease in sales of 16.6% of our Access & Aggregation products for 2018 is primarily attributable to the above-mentioned merger-related review and slowdown in spending at a domestic Tier 1 customer, partially offset by an increase in sales to international Tier 1 customers as discussed further below. The decrease of 2.9% in 2018 for sales of our Subscriber Solutions & Experience products is primarily attributable to the changes in sales of fiber CPE products. While we expect that revenues from Traditional & Other Products will continue to decline over time, these revenues may fluctuate and continue for years because of the time required for our customers to transition to newer technologies.

Services & Support sales decreased by 43.8% from \$126.5 million in 2017 to \$71.0 million in 2018. The decrease in sales for 2018 is primarily attributable to a significant decrease in network installation services for Access & Aggregation products related to the above mentioned merger-related review and slowdown in spending at a domestic Tier 1 customer.

Domestic sales decreased 43.2% from \$508.2 million in 2017 to \$288.8 million in 2018 which was a result of a decision in the mid-fourth quarter 2017 by a major customer to suspend a product rollout and network upgrade following a major. Excluding the impact of this customer, domestic sales increased by 9.1% in 2018 over the prior year.

International sales, which are included in the Network Solutions and Services & Support amounts discussed above, increased 51.5% from \$158.7 million in 2017 to \$240.4 million in 2018. International sales as a percentage of total sales increased from 23.8% in 2017 to 45.4% in 2018. The increase in sales for 2018 is primarily attributable to an increase in sales in EMEA and APAC. The increase in sales for 2018 in EMEA is primarily attributable to a network expansion program and a services award by a large European Tier 1 customer. The increase in sales in APAC for 2018 is primarily attributable to a network expansion program by a Tier 1 customer in Australia.

Our international revenues are largely focused on broadband infrastructure and are impacted by the decisions of our customers as to the timing for installation of new technologies, expansion of their networks and/or network upgrades. Our international customers must make these decisions in the regulatory and political environment in which they operate – both nationally and in some instances, regionally – whether of a multi-country region or a more local region within a country. For example, the European Commission launched a Gigabit Society initiative, and before that, the Digital Agenda, which has provided a favorable market environment for the deployment of ultra-broadband and Gigabit network solutions. Although the overall environment and market demand for broadband service deployment in the European Union have improved, some new broadband technologies are still being reviewed for regulatory and standards compliance, which may affect the timing of those technologies. In Mexico, regulatory changes have created uncertainty for customers resulting in slowdowns in their network buying patterns, which are only now beginning to be resolved. The competitive landscape in certain international markets is also impacted by the increased presence of Asian manufacturers that seek to compete aggressively on price. A strengthening U.S. dollar can also negatively impact our revenues in regions such as Latin America, where our products are traditionally priced in U.S. dollars, while in regions where our products are sold in local currency, such as Europe, a stronger U.S. dollar can negatively impact operating income. Consequently, while we expect the global trend towards deployment of more robust broadband speeds and access to continue creating additional market opportunities for us, the factors described above may result in pressure on revenues and operating income. However, we do not presently foresee a significant negative impact on our financial condition based on our strong liquidity and the generally positive environment described above.

We recognized a positive revenue impact in the first half of 2017 due to our being awarded a network expansion program by a large European Tier 1 customer. During 2018, this European Tier 1 customer undertook an additional network expansion project. Additionally, we anticipate that as our Latin American customers resume their network upgrade projects, we may experience further enhancement to our revenues. As announced, we received of a new nationwide award in the APAC region, as well as additional awards based on new ADTRAN technologies in the EMEA region that have, and we believe will continue to have, a positive impact to our revenues.

### **Cost of Sales**

As a percentage of sales, cost of sales increased from 54.5% for the year ended December 31, 2017, to 61.5% for the year ended December 31, 2018. The increase in the cost of sales as a percentage of sales is due primarily to regional revenue shifts, customer and product mix, services and support mix, restructuring expenses and an increase in warranty expense.

Network Solutions cost of sales, as a percent of that segment's sales, increased from 51.7% of sales in 2017 to 60.9% of sales in 2018. The increase in Network Solutions cost of sales as a percentage of that segment's sales is primarily attributable to a

regional revenue shift, customer and product mix, an increase in warranty expense from the prior year due to a settlement received in first quarter of 2017 from a third-party supplier for a defective component, higher product costs versus the prior year due to purchase discounts received from a contract manufacturer in the first quarter of 2017 and an increase in restructuring expenses incurred during 2018.

An important part of our strategy is to reduce the product cost of each succeeding product generation and then to lower the product's price based on the cost savings achieved. This may cause variations in our gross profit percentage due to timing differences between the recognition of cost reductions and the lowering of product selling prices.

Services & Support cost of sales, as a percent of that segment's sales, decreased from 66.2% of sales in 2017 to 65.8% of sales in 2018. The decrease in Services & Support cost of sales as a percentage of that segment's sales in 2018 is primarily attributable to customer mix, services and support mix, and certain cost reductions from restructuring related to the realignment of our Services & Support labor expense resulting from the above-mentioned merger-related termination of a network upgrade project by a domestic Tier 1 customer.

Our Services & Support revenues are comprised of network planning and implementation, maintenance, support and cloud-based management services, with network planning and implementation being the largest and fastest growing component. Our services business has experienced significant growth since 2015 as competitive pressures to expand broadband access and speeds have strained carriers' ability to respond to customer demand. However, the revenue associated with this business decreased from 2017 to 2018 due to the impact of the above-mentioned merger-related review and slowdown of a network upgrade project by a domestic Tier 1 customer. Compared to our other services, such as maintenance, support and cloud-based management services, our network planning and implementation services typically utilize a higher percentage of internal and sub-contracted engineers, professionals and contractors to perform the work for customers. The additional costs incurred to perform these infrastructure and labor-intensive services inherently result in lower average gross margins as compared to maintenance and support services.

As our network planning and implementation revenues have grown and are now the largest component of our Services & Support business, our Services & Support segment gross margins decreased versus those reported when maintenance and support comprised the majority of the business. Further, because the growth in our network planning and implementation services has resulted in our Services & Support revenues comprising a larger percentage of our overall revenues, and because our Services & Support gross margins are below those of the Network Solutions segment, our overall corporate gross margins have declined as that business has continued to grow. Within the Services & Support segment, we do expect variability in gross margins from quarter-to-quarter based on the mix of the services recognized.

#### **Selling, General and Administrative Expenses**

Selling, general and administrative expenses decreased by 8.2% from \$135.6 million in 2017 to \$124.4 million in 2018. Selling, general and administrative expenses include personnel costs for administration, finance, information technology, human resources, sales and marketing, and general management, as well as rent, utilities, legal and accounting expenses, advertising, promotional material, trade show expenses, and related travel costs. The decrease in selling, general and administrative expenses is primarily attributable to a decrease in compensation and labor expense, independent contractor expense, and travel expense, partially offset by an increase in restructuring expenses.

Selling, general and administrative expenses as a percentage of sales increased from 20.3% for the year ended December 31, 2017, to 23.5% for the year ended December 31, 2018. Selling, general and administrative expenses as a percentage of sales will generally fluctuate whenever there is a significant fluctuation in revenues for the periods being compared as these costs are relatively fixed in the short term.

#### **Research and Development Expenses**

Research and development expenses decreased by 4.7% from \$130.7 million for the year ended December 31, 2017, to \$124.5 million for the year ended December 31, 2018. The decrease in research and development expenses is primarily attributable to a decrease in compensation and labor expense, independent contractor expense, and travel expense, partially offset by an increase in restructuring expenses.

Research and development expenses as a percentage of sales increased from 19.6% for the year ended December 31, 2017, to 23.5% for the year ended December 31, 2018. Research and development expenses as a percentage of sales will fluctuate whenever there are incremental product development activities or significant fluctuations in revenues for the periods being compared.



We expect to continue to incur research and development expenses in connection with our new and existing products and our expansion into international markets. We continually evaluate new product and market opportunities and engage in significant research and development efforts which provide for new product development, enhancement of existing products and product cost reductions. We may incur significant research and development expenses prior to the receipt of revenues from a major new product group.

#### **Interest and Dividend Income**

Interest and dividend income decreased by 8.1% from \$4.4 million for the year ended December 31, 2017, to \$4.0 million for the year ended December 31, 2018. The decrease in interest and dividend income is primarily attributable to fluctuations in investment balances.

#### **Interest Expense**

Interest expense, which is primarily related to our taxable revenue bond, decreased by 4.1% from \$0.6 million for the year ended December 31, 2017, to \$0.5 million for the year ended December 31, 2018, as a result of a principal payment made on our taxable revenue bond during the year ended December 31, 2018. See “Financing Activities” in “Liquidity and Capital Resources” below for additional information on our taxable revenue bond.

#### **Net Investment Gain (Loss)**

Net investment gain (loss) reversed from a gain of \$4.7 million for the year ended December 31, 2017, to a loss of \$4.0 million for the year ended December 31, 2018. The decrease is primarily attributable to changes in fair value on equity securities recognized during the period under ASC 2016-01. Prior to January 1, 2018, changes in fair value were recognized in accumulated other comprehensive income, net of deferred taxes, on the balance sheet. With the adoption of ASC 2016-01 in January 2018, unrealized gains or losses are now recognized in other income in the period they are incurred. The loss in 2018 is a result of unrealized losses in our professionally-managed equity investment portfolios resulting from extreme equity market volatility in the fourth quarter of 2018. We expect that any future equity market volatility will result in continued volatility in gains or losses from our equity investment portfolios. See “Investing Activities” in “Liquidity and Capital Resources” and Note 1 and Note 5 of Notes to Consolidated Financial Statements included in Item 8 of this report for additional information.

#### **Other Income (Expense), net**

Other income (expense), net, which is comprised primarily of gains and losses on foreign currency transactions, gains and losses on foreign exchange forward contracts, investment account management fees, and miscellaneous income and expense, increased 206.5% from expense of \$1.2 million for the year ended December 31, 2017, to income of \$1.3 million for the year ended December 31, 2018. The change is primarily attributable to losses on foreign exchange contracts and transactions in 2017 as compared to foreign exchange gains in 2018.

#### **Gain on Bargain Purchase of a Business**

Gain on bargain purchase of a business is related to our acquisition of Sumitomo Electric Lightwave Corp’s North American EPON business and entry into a technology license and supply agreement with Sumitomo Electric Industries, Ltd. on March 19, 2018. See Note 2 of Notes to Consolidated Financial Statements included in Item 8 of this report for additional information.

#### **(Provision) Benefit for Income Taxes**

Our effective tax rate decreased from an expense of 46.7% for the year ended December 31, 2017, to a benefit of 42.0%, excluding the tax effect of the bargain purchase gain, for the year ended December 31, 2018. The decrease in the effective tax rate between the two periods was primarily driven by the current year losses in our domestic business and the expense recognized in 2017 related to the effect of the U.S. Tax Cuts and Jobs Act, which was signed into law on December 22, 2017. As a result of the 2017 tax law change, an expense of \$11.9 million was recorded in the fourth quarter of 2017, of which \$9.2 million related to the write-down of deferred tax assets and \$2.7 million related to tax on unrepatriated foreign earnings. Additional work to complete a more detailed analysis of historical foreign earnings, as well as the full impact to the write-down of deferred tax assets, was completed in the third quarter of 2018 and resulted in a tax benefit of \$4.0 million. See Note 12 of Notes to Consolidated Financial Statements included in Item 8 of this report for additional information.

#### **Net Income (Loss)**

As a result of the above factors, net income (loss) decreased from income of \$23.8 million for the year ended December 31, 2017 to a loss of \$(19.3) million for the year ended December 31, 2018. As a percentage of sales, net income (loss) decreased from 3.6% for the year ended December 31, 2017, to (3.7%) for the year ended December 31, 2018.

## 2017 Compared to 2016

### Sales

Our sales increased by 4.7% from \$636.8 million in 2016 to \$666.9 million in 2017. The increase in sales occurred over both our Network Solutions and our Services & Support reporting segments. Our Network Solutions sales increased \$14.9 million in 2017, and our Services & Support sales increased \$15.2 million compared to the prior year.

Network Solutions sales increased by 2.8% from \$525.5 million in 2016 to \$540.4 million in 2017. The increase in sales in 2017 is primarily attributable to an increase in sales of our Access & Aggregation products, partially offset by a decrease in sales of our Traditional & Other products. The increase in sales of our Access & Aggregation products is primarily attributable to increased VDSL2 vectoring product sales in the U.S. and European carrier markets. While we expect that revenues from Traditional & Other products will continue to decline over time, these revenues may fluctuate and continue for years because of the time required for our customers to transition to newer technologies.

Services & Support sales increased by 13.7% from \$111.3 million in 2016 to \$126.5 million in 2017. The increase in sales in 2017 is primarily attributable to an increase in network installation services for Access & Aggregation products.

International sales, which are included in the Network Solutions and Services & Support amounts discussed above, increased 17.2% from \$135.4 million in 2016 to \$158.7 million in 2017. International sales, as a percentage of total sales, increased from 21.3% in 2016 to 23.8% in 2017. The increase in international sales in 2017 is primarily attributable to an increase in sales in EMEA, partially offset by a decrease in sales in Latin America and the APAC region.

### Cost of Sales

As a percentage of sales, cost of sales increased from 54.2% in 2016 to 54.5% in 2017. The increase is primarily attributable to a regional revenue shift, customer and product mix and services and support mix.

Network Solutions cost of sales, as a percent of that segment's sales, increased from 51.5% of sales in 2016 to 51.7% of sales in 2017. The increase in Network Solutions cost of sales as a percentage of that segment's sales is primarily attributable to customer and product mix.

An important part of our strategy is to reduce the product cost of each succeeding product generation and then to lower the product's price based on the cost savings achieved. This may cause variations in our gross profit percentage due to timing differences between the recognition of cost reductions and the lowering of product selling prices.

Services & Support cost of sales, as a percent of that segment's sales, decreased from 67.2% of sales in 2016 to 66.2% of sales in 2017. The decrease in Services & Support cost of sales as a percentage of that segment's sales is primarily attributable to the mix of network installation programs and support.

### Selling, General and Administrative Expenses

Selling, general and administrative expenses increased 2.8% from \$131.8 million in 2016 to \$135.6 million in 2017. Selling, general and administrative expenses include personnel costs for administration, finance, information technology, human resources, sales and marketing, and general management, as well as rent, utilities, legal and accounting expenses, bad debt expense, advertising, promotional material, trade show expenses, and related travel costs. The increase in selling, general and administrative expenses is primarily attributable to increases in ERP implementation expense, deferred compensation expense, travel expense, and stock-based compensation expense, partially offset by a decrease in performance-based compensation expense.

Selling, general and administrative expenses as a percentage of sales decreased from 20.7% for the year ended December 31, 2016 to 20.3% for the year ended December 31, 2017. Selling, general and administrative expenses as a percentage of sales will generally fluctuate whenever there is a significant fluctuation in revenues for the periods being compared.

### Research and Development Expenses

Research and development expenses increased 4.6% from \$124.9 million in 2016 to \$130.7 million in 2017. The increase in research and development expenses is primarily attributable to an increase in labor and engineering materials related to customer specific projects, contract services and amortization of intangibles acquired in the third quarter of 2016.

Research and development expenses as a percentage of sales remained constant at 19.6% for the years ended December 31, 2016 and 2017. Research and development expenses as a percentage of sales will fluctuate whenever there are incremental product development activities or significant fluctuations in revenues for the periods being compared.

### **Interest and Dividend Income**

Interest and dividend income increased by 11.8% from \$3.9 million in 2016 to \$4.4 million in 2017. The increase in interest and dividend income is primarily attributable to an increase in the rate of return on investments.

### **Interest Expense**

Interest expense, which is primarily related to our taxable revenue bond, remained consistent at \$0.6 million in 2016 and 2017, as we had no substantial change in our fixed-rate borrowing. See “Financing Activities” in “Liquidity and Capital Resources” below for additional information on our taxable revenue bond.

### **Net Investment Gain**

Net investment gain decreased by 20.9% from \$5.9 million in 2016 to \$4.7 million in 2017. The decrease in realized investment gains is primarily attributable to decreased gains from the sale of equity securities. See “Investing Activities” in “Liquidity and Capital Resources” below for additional information.

### **Other Income (Expense), net**

Other income (expense), net, comprised primarily of miscellaneous income and expense, gains and losses on foreign currency transactions, gains and losses on foreign exchange forward contracts, investment account management fees, and scrap raw material sales, increased 147.0% from \$0.5 million of expense in 2016 to \$1.2 million of expense in 2017. The change is primarily attributable to increased losses on our foreign exchange contracts.

### **Gain on Bargain Purchase of a Business**

Gain on bargain purchase of a business in 2016 is related to our acquisition of key fiber access products, technologies and service relationships from subsidiaries of CommScope, Inc. on September 13, 2016. See Note 2 of Notes to Consolidated Financial Statements included in Item 8 of this report for additional information.

### **Provision for Income Taxes**

Our effective tax rate increased from 24.9% in 2016 to 46.7% in 2017. The increase in the effective tax rate between the two periods is primarily attributable to the Tax Cuts and Jobs Act, which was signed into law on December 22, 2017. As a result of the new law, we recognized an estimated expense of \$11.9 million in the fourth quarter of 2017, of which \$9.2 million related to the write-down of deferred tax assets and \$2.7 million related to tax on unrepatriated foreign earnings. See Note 12 of Notes to Consolidated Financial Statements included in Item 8 of this report for additional information.

### **Net Income**

As a result of the above factors, net income decreased from \$35.2 million in 2016 to \$23.8 million in 2017. As a percentage of sales, net income decreased from 5.5% in 2016 to 3.6% in 2017.

## **Liquidity and Capital Resources**

### **Liquidity**

We currently expect to finance our operations with cash flow from operations. We have used, and expect to continue to use, the cash generated from operations for working capital, business acquisitions, purchases of treasury stock, shareholder dividends, and other general corporate purposes, including product development activities to enhance our existing products and develop new products and expansion of our sales and marketing activities. We believe our cash and cash equivalents, investments and cash generated from operations to be adequate to meet our operating and capital needs for at least the next 12 months.

At December 31, 2018, cash on hand was \$105.5 million and short-term investments were \$3.2 million, which resulted in available short-term liquidity of \$108.7 million, of which \$87.1 million was held by our foreign subsidiaries. At December 31, 2017, cash on hand was \$86.4 million and short-term investments were \$16.1 million, which resulted in available short-term liquidity of \$102.6 million, of which \$56.8 million was held by our foreign subsidiaries. The increase in short-term liquidity from December 31, 2017, to December 31, 2018, is primarily attributable to cash held by certain foreign subsidiaries, at least some of which we expect to repatriate as tax and regulatory considerations may allow.

### **Operating Activities**

Our working capital, which consists of current assets less current liabilities, decreased 22.5% from \$306.3 million as of December 31, 2017 to \$237.4 million as of December 31, 2018. The current ratio, defined as current assets divided by current liabilities, decreased from 3.87 as of December 31, 2017, to 3.01 as of December 31, 2018. The decrease in our working capital and current ratio is primarily attributable to a decrease in net accounts receivable, inventory, and short term investments as well as an increase in income tax payable. The quick ratio, defined as cash and cash equivalents, short-term investments, and net accounts receivable, divided by current liabilities, decreased from 2.31 as of December 31, 2017, to 1.76 as of December 31, 2018. The decrease in the quick ratio is primarily attributable to a decrease in net accounts receivable and short term investments with an increase in income taxes payable. This decrease was slightly offset by an increase in cash and cash equivalents.

Net accounts receivable decreased 31.1% from \$144.2 million at December 31, 2017, to \$99.4 million at December 31, 2018. Our allowance for doubtful accounts was \$0.1 million at December 31, 2018. We did not have an allowance for doubtful accounts at December 31, 2017. Quarterly accounts receivable DSO decreased from 105 days as of December 31, 2017, to 65 days as of December 31, 2018. The decrease in net accounts receivable and DSO is attributable to customer specific payment terms agreed upon in 2017 that became due in the first quarter of 2018 and the timing of sales and other collections during the quarter.

Other receivables increased 38.1% from \$26.6 million at December 31, 2017, to \$36.7 million at December 31, 2018. The increase in other receivables is primarily attributable to an increase in contract assets, purchasing shipments, investment loan receivable and income tax receivables.

On February 25, 2019, one of the Company's customers filed for voluntary Chapter 11 bankruptcy as a result of a court ruling resulting in a substantial legal judgment against the customer. In 2018, this customer accounted for less than 5% of the Company's revenue. As of December 31, 2018, the Company had \$2.6 million related to product and services revenue and \$0.3 million related to a leased equipment arrangement included in accounts receivable on the Consolidated Balance Sheet that was due from this customer. As of December 31, 2018, the Company had \$9.4 million included in other receivables related to a leased equipment arrangement on its Consolidated Balance Sheet that was due from this customer. Since December 31, 2018, and through the date of this filing, all \$2.6 million of the outstanding products and services accounts receivable and \$0.1 million of the outstanding accounts receivable related to leased equipment have been collected. Additionally, \$1.7 million of the outstanding other receivables related to leased equipment have been collected. Therefore, there is potential risk of uncollectibility up to \$7.8 million on the remaining outstanding receivable balances as of December 31, 2018. The Company has evaluated the collectibility of the remaining receivable balances with the best available and applicable information as of the date of this filing and the impact was not material to the consolidated financial statements as of December 31, 2018. The Company will continue to evaluate the collectibility of the remaining accounts receivable balances in subsequent reporting periods. Additionally, it is uncertain at this time the impact this voluntary bankruptcy filing might have on the Company's operating income prospectively; however, the Company believes it will not have a significant impact on the Company's liquidity and capital resources.

Annual inventory turnover decreased from 3.19 turns as of December 31, 2017, to 2.93 turns as of December 31, 2018. Inventory decreased 18.5% from \$122.5 million at December 31, 2017 to \$99.8 million at December 31, 2018. We expect inventory levels to fluctuate as we attempt to maintain sufficient inventory in response to seasonal cycles of our business ensuring competitive lead times while managing the risk of inventory obsolescence that may occur due to rapidly changing technology and customer demand.

Accounts payable increased 0.7% from \$60.6 million at December 31, 2017, to \$61.1 million at December 31, 2018. Accounts payable will fluctuate due to variations in the timing of the receipt of supplies, inventory and services and our subsequent payments for these purchases.

### **Investing Activities**

Capital expenditures totaled approximately \$8.1 million, \$14.7 million and \$21.4 million for the years ended December 31, 2018, 2017 and 2016, respectively. These expenditures were primarily used to purchase computer hardware, software, manufacturing and test equipment, and building improvements.

Our combined short-term and long-term investments decreased \$34.3 million from \$146.4 million at December 31, 2017 to \$112.1 million at December 31, 2018. This decrease reflects the impact of our cash used for business acquisitions, share repurchases, shareholder dividends, property, plant and equipment purchases, as well as net realized losses on these investments.

We invest all available cash not required for immediate use in operations primarily in securities that we believe bear minimal risk of loss. At December 31, 2018, these investments included corporate bonds of \$20.7 million, municipal fixed-rate bonds of \$1.3 million, asset-backed bonds of \$5.2 million, mortgage/agency-backed bonds of \$3.8 million, U.S. government bonds of \$9.2 million, and foreign government bonds of \$0.6 million. At December 31, 2017, these investments included corporate bonds of \$32.5 million, municipal fixed-rate bonds of \$2.9 million, asset-backed bonds of \$6.5 million, mortgage/agency-backed bonds of \$5.5 million, U.S. government bonds of \$14.3 million and foreign government bonds of \$0.7 million. As of December 31, 2018, our corporate bonds, municipal fixed-rate bonds, asset-backed bonds, mortgage/agency-backed bonds, U.S. government bonds, and foreign government bonds were classified as available-for-sale and had a combined duration of 1.55 years with an average credit rating of A+. Because our bond portfolio has a high-quality rating and contractual maturities of short duration, we are able to obtain prices for these bonds derived from observable market inputs, or for similar securities traded in an active market, on a daily basis.

Our long-term investments decreased 16.5% from \$130.3 million at December 31, 2017, to \$108.8 million at December 31, 2018. Long-term investments at December 31, 2018, and December 31, 2017, included investments in various marketable equity securities classified as long-term investments with a fair market value of \$27.0 million and \$35.7 million, at December 31, 2018, and December 31, 2017, respectively. Our long-term investments also included an investment in a certificate of deposit of \$25.6 million and \$27.8 million, respectively, which serves as collateral for our revenue bond, as discussed below.

Long-term investments at December 31, 2018 and 2017 also included \$18.3 million and \$19.9 million, respectively, related to our deferred compensation plan, and \$0.4 million and \$0.5 million, respectively, of other investments, consisting of interests in two private equity funds.

Acquisition of businesses, net of cash acquired, totaled \$22.0 million, zero and \$0.9 million for the years ended December 31, 2018, 2017 and 2016, respectively. See Note 2 of Notes to Consolidated Financial Statements included in Item 8 of this report for additional information.

### **Financing Activities**

In conjunction with the 1995 expansion of our Huntsville, Alabama, facility, we were approved for participation in an incentive program offered by the State of Alabama Industrial Development Authority (the Authority). Pursuant to the program, on January 13, 1995, the Authority issued \$20.0 million of its taxable revenue bonds and loaned the proceeds from the sale of the bonds to ADTRAN. The bonds were originally purchased by AmSouth Bank of Alabama (now Regions Bank of Alabama) (the Bank). Wachovia Bank, N.A., Nashville, Tennessee (formerly First Union National Bank of Tennessee) (the Bondholder), which was acquired by Wells Fargo & Company on December 31, 2008, purchased the original bonds from the Bank and made further advances to the Authority, bringing the total amount outstanding to \$50.0 million. An Amended and Restated Taxable Revenue Bond (Amended and Restated Bond) was issued and the original financing agreement was amended. The Amended and Restated Bond bears interest, payable monthly. The interest rate is 2% per annum. The Amended and Restated Bond matures on January 1, 2020, and is currently outstanding in the aggregate principal amount of \$25.6 million. The estimated fair value of the bond using a level 2 valuation technique at December 31, 2018, was approximately \$25.4 million, based on a debt security with a comparable interest rate and maturity and a Standard & Poor's credit rating of AAA. We are required to make payments to the Authority in amounts necessary to pay the interest on the Amended and Restated Bond. Included in long-term investments at December 31, 2018, is \$25.6 million which is invested in a restricted certificate of deposit. These funds serve as a collateral deposit against the principal of this bond, and we have the right to set-off the balance of the Amended and Restated Bond with the collateral deposit in order to reduce the balance of the indebtedness.

In conjunction with this program, we are eligible to receive certain economic incentives from the state of Alabama that reduce the amount of payroll withholdings that we are required to remit to the state for those employment positions that qualify under the program. We realized economic incentives related to payroll withholdings totaling \$1.4 million, \$1.5 million and \$1.3 million for the years ended December 31, 2018, 2017 and 2016.

We made principal payments of \$1.1 million for each of the years ended December 31, 2018 and 2017, and we anticipate making a principal payment in 2019. At December 31, 2018 and 2017, \$1.0 million and \$1.1 million, respectively of the bond debt was classified as a current liability in accounts payable in the Consolidated Balance Sheets included in Item 8 of this report.

## Dividends

During 2018, 2017 and 2016, we paid shareholder dividends totaling \$17.3 million, \$17.4 million and \$17.6 million, respectively. The Board of Directors presently anticipates that it will declare a regular quarterly dividend so long as the present tax treatment of dividends exists and adequate levels of liquidity are maintained. The following table shows dividends per common share paid to our shareholders in each quarter of 2018, 2017 and 2016.

## Dividends per Common Share

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
2018	\$0.09	\$0.09	\$0.09	\$0.09
2017	\$0.09	\$0.09	\$0.09	\$0.09
2016	\$0.09	\$0.09	\$0.09	\$0.09

## Stock Repurchase Program

Since 1997, our Board of Directors has approved multiple share repurchase programs that have authorized open market repurchase transactions of our common stock, which are implemented through open market or private purchases from time to time as conditions warrant. For the years 2018, 2017 and 2016, we repurchased 1.0 million shares, 0.9 million shares and 1.4 million shares, respectively, for a cost of \$15.5 million, \$17.3 million and \$25.8 million, respectively, at an average price of \$15.52, \$20.27 and \$18.29 per share, respectively. We currently have authorization to repurchase an additional 2.6 million shares of our common stock under the current authorization of up to 5.0 million shares.

## Stock Option Exercises

To accommodate employee stock option exercises, we issued 0.1 million shares of treasury stock for \$1.5 million during the year ended December 31, 2018, 0.7 million shares of treasury stock for \$13.4 million during the year ended December 31, 2017, and 0.3 million shares of treasury stock for \$4.7 million during the year ended December 31, 2016.

## Off-Balance Sheet Arrangements and Contractual Obligations

We do not have off-balance sheet financing arrangements and have not engaged in any related party transactions or arrangements with unconsolidated entities or other persons that are reasonably likely to materially affect liquidity or the availability of or requirements for capital resources.

We have various contractual obligations and commercial commitments. The following table sets forth, in millions, the annual payments we are required to make under contractual cash obligations and other commercial commitments at December 31, 2018.

## Contractual Obligations

(In millions)	Total	2019	2020	2021	2022	2023	After 2023
Short-term and long-term debt	\$25.6	\$—	\$25.6	\$—	\$—	\$—	\$—
Interest on short-term and long-term debt	0.5	0.5	—	—	—	—	—
Purchase obligations	127.1	126.1	0.9	0.1	—	—	—
Operating lease obligations	14.4	3.9	3.6	2.8	2.0	1.3	0.8
Totals	\$167.6	\$130.5	\$30.1	\$2.9	\$2.0	\$1.3	\$0.8

We are required to make payments necessary to pay the interest on the Amended and Restated Bond, currently outstanding in the aggregate principal amount of \$25.6 million. The bond matures on January 1, 2020, and bears interest at the rate of 2% per annum. Included in long-term investments are \$25.6 million of restricted funds, which is a collateral deposit against the principal amount of this bond. We made principal payments of \$1.1 million for each of the years ended December 31, 2018 and 2017. We anticipate making a principal payment in 2019. At December 31, 2018 and 2017, \$1.0 million and \$1.1 million, respectively of the bond debt was classified as a current liability in accounts payable in the Consolidated Balance Sheets included in Item 8 of this report. See Note 11 of Notes to Consolidated Financial Statements included in Item 8 of this report for additional information.

Purchase obligations primarily relate to open purchase orders to our contract manufacturers, component suppliers, service partners, and other vendors.

Operating lease obligations primarily relate to future minimum rental payments under non-cancelable operating leases, including renewals determined to be reasonably assured, with original maturities of greater than 12 months.

We have committed to invest up to an aggregate of \$7.9 million in two private equity funds, and we have contributed \$8.4 million as of December 31, 2018, of which \$7.7 million has been applied to these commitments. The additional \$0.2 million commitment has been excluded from the table above due to the uncertainty of when it will be applied.

We also have obligations related to uncertain income tax positions that have been excluded from the table above due to the uncertainty of when the related expense will be recognized. See Note 12 of Notes to Consolidated Financial Statements included in Item 8 of this report for additional information.

### **Recently Issued Accounting Pronouncements**

For a discussion of recently issued accounting pronouncements, see Note 1 of Notes to Consolidated Financial Statements included in Item 8 of this report for additional information.

### **Critical Accounting Policies and Estimates**

An accounting policy is deemed to be critical if it requires an accounting estimate to be made based on assumptions about matters that are highly uncertain at the time the estimate is made, if different estimates reasonably could have been used, or if changes in the accounting estimate that are reasonably likely to occur could materially impact the results of financial operations. We believe the following critical accounting policies affect our more significant judgments and estimates used in the preparation of our consolidated financial statements. These policies have been consistently applied across our two reportable segments: (1) Network Solutions and (2) Services & Support.

### **Revenue Recognition**

Revenue is measured based on the consideration we expect to receive in exchange for transferring goods or providing services to a customer and as performance obligations under the terms of the contract are satisfied. Generally, this occurs with the transfer of control of a product or service to the customer. For transactions where there are multiple performance obligations, we account for individual products and services separately if they are distinct (if a product or service is separately identifiable from other items and if a customer can benefit from it on its own or with other resources that are readily available to the customer). The consideration, including any discounts, is allocated between separate products and services based on their stand-alone selling prices. The stand-alone selling prices are determined based on the prices at which we sell the separate products and services and are allocated based on each item's relative value to the total value of the products and services in the arrangement. For items that are not sold separately, we estimate stand-alone selling prices primarily using the "expected cost plus a margin" approach. Payment terms are generally 30 days in the U.S. and typically longer in many geographic markets outside the U.S. Shipping fees are recorded as revenue and the related cost is included in cost of sales. Sales, value-added and other taxes collected concurrently with revenue-producing activities are excluded from revenue. Costs of obtaining a contract are capitalized and amortized over the period that the related revenue is recognized if greater than one year. We have elected to apply the practical expedient related to the incremental costs of obtaining contracts and recognize those costs as an expense when incurred if the amortization period of the assets is one year or less. These costs are included in selling, general and administrative expenses. Capitalized costs with an amortization period greater than one year were immaterial.

The following is a description of the principal activities from which we generate our revenue by reportable segment.

#### **Network Solutions Segment**

Network Solutions includes software and hardware products and software defined next-generation virtualized solutions used in service provider or business networks, as well as prior generation products. The majority of the revenue from this segment is from hardware sales.

#### **Hardware and Software Revenue**

Revenue from hardware sales is recognized when control is transferred to our customers, which is generally when we ship the products. Shipping terms are generally FOB shipping point. This segment also includes revenues from software license sales which is recognized at delivery and transfer of control to the customer. Revenue is recorded net of estimated discounts and rebates using historical trends. Customers are typically invoiced when control is transferred and revenue is recognized. Our products generally include assurance-based warranties of 90 days to five years for product defects, which are accrued at the time revenue is recognized.

In certain transactions, we are also the lessor in sales-type lease arrangements for network equipment that have terms of 18 months to five years. These arrangements typically include network equipment, network implementation services and maintenance services. Product revenue for these leases is generally recorded when we transfer control of the product to our customers. Revenue for network implementation and maintenance services is recognized as described below. Customers are typically invoiced and pay in equal installments over the lease term. In relation to these lease agreements, during the years ended December 31, 2018, 2017 and 2016 we recognized revenue of \$13.7 million, \$16.5 million and \$2.7 million, respectively.

### **Services & Support Segment**

To complement our Network Solutions segment, we offer a complete portfolio of maintenance, network implementation, and solutions integration and managed services, which include hosted cloud services and subscription services.

### **Maintenance Revenue**

Our maintenance service periods range from one month to five years. Customers are typically invoiced and pay for maintenance services at the beginning of the maintenance period. We recognize revenue for maintenance services on a straight-line basis over the maintenance period in services revenue as our customers benefit evenly throughout the contract term and deferred revenues are recorded in current and non-current unearned revenue.

### **Network Implementation Revenue**

We recognize revenue for network implementation, which primarily consists of engineering, execution and enablement services, at a point in time when each performance obligation is complete. If we have recognized revenue, but have not billed the customer, the right to consideration is recognized as a contract asset that is included in other receivables in the Consolidated Balance Sheet. The contract asset is transferred to accounts receivable when the completed performance obligation is invoiced to the customer.

### **Inventory**

We carry our inventory at the lower of cost and net realizable value, with cost being determined using the first-in, first-out method. We use standard costs for material, labor, and manufacturing overhead to value our inventory. Our standard costs are updated on at least a quarterly basis and any variances are expensed in the current period; therefore, our inventory costs approximate actual costs at the end of each reporting period. We write down our inventory for estimated obsolescence or unmarketable inventory by an amount equal to the difference between the cost of inventory and the estimated fair value based upon assumptions about future demand and market conditions. If actual future demand or market conditions are less favorable than those projected by management, we may be required to make additional inventory write-downs. Our reserve for excess and obsolete inventory was \$30.0 million and \$23.4 million at December 31, 2018 and 2017, respectively. Inventory disposals charged against the reserve were \$0.4 million, \$8.3 million and \$4.7 million for the years ended December 31, 2018, 2017 and 2016, respectively.

### **Stock-Based Compensation**

For purposes of determining the estimated fair value of our stock option awards on the date of grant, we use the Black-Scholes Model. This model requires the input of certain assumptions that require subjective judgment. These assumptions include, but are not limited to, expected stock price volatility over the term of the awards and actual and projected employee stock option exercise behaviors. Because our stock option awards have characteristics significantly different from those of traded options, and because changes in the input assumptions can materially affect the fair value estimate, the existing model may not provide a reliable, single measure of the fair value of our stock option awards. For purposes of determining the estimated fair value of our market-based performance stock unit (PSU) awards on the date of grant, we use a Monte Carlo Simulation valuation method. These PSUs are subject to a market condition based on the relative total shareholder return of ADTRAN against all of the companies in the NASDAQ Telecommunications Index and vest at the end of a three-year performance period. The fair value of performance-based PSUs, restricted stock units (RSUs) and restricted stock is equal to the closing price of our stock on the business day immediately preceding the grant date. Compensation expense related to unvested performance-based PSUs will be recognized over the requisite service period of three years as the achievement of the performance obligation becomes probable. Management will continue to assess the assumptions and methodologies used to calculate the estimated fair value of stock-based compensation. Circumstances may change and additional data may become available over time, which could result in changes to these assumptions and methodologies and thereby materially impact our fair value determination. If factors change in future periods, the compensation expense that we record may differ significantly from what we have recorded in the current period.



## Business Combinations

The Company records assets acquired, liabilities assumed, contractual contingencies, when applicable, and intangible assets recognized as part of business combinations based on their fair values on the date of acquisition. The excess of the purchase price over the estimated fair values of the net tangible and intangible assets acquired is recorded as goodwill. If the estimated fair values of net tangible and intangible assets acquired exceed the purchase price, a bargain purchase gain is recorded. The Company's estimates of fair value are based on historical experience, industry knowledge, certain information obtained from the management of the acquired company and, in some cases, valuations performed by independent third-party firms. The results of operations of acquired companies are included in the accompanying condensed consolidated statements of operations since their dates of acquisition. Costs incurred to complete the business combination, such as legal, accounting, or other professional fees, are charged to general and administrative expenses as they are incurred.

## Goodwill

Goodwill represents the excess purchase price over the fair value of net assets acquired. We evaluate the carrying value of goodwill during the fourth quarter of each year and between annual evaluations if events occur or circumstances change that would more likely than not reduce the fair value of the reporting unit below its carrying amount. We have elected to first assess the qualitative factors to determine whether it is more likely than not that the fair value of the reporting unit to which the goodwill is assigned is less than its carrying amount as a basis for determining whether it is necessary to perform the two-step impairment test. If we determine that it is more likely than not that its fair value is less than its carrying amount, then the two-step impairment test will be performed. Based on the results of our qualitative assessment in 2018, we concluded that it was not necessary to perform the two-step impairment test. There were no impairment losses on goodwill recognized during the years ended December 31, 2018, 2017 and 2016.

## Income Taxes

We estimate our income tax provision or benefit in each of the jurisdictions in which we operate, including estimating exposures related to examinations by taxing authorities. We also make judgments regarding the realization of deferred tax assets, and establish valuation allowances where we believe it is more likely than not that future taxable income in certain jurisdictions will be insufficient to realize these deferred tax assets. Our estimates regarding future taxable income and income tax provision or benefit may vary due to changes in market conditions, changes in tax laws, or other factors. If our assumptions, and consequently our estimates, change in the future, the valuation allowances we have established may be increased or decreased, impacting future income tax expense. At December 31, 2018 and 2017, the Company had federal and state net operating loss carryforwards of \$16.1 million and \$2.8 million, respectively. These carryforwards are the result of acquisitions in 2011 and 2018 and domestic operating losses in 2018. A valuation allowance of \$0.1 million has been established against these losses as losses in a particular state may not be recognized. At December 31, 2018 and 2017, the Company had state tax credit carryforwards of \$3.7 million, which expire between 2019 and 2030. A valuation allowance of \$3.3 million and \$3.4 million, respectively, has been established against these credits. These state credits were generated primarily in a particular state where we no longer generate sufficient state income. In addition, at December 31, 2018 and 2017, the Company had foreign loss carryforwards of \$3.1 million. A majority of these loss carryforwards are the result of an acquisition in 2009. A valuation allowance of \$2.4 million and \$2.5 million, respectively, has been established against the net operating losses in a foreign jurisdiction where the Company has limited business. We believe it is more likely than not that we will not realize the full benefits of some of our deferred tax assets, and accordingly, we have provided a valuation allowance against that piece.

We establish reserves to remove some or all of the tax benefit of any of our tax positions at the time we determine that the positions become uncertain. We adjust these reserves, including any impact on the related interest and penalties, as facts and circumstances change.

## Liability for Warranty

Our products generally include warranties of 90 days to five years for product defects. We accrue for warranty returns at the time revenue is recognized based on our historical return rate and an estimate of the cost to repair or replace the defective products. We engage in extensive product quality programs and processes, including actively monitoring and evaluating the quality of our component suppliers. Our products continue to become more complex in both size and functionality as many of our product offerings migrate from line card applications to total systems. The increasing complexity of our products will cause warranty incidences, when they arise, to be more costly. Our estimates regarding future warranty obligations may change due to product failure rates, material usage, and other rework costs incurred in correcting a product failure. In addition, from time to time, specific warranty accruals may be recorded if unforeseen problems arise. Should our actual experience relative to these factors be worse than our estimates, we will be required to record additional warranty expense. Alternatively, if we provide for more reserves than we require, we will reverse a portion of such provisions in future periods. The liability for warranty obligations totaled \$8.6 million and \$9.7 million at December 31, 2018 and 2017, respectively. These liabilities are included in accrued expenses in the accompanying consolidated balance sheets.

## Pension Benefit Obligations

Pension benefit plan obligations are based on various assumptions used by our actuaries in calculating these amounts. These assumptions include discount rates, compensation rate increases, expected return on plan assets, retirement rates and mortality rates. Actual results that differ from the assumptions and changes in assumptions could affect future expenses and obligations. Our net pension liability totaled \$13.1 million and \$8.3 million at December 31, 2018 and 2017, respectively. This liability is included in other non-current liabilities in the accompanying consolidated balance sheets.

## Subsequent Events

On January 23, 2019, the Board declared a quarterly cash dividend of \$0.09 per common share to be paid to shareholders of record at the close of business on February 7, 2019. The quarterly dividend payment was \$4.3 million and was paid on February 21, 2019. In July 2003, our Board of Directors elected to begin declaring quarterly dividends on our common stock considering the tax treatment of dividends and adequate levels of Company liquidity.

During the first quarter and as of February 26, 2019, we have repurchased 13,000 shares of our common stock through open market purchases at an average cost of \$14.06 per share. We currently have the authority to purchase an additional 2.5 million shares of our common stock under the current plan approved by the Board of Directors.

In February 2019, \$1.0 million of an outstanding investment loan due to ADTRAN was replaced with a secured loan in that amount. The remaining balance of this investment loan was converted to participating preferred shares of the respective company.

In February 2019, we announced the restructuring of our workforce in Germany, which includes the closure of the office location in Munich, Germany accompanied by relocation or severance benefits for the affected employees and a voluntary early retirement offering to certain other employees. The restructuring is expected to be completed in the fourth quarter of 2019. ADTRAN does not have sufficient information currently on which to estimate the liability associated with this restructuring, including costs associated with employee severance and relocation.

On February 25, 2019, one of the Company's customers filed for voluntary Chapter 11 bankruptcy as a result of a court ruling resulting in a substantial legal judgment against the customer. In 2018, this customer accounted for less than 5% of the Company's revenue. As of December 31, 2018, the Company had \$2.6 million related to product and services revenue and \$0.3 million related to a leased equipment arrangement included in accounts receivable on the Consolidated Balance Sheet that was due from this customer. As of December 31, 2018, the Company had \$9.4 million included in other receivables related to a leased equipment arrangement on its Consolidated Balance Sheet that was due from this customer. Since December 31, 2018, and through the date of this filing, all \$2.6 million of the outstanding products and services accounts receivable and \$0.1 million of the outstanding accounts receivable related to leased equipment have been collected. Additionally, \$1.7 million of the outstanding other receivables related to leased equipment have been collected. Therefore, there is potential risk of uncollectibility up to \$7.8 million on the remaining outstanding receivable balances as of December 31, 2018. The Company has evaluated the collectibility of the remaining receivable balances with the best available and applicable information as of the date of this filing and the impact was not material to the consolidated financial statements as of December 31, 2018. The Company will continue to evaluate the collectibility of the remaining accounts receivable balances in subsequent reporting periods. Additionally, it is uncertain at this time the impact this voluntary bankruptcy filing might have on the Company's operating income prospectively; however, the Company believes it will not have a significant impact on the Company's liquidity and capital resources.

# Quantitative and Qualitative Disclosures About Market Risk

We are exposed to financial market risks, including changes in interest rates, foreign currency rates and prices of marketable equity and fixed-income securities. The primary objective of the large majority of our investment activities is to preserve principal while at the same time achieving appropriate yields without significantly increasing risk. To achieve this objective, a majority of our marketable securities are investment grade, fixed-rate bonds and municipal money market instruments denominated in U.S. dollars. Our investment policy provides limitations for issuer concentration, which limits, at the time of purchase, the concentration in any one issuer to 5% of the market value of our total investment portfolio.

We maintain depository investments with certain financial institutions. Although these depository investments may exceed government insured depository limits, we have evaluated the credit-worthiness of these financial institutions, and determined the risk of material financial loss due to exposure of such credit risk to be minimal. As of December 31, 2018, \$102.2 million of our cash and cash equivalents, primarily certain domestic money market funds and foreign depository accounts, were in excess of government provided insured depository limits.

As of December 31, 2018, approximately \$42.9 million of our cash and investments may be directly affected by changes in interest rates. We have performed a hypothetical sensitivity analysis assuming market interest rates increase or decrease by 50 basis points (bps) for an entire year, while all other variables remain constant. At December 31, 2018, we held \$5.7 million of cash and variable-rate investments where a change in interest rates would impact our interest income. A hypothetical 50 bps decline in interest rates as of December 31, 2018, would reduce annualized interest income on our cash and investments by approximately \$0.1 million. In addition, we held \$37.2 million of fixed-rate bonds whose fair values may be directly affected by a change in interest rates. A hypothetical 50 bps increase in interest rates as of December 31, 2018 would reduce the fair value of our fixed-rate bonds by approximately \$0.3 million.

We are exposed to changes in foreign currency exchange rates to the extent that such changes affect our revenue and gross margin on revenue derived from some international customers, expenses, and assets and liabilities held in non-functional currencies related to our foreign subsidiaries. Our primary exposures to foreign currency exchange rate movements are with our German subsidiary, whose functional currency is the Euro, our Australian subsidiary, whose functional currency is the Australian dollar, and our Mexican subsidiary, whose functional currency is the U.S. dollar. We are exposed to changes in foreign currency exchange rates to the extent of our German subsidiary's use of contract manufacturers and raw material suppliers whom we predominantly pay in U.S. dollars. As a result, changes in currency exchange rates could cause variations in gross margin in the products that we sell in the EMEA region.

We have certain international customers who are invoiced or pay in a non-functional currency. Changes in the monetary exchange rates used to invoice such customers versus the functional currency of the entity billing such customers may adversely affect our results of operations and financial condition. To manage the volatility relating to these typical business exposures, we may enter into various derivative transactions, when appropriate. We do not hold or issue derivative instruments for trading or other speculative purposes. All non-functional currencies billed would result in a combined hypothetical gain or loss of \$2.1 million if the U.S. dollar weakened or strengthened 10% against the billing currencies. This increase in this fluctuation compared to prior periods is mainly due to an increase in U.S. dollar-denominated billings in a non-U.S. dollar denominated subsidiary as well as an increase in international sales. Although we do not currently hold any derivative instruments, any gain or loss would be partially mitigated by any derivative instruments held.

As of December 31, 2018, we had no material contracts subject to currency revaluation, other than accounts receivable and accounts payable denominated in foreign currencies. As of December 31, 2018, we had no forward contracts outstanding.

For further information about the fair value of our available-for-sale investments and our derivative and hedging activities as of December 31, 2018, see Notes 5 and 6 of Notes to Consolidated Financial Statements included in Item 8 of this report.

# Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of ADTRAN, Inc.:

## **Opinions on the Financial Statements and Internal Control over Financial Reporting**

We have audited the accompanying consolidated balance sheets of ADTRAN, Inc. and its subsidiaries (the “Company”) as of December 31, 2018 and 2017, and the related consolidated statements of income, comprehensive income, changes in stockholders’ equity and cash flows for each of the three years in the period ended December 31, 2018, including the related notes and financial statement schedule listed in the accompanying index (collectively referred to as the “consolidated financial statements”). We also have audited the Company’s internal control over financial reporting as of December 31, 2018, 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, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018 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, 2018, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the COSO.

## **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 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.



PricewaterhouseCoopers LLP  
Birmingham, Alabama  
February 28, 2019

We have served as the Company's auditor since 1986.

# Financial Statements

## ADTRAN, INC.

### Consolidated Balance Sheets

(In thousands, except per share amounts)

December 31, 2018 and 2017

Assets	2018	2017
<b>Current Assets</b>		
Cash and cash equivalents	\$105,504	\$86,433
Short-term investments	3,246	16,129
Accounts receivable, less allowance for doubtful accounts of \$128 and \$— at December 31, 2018 and 2017, respectively	99,385	144,150
Other receivables	36,699	26,578
Inventory, net	99,848	122,542
Prepaid expenses and other current assets	10,744	17,282
<b>Total Current Assets</b>	<b>355,426</b>	<b>413,114</b>
Property, plant and equipment, net	80,635	85,079
Deferred tax assets, net	37,187	23,428
Goodwill	7,106	3,492
Intangibles, net	33,183	4,661
Other assets	5,668	9,064
Long-term investments	108,822	130,256
<b>Total Assets</b>	<b>\$628,027</b>	<b>\$669,094</b>
<b>Liabilities and Stockholders' Equity</b>		
<b>Current Liabilities</b>		
Accounts payable	\$61,054	\$60,632
Unearned revenue	17,940	13,070
Accrued expenses	11,746	13,232
Accrued wages and benefits	14,752	15,948
Income tax payable	12,518	3,936
<b>Total Current Liabilities</b>	<b>118,010</b>	<b>106,818</b>
Non-current unearned revenue	5,296	4,556
Other non-current liabilities	33,842	34,209
Bonds payable	24,600	25,600
<b>Total Liabilities</b>	<b>181,748</b>	<b>171,183</b>
Commitments and contingencies (see Note 15)		
<b>Stockholders' Equity</b>		
Common stock, par value \$0.01 per share; 200,000 shares authorized; 79,652 shares issued and 47,751 shares outstanding at December 31, 2018 and 79,652 shares issued and 48,485 shares outstanding at December 31, 2017	797	797
Additional paid-in capital	267,670	260,515
Accumulated other comprehensive loss	(14,416)	(3,295)
Retained earnings	883,975	922,178
Less treasury stock at cost: 31,901 and 31,167 shares at December 31, 2018 and 2017, respectively	(691,747)	(682,284)
<b>Total Stockholders' Equity</b>	<b>446,279</b>	<b>497,911</b>
<b>Total Liabilities and Stockholders' Equity</b>	<b>\$628,027</b>	<b>\$669,094</b>

See accompanying notes to consolidated financial statements.

**ADTRAN, INC.****Consolidated Statements of Income (Loss)***(In thousands, except per share amounts)*

Years ended December 31, 2018, 2017 and 2016

	2018	2017	2016
<b>Sales</b>			
Products	\$458,232	\$540,396	\$525,502
Services	71,045	126,504	111,279
<b>Total Sales</b>	<b>529,277</b>	<b>666,900</b>	<b>636,781</b>
<b>Cost of Sales</b>			
Products	278,929	279,563	270,705
Services	46,783	83,702	74,746
<b>Total Cost of Sales</b>	<b>325,712</b>	<b>363,265</b>	<b>345,451</b>
<b>Gross Profit</b>	<b>203,565</b>	<b>303,635</b>	<b>291,330</b>
Selling, general and administrative expenses	124,440	135,583	131,848
Research and development expenses	124,547	130,666	124,909
<b>Operating Income (Loss)</b>	<b>(45,422)</b>	<b>37,386</b>	<b>34,573</b>
Interest and dividend income	4,026	4,380	3,918
Interest expense	(533)	(556)	(572)
Net investment gain (loss)	(4,050)	4,685	5,923
Other income (expense), net	1,286	(1,208)	(489)
Gain on bargain purchase of a business	11,322	—	3,542
<b>Income (loss) before (provision) benefit for income taxes</b>	<b>(33,371)</b>	<b>44,687</b>	<b>46,895</b>
(Provision) benefit for income taxes	14,029	(20,847)	(11,666)
<b>Net Income (Loss)</b>	<b>\$(19,342)</b>	<b>\$23,840</b>	<b>\$35,229</b>
Weighted average shares outstanding—basic	47,880	48,153	48,724
Weighted average shares outstanding—diluted	47,880	48,699	48,949
Earnings (loss) per common share—basic	\$(0.40)	\$0.50	\$0.72
Earnings (loss) per common share—diluted	\$(0.40)	\$0.49	\$0.72

*See accompanying notes to consolidated financial statements.*

**ADTRAN, INC.****Consolidated Statements of Comprehensive Income (Loss)***(In thousands)*

Years ended December 31, 2018, 2017 and 2016

	2018	2017	2016
<b>Net Income (Loss)</b>	<b>\$(19,342)</b>	<b>\$23,840</b>	<b>\$35,229</b>
Other Comprehensive Income (Loss), net of tax:			
Net unrealized gains (losses) on available-for-sale securities	(3,130)	2,163	(1,528)
Defined benefit plan adjustments	(3,755)	731	(1,122)
Foreign currency translation	(4,236)	5,999	(569)
<b>Other Comprehensive Income (Loss), net of tax</b>	<b>(11,121)</b>	<b>8,893</b>	<b>(3,219)</b>
<b>Comprehensive Income (Loss), net of tax</b>	<b>\$(30,463)</b>	<b>\$32,733</b>	<b>\$32,010</b>

*See accompanying notes to consolidated financial statements.*



**ADTRAN, INC.**
**Consolidated Statements of Changes in Stockholders' Equity**
*(In thousands)*

Years ended December 31, 2018, 2017 and 2016

	Common Shares	Common Stock	Additional Paid-In Capital	Retained Earnings	Treasury Stock	Accumulated Other Comprehensive Loss	Total Stockholders' Equity
<b>Balance, December 31, 2015</b>	<b>79,652</b>	<b>\$797</b>	<b>\$246,879</b>	<b>\$906,772</b>	<b>\$(665,319)</b>	<b>\$(8,969)</b>	<b>\$480,160</b>
Net income				35,229			35,229
Other comprehensive loss, net of tax						(3,219)	(3,219)
Dividend payments				(17,583)			(17,583)
Dividends accrued on unvested restricted stock units				(48)			(48)
Stock options exercised: 283 shares				(1,499)	6,216		4,717
PSUs, RSUs and restricted stock vested: 42 shares			(142)	(929)	929		(142)
Purchase of treasury stock: 1,411 shares					(25,817)		(25,817)
Income tax effect of stock compensation arrangements			(475)				(475)
Stock-based compensation expense			6,695				6,695
<b>Balance, December 31, 2016</b>	<b>79,652</b>	<b>797</b>	<b>252,957</b>	<b>921,942</b>	<b>(683,991)</b>	<b>(12,188)</b>	<b>479,517</b>
Net income				23,840			23,840
Other comprehensive income, net of tax						8,893	8,893
Dividend payments				(17,368)			(17,368)
Dividends accrued on unvested restricted stock units				(37)			(37)
Stock options exercised: 742 shares				(2,827)	16,239		13,412
PSUs, RSUs and restricted stock vested: 154 shares				(3,257)	2,816		(441)
Purchase of treasury stock: 856 shares					(17,348)		(17,348)
Stock-based compensation expense			7,433				7,433
ASU 2016-09 adoption (see Note 1)			125	(115)			10
<b>Balance, December 31, 2017</b>	<b>79,652</b>	<b>797</b>	<b>260,515</b>	<b>922,178</b>	<b>(682,284)</b>	<b>(3,295)</b>	<b>497,911</b>
Net loss				(19,342)			(19,342)
ASU 2014-09 adoption (see Note 1)				278			278
ASU 2016-01 adoption (see Note 1)				3,220			3,220
Other comprehensive loss, net of tax						(11,121)	(11,121)
Dividend payments				(17,267)			(17,267)
Dividends accrued on unvested restricted stock units				(7)			(7)
Stock options exercised: 96 shares				(603)	2,086		1,483
PSUs, RSUs and restricted stock vested: 217 shares				(4,482)	3,983		(499)
Purchase of treasury stock: 1,001 shares					(15,532)		(15,532)
Stock-based compensation expense			7,155				7,155
<b>Balance, December 31, 2018</b>	<b>79,652</b>	<b>\$797</b>	<b>\$267,670</b>	<b>\$883,975</b>	<b>\$(691,747)</b>	<b>\$(14,416)</b>	<b>\$446,279</b>

See accompanying notes to consolidated financial statements.

**ADTRAN, INC.****Consolidated Statements of Cash Flows***(In thousands)*

Years ended December 31, 2018, 2017 and 2016

	2018	2017	2016
<b>Cash flows from operating activities</b>			
Net income (loss)	\$(19,342)	\$23,840	\$35,229
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	15,891	15,692	14,407
Amortization of net premium (discount) on available-for-sale investments	(50)	425	643
Net (gain) loss on long-term investments	4,050	(4,685)	(5,923)
Net (gain) loss on disposal of property, plant and equipment	67	(145)	22
Gain on bargain purchase of a business	(11,322)	—	(3,542)
Stock-based compensation expense	7,155	7,433	6,695
Deferred income taxes	(17,257)	14,073	(2,685)
Change in operating assets and liabilities:			
Accounts receivable, net	49,200	(49,103)	(21,302)
Other receivables	(8,522)	(10,222)	4,101
Inventory	24,192	(15,518)	(10,887)
Prepaid expenses and other assets	10,727	(4,830)	(7,108)
Accounts payable	(3,799)	(17,742)	26,722
Accrued expenses and other liabilities	(3,226)	(5,455)	8,792
Income taxes payable	7,690	3,858	(3,162)
<b>Net cash provided by (used in) operating activities</b>	<b>55,454</b>	<b>(42,379)</b>	<b>42,002</b>
<b>Cash flows from investing activities</b>			
Purchases of property, plant and equipment	(8,110)	(14,720)	(21,441)
Proceeds from disposals of property, plant and equipment	—	151	—
Proceeds from sales and maturities of available-for-sale investments	153,649	173,752	225,075
Purchases of available-for-sale investments	(123,209)	(93,141)	(209,172)
Acquisition of business, net of cash acquired	(22,045)	—	(943)
<b>Net cash provided by (used in) investing activities</b>	<b>285</b>	<b>66,042</b>	<b>(6,481)</b>
<b>Cash flows from financing activities</b>			
Proceeds from stock option exercises	1,483	13,412	4,717
Purchases of treasury stock	(15,532)	(17,348)	(25,817)
Dividend payments	(17,267)	(17,368)	(17,583)
Payments on long-term debt	(1,100)	(1,100)	(1,100)
<b>Net cash used in financing activities</b>	<b>(32,416)</b>	<b>(22,404)</b>	<b>(39,783)</b>
Net increase (decrease) in cash and cash equivalents	23,323	1,259	(4,262)
Effect of exchange rate changes	(4,252)	5,279	(393)
<b>Cash and cash equivalents, beginning of year</b>	<b>86,433</b>	<b>79,895</b>	<b>84,550</b>
<b>Cash and cash equivalents, end of year</b>	<b>\$105,504</b>	<b>\$86,433</b>	<b>\$79,895</b>
Supplemental disclosure of cash flow information			
Cash paid during the year for interest	\$534	\$555	\$575
Cash paid during the year for income taxes	\$4,104	\$2,988	\$18,689
Supplemental disclosure of non-cash investing activities			
Purchases of property, plant and equipment included in accounts payable	\$62	\$408	\$2,103
Contingent payments	\$1,230	\$—	\$—

See accompanying notes to consolidated financial statements.

# Notes to Consolidated Financial Statements

## **Note 1 – Nature of Business and Summary of Significant Accounting Policies**

At ADTRAN, Inc., we believe amazing things happen when people connect. From the cloud edge to the subscriber edge, we help service providers around the world manage and scale services that connect people, places and things to advance human progress. Whether rural or urban, domestic or international, telco or cable, enterprise or residential—ADTRAN solutions optimize existing technology infrastructures and create new, multi-gigabit platforms that leverage cloud economics, data analytics, machine learning and open ecosystems—the future of global networking.

### **Principles of Consolidation**

The consolidated financial statements include ADTRAN and its wholly-owned subsidiaries. All intercompany accounts and transactions have been eliminated in consolidation.

### **Use of Estimates**

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America (U.S. GAAP) requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenue and expense during the reporting period. Our more significant estimates include obsolete and excess inventory reserves, warranty reserves, customer rebates, determination and accrual of the deferred revenue components of multiple element sales agreements, estimated costs to complete obligations associated with deferred revenues and network installations, estimated income tax provision and income tax contingencies, fair value of stock-based compensation, impairment of goodwill, valuation and estimated lives of intangible assets, estimated pension liability, fair value of investments, and evaluation of other-than-temporary declines in the value of investments. Actual amounts could differ significantly from these estimates.

### **Cash and Cash Equivalents**

Cash and cash equivalents represent demand deposits, money market funds, and short-term investments classified as available-for-sale with original maturities of three months or less. We maintain depository investments with certain financial institutions. Although these depository investments may exceed government insured depository limits, we have evaluated the credit worthiness of these applicable financial institutions, and determined the risk of material financial loss due to the exposure of such credit risk to be minimal. As of December 31, 2018, \$102.2 million of our cash and cash equivalents, primarily certain domestic money market funds and foreign depository accounts, were in excess of government provided insured depository limits.

### **Financial Instruments**

The carrying amounts reported in the consolidated balance sheets for cash and cash equivalents, accounts receivable, and accounts payable approximate fair value due to the immediate or short-term maturity of these financial instruments. The carrying amount reported for bonds payable was \$25.6 million, compared to an estimated fair value of \$25.4 million, based on a debt security with a comparable interest rate and maturity and a Standard & Poor's credit rating of AAA.

Investments with contractual maturities beyond one year may be classified as short-term based on their highly liquid nature and because such marketable securities represent the investment of cash that is available for current operations. Despite the long-term nature of their stated contractual maturities, we routinely buy and sell these securities and we believe we have the ability to quickly sell them to the remarketing agent, tender agent, or issuer at par value plus accrued interest in the event we decide to liquidate our investment in a particular variable rate demand note. All income generated from these investments was recorded as interest income. We have not been required to record any losses relating to variable rate demand notes.

Long-term investments represent a restricted certificate of deposit held at cost, deferred compensation plan assets, corporate bonds, municipal fixed-rate bonds, asset-backed bonds, mortgage/agency-backed bonds, U.S. and foreign government bonds, marketable equity securities and other equity investments. Marketable equity securities are reported at fair value as determined by the most recently traded price of the securities at the balance sheet date, although the securities may not be readily marketable due to the size of the available market. Any changes in fair value are recognized in net investment gain (loss). Realized gains and losses on sales of debt securities are computed under the specific identification method and are included in current income. See Note 5 of Notes to Consolidated Financial Statements for additional information.

### **Accounts Receivable**

We record accounts receivable at net realizable value. Prior to establishing payment terms for a new customer, we evaluate the credit risk of the customer. Credit limits and payment terms established for new customers are re-evaluated periodically based on customer collection experience and other financial factors. At December 31, 2018, single customers comprising more than 10% of our total accounts receivable balance included three customers, which accounted for 45.8% of our total accounts receivable. As of December 31, 2017, single customers comprising more than 10% of our total accounts receivable balance included two customers, which accounted for 63.8% of our total accounts receivable.

We regularly review the need to maintain an allowance for doubtful accounts and consider factors such as the age of accounts receivable balances, the current economic conditions that may affect a customer's ability to pay, significant one-time events and our historical experience. If the financial condition of a customer deteriorates, resulting in an impairment of their ability to make payments, we may be required to record an allowance for doubtful accounts. If circumstances change with regard to individual receivable balances that have previously been determined to be uncollectible (and for which a specific reserve has been established), a reduction in our allowance for doubtful accounts may be required. Our allowance for doubtful accounts was \$0.1 million and zero as of December 31, 2018, and December 31, 2017, respectively.

### **Other Receivables**

Other receivables are comprised primarily of lease receivables, amounts due from subcontract manufacturers for product component transfers, unbilled receivables, investment loan, amounts due from various jurisdictions for value-added tax, and income tax receivable.

### **Inventory**

Inventory is carried at the lower of cost and net realizable value, with cost being determined using the first-in, first-out method. Standard costs for material, labor and manufacturing overhead are used to value inventory. Standard costs are updated at least quarterly; therefore, inventory costs approximate actual costs at the end of each reporting period. We establish reserves for estimated excess, obsolete or unmarketable inventory equal to the difference between the cost of the inventory and the estimated fair value of the inventory based upon assumptions about future demand, market conditions and life. When we dispose of excess and obsolete inventories, the related disposals are charged against the inventory reserve. See Note 7 of Notes to Consolidated Financial Statements for additional information.

### **Property, Plant and Equipment**

Property, plant and equipment, which is stated at cost, is depreciated using the straight-line method over the estimated useful lives of the assets. We depreciate building and land improvements from five to 39 years, office machinery and equipment from three to seven years, engineering machinery and equipment from three to seven years, and computer software from three to five years. Expenditures for repairs and maintenance are charged to expense as incurred. Major improvements that materially prolong the lives of the assets are capitalized. Gains and losses on the disposal of property, plant and equipment are recorded in operating income. See Note 8 of Notes to Consolidated Financial Statements for additional information.

### **Intangible Assets**

Purchased intangible assets with finite lives are carried at cost, less accumulated amortization. Amortization is recorded over the estimated useful lives of the respective assets, which is two to 14 years. See Note 10 of Notes to Consolidated Financial Statements for additional information.

### **Impairment of Long-Lived Assets and Intangibles**

We review long-lived assets used in operations and intangible assets for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable and the undiscounted cash flows estimated to be generated by the asset are less than the asset's carrying value. An impairment loss would be recognized in the amount by which the recorded value of the asset exceeds the fair value of the asset, measured by the quoted market price of an asset or an estimate based on the best information available in the circumstances. There were no impairment losses for long-lived assets or intangible assets recognized during the years ended December 31, 2018, 2017 or 2016.

### **Goodwill**

Goodwill represents the excess purchase price over the fair value of net assets acquired. We evaluate the carrying value of goodwill during the fourth quarter of each year and between annual evaluations if events occur or circumstances change that would more likely than not reduce the fair value of the reporting unit below its carrying amount. We have elected to first assess the qualitative factors to determine whether it is more likely than not that the fair value of the reporting unit to which

the goodwill is assigned is less than its carrying amount as a basis for determining whether it is necessary to perform the two-step impairment test. If we determine that it is more likely than not that its fair value is less than its carrying amount, then the two-step impairment test will be performed. Based on the results of our qualitative assessment in 2018, we concluded that it was not necessary to perform the two-step impairment test. There were no impairment losses on goodwill recognized during the years ended December 31, 2018, 2017 and 2016.

### Liability for Warranty

Our products generally include warranties of 90 days to five years for product defects. We accrue for warranty returns at the time revenue is recognized based on our historical return rate and estimate of the cost to repair or replace the defective products. We engage in extensive product quality programs and processes, including actively monitoring and evaluating the quality of our component suppliers. Our products continue to become more complex in both size and functionality as many of our product offerings migrate from line card applications to total systems. The increasing complexity of our products will cause warranty incidences, when they arise, to be more costly. Our estimates regarding future warranty obligations may change due to product failure rates, material usage, and other rework costs incurred in correcting a product failure. In addition, from time to time, specific warranty accruals may be recorded if unforeseen problems arise. Should our actual experience relative to these factors be worse than our estimates, we will be required to record additional warranty expense. Alternatively, if we provide for more reserves than we require, we will reverse a portion of such provisions in future periods. The liability for warranty obligations totaled \$8.6 million and \$9.7 million as of December 31, 2018 and 2017, respectively. These liabilities are included in accrued expenses in the accompanying consolidated balance sheets. During 2017, we recorded a reduction in warranty expense related to a settlement with a third party supplier for a defective component, the impact of which is reflected in the following table.

A summary of warranty expense and write-off activity for the years ended December 31, 2018, 2017 and 2016 is as follows:

*(In thousands)*

Year Ended December 31,	2018	2017	2016
Balance at beginning of period	\$9,724	\$8,548	\$8,739
Plus: Amounts charged to cost and expenses	7,392	6,951	8,561
Less: Deductions	(8,493)	(5,775)	(8,752)
<b>Balance at end of period</b>	<b>\$8,623</b>	<b>\$9,724</b>	<b>\$8,548</b>

### Pension Benefit Plan Obligations

We maintain a defined benefit pension plan covering employees in certain foreign countries. Pension benefit plan obligations are based on various assumptions used by our actuaries in calculating these amounts. These assumptions include discount rates, compensation rate increases, expected return on plan assets, retirement rates and mortality rates. Actual results that differ from the assumptions and changes in assumptions could affect future expenses and obligations. Our net pension liability totaled \$13.1 million and \$8.3 million at December 31, 2018 and 2017, respectively. This liability is included in other non-current liabilities in the accompanying consolidated balance sheets.

### Stock-Based Compensation

We have two Board and stockholder-approved stock incentive plans from which stock options, performance stock units (PSUs), restricted stock units (RSUs) and restricted stock are available for grant to employees and directors. All employee and director stock options granted under our stock option plans have an exercise price equal to the fair market value of the award, as defined in the plan, of the underlying common stock on the grant date. All of our outstanding stock option awards are classified as equity awards.

Stock-based compensation expense recognized for the years ended December 31, 2018, 2017 and 2016 was approximately \$7.2 million, \$7.4 million and \$6.7 million, respectively. As of December 31, 2018, total compensation cost related to non-vested stock options, PSUs, RSUs and restricted stock not yet recognized was approximately \$18.6 million, which is expected to be recognized over an average remaining recognition period of 2.9 years. In addition, there was \$9.1 million of unrecognized compensation expense related to unvested 2017 performance-based PSUs, which will be recognized over the remaining requisite service period if achievement of the performance obligation becomes probable. See Note 4 of Notes to Consolidated Financial Statements for additional information.

### Research and Development Costs

Research and development costs include compensation for engineers and support personnel, outside contracted services, depreciation and material costs associated with new product development, enhancement of current products and product cost reductions. We continually evaluate new product opportunities and engage in intensive research and product development efforts. Research and development costs totaled \$124.5 million, \$130.7 million and \$124.9 million for the years ended December 31, 2018, 2017 and 2016, respectively.

### Other Comprehensive Income

Other comprehensive income consists of unrealized gains (losses) on available-for-sale debt securities, unrealized gains (losses) on cash flow hedges, reclassification adjustments for amounts included in net income related to impairments of available-for-sale securities, realized gains (losses) on debt securities, realized gains (losses) on cash flow hedges, and amortization of actuarial gains (losses) related to our defined benefit plan, defined benefit plan adjustments, and foreign currency translation adjustments.

The following table presents changes in accumulated other comprehensive income, net of tax, by component for the years ended December 31, 2018, 2017 and 2016:

<i>(In thousands)</i>	Unrealized Gains (Losses) on Available-for-Sale Securities	Unrealized Gains (Losses) on Cash Flow Hedges	Defined Benefit Plan Adjustments	Foreign Currency Adjustments	Total
<b>Balance at December 31, 2015</b>	<b>\$1,932</b>	<b>\$ —</b>	<b>\$(3,895)</b>	<b>\$(7,006)</b>	<b>\$(8,969)</b>
Other comprehensive income (loss) before reclassifications	1,515	—	(1,229)	(569)	(283)
Amounts reclassified from accumulated other comprehensive income	(3,043)	—	107	—	(2,936)
<b>Balance at December 31, 2016</b>	<b>404</b>	<b>—</b>	<b>(5,017)</b>	<b>(7,575)</b>	<b>(12,188)</b>
Other comprehensive income (loss) before reclassifications	5,020	(619)	451	5,999	10,851
Amounts reclassified from accumulated other comprehensive income	(2,857)	619	280	—	(1,958)
<b>Balance at December 31, 2017</b>	<b>2,567</b>	<b>—</b>	<b>(4,286)</b>	<b>(1,576)</b>	<b>(3,295)</b>
Other comprehensive income (loss) before reclassifications	685	—	(3,890)	(4,236)	(7,441)
Amounts reclassified to retained earnings <sup>(1)</sup>	(3,220)	—	—	—	(3,220)
Amounts reclassified from accumulated other comprehensive income	(595)	—	135	—	(460)
<b>Balance at December 31, 2018</b>	<b>\$(563)</b>	<b>—</b>	<b>\$(8,041)</b>	<b>\$(5,812)</b>	<b>\$(14,416)</b>

<sup>(1)</sup> With the adoption of ASU 2016-01, the unrealized gains on our equity investments were reclassified to retained earnings. See Recently Issued Accounting Standards later in Note 1 for more information.

The following tables present the details of reclassifications out of accumulated other comprehensive income for the years ended December 31, 2018, 2017 and 2016:

<i>(In thousands)</i>	<b>2018</b>	
Details about Accumulated Other Comprehensive Loss Components	Amount Reclassified from Accumulated Other Comprehensive Income	Affected Line Item in the Statement Where Net Income Is Presented
Unrealized gains on available-for-sale securities:		
Net realized gain on sales of securities	\$804	Net investment gain (loss)
Defined benefit plan adjustments – actuarial losses	(196)	<sup>(1)</sup>
Total reclassifications for the period, before tax	608	
Tax expense	(148)	
<b>Total reclassifications for the period, net of tax</b>	<b>\$460</b>	

<sup>(1)</sup> Included in the computation of net periodic pension cost. See Note 13 of Notes to Consolidated Financial Statements.

<i>(In thousands)</i>	<b>2017</b>	
Details about Accumulated Other Comprehensive Loss Components	Amount Reclassified from Accumulated Other Comprehensive Income	Affected Line Item in the Statement Where Net Income Is Presented
Unrealized gains (losses) on available-for-sale securities:		
Net realized gain on sales of securities	\$4,864	Net investment gain (loss)
Impairment expense	(180)	Net investment gain (loss)
Net losses on derivatives designated as hedging instruments	(897)	Cost of sales
Defined benefit plan adjustments – actuarial losses	(406)	<sup>(1)</sup>
Total reclassifications for the period, before tax	3,381	
Tax expense	(1,423)	
<b>Total reclassifications for the period, net of tax</b>	<b>\$1,958</b>	

<sup>(1)</sup> Included in the computation of net periodic pension cost. See Note 13 of Notes to Consolidated Financial Statements.

<i>(In thousands)</i>	<b>2016</b>	
Details about Accumulated Other Comprehensive Income Components	Amount Reclassified from Accumulated Other Comprehensive Income	Affected Line Item in the Statement Where Net Income Is Presented
Unrealized gains (losses) on available-for-sale securities:		
Net realized gain on sales of securities	\$5,408	Net investment gain (loss)
Impairment expense	(419)	Net investment gain (loss)
Defined benefit plan adjustments – actuarial losses	(156)	<sup>(1)</sup>
Total reclassifications for the period, before tax	4,833	
Tax expense	(1,897)	
<b>Total reclassifications for the period, net of tax</b>	<b>\$2,936</b>	

<sup>(1)</sup> Included in the computation of net periodic pension cost. See Note 13 of Notes to Consolidated Financial Statements.

The following tables present the tax effects related to the change in each component of other comprehensive income for the years ended December 31, 2018, 2017 and 2016:

	2018		
<i>(In thousands)</i>	Before-Tax Amount	Tax (Expense) Benefit	Net-of-Tax Amount
Unrealized gains (losses) on available-for-sale securities	\$926	\$(241)	\$685
Reclassification adjustment for amounts related to available-for-sale investments included in net loss	(804)	209	(595)
Reclassification adjustment for amounts reclassified to retained earnings related to the adoption of ASU 2016-01	(4,351)	1,131	(3,220)
Defined benefit plan adjustments	(5,638)	1,748	(3,890)
Reclassification adjustment for amounts related to defined benefit plan adjustments included in net loss	196	(61)	135
Foreign currency translation adjustment	(4,236)	—	(4,236)
<b>Total Other Comprehensive Income (Loss)</b>	<b>\$(13,907)</b>	<b>\$2,786</b>	<b>\$(11,121)</b>

	2017		
<i>(In thousands)</i>	Before-Tax Amount	Tax (Expense) Benefit	Net-of-Tax Amount
Unrealized gains (losses) on available-for-sale securities	\$8,230	\$(3,210)	\$5,020
Reclassification adjustment for amounts related to available-for-sale investments included in net income	(4,684)	1,827	(2,857)
Unrealized gains (losses) on cash flow hedges	(897)	278	(619)
Reclassification adjustment for amounts related to cash flow hedges included in net income	897	(278)	619
Defined benefit plan adjustments	654	(203)	451
Reclassification adjustment for amounts related to defined benefit plan adjustments included in net income	406	(126)	280
Foreign currency translation adjustment	5,999	—	5,999
<b>Total Other Comprehensive Income (Loss)</b>	<b>\$10,605</b>	<b>\$(1,712)</b>	<b>\$8,893</b>

	2016		
<i>(In thousands)</i>	Before-Tax Amount	Tax (Expense) Benefit	Net-of-Tax Amount
Unrealized gains (losses) on available-for-sale securities	\$2,484	\$(969)	\$1,515
Reclassification adjustment for amounts related to available-for-sale investments included in net income	(4,989)	1,946	(3,043)
Defined benefit plan adjustments	(1,782)	553	(1,229)
Reclassification adjustment for amounts related to defined benefit plan adjustments included in net income	156	(49)	107
Foreign currency translation adjustment	(569)	—	(569)
<b>Total Other Comprehensive Income (Loss)</b>	<b>\$(4,700)</b>	<b>\$1,481</b>	<b>\$(3,219)</b>

#### Income Taxes

The provision for income taxes has been determined using the asset and liability approach of accounting for income taxes. Under this approach, deferred taxes represent the future tax consequences expected to occur when the reported amounts of assets and liabilities are recovered or paid. The provision for income taxes represents income taxes paid or payable for the current year plus the change in deferred taxes during the year. Deferred taxes result from the difference between financial and tax bases of our assets and liabilities and are adjusted for changes in tax rates and tax laws when such changes are enacted. Valuation allowances are recorded to reduce deferred tax assets when it is more likely than not that a tax benefit will not be realized.



We establish reserves to remove some or all of the tax benefit of any of our tax positions at the time we determine that the positions become uncertain. We adjust these reserves, including any impact on the related interest and penalties, as facts and circumstances change.

On December 22, 2017, the Tax Cuts and Jobs Act (the Act) was signed into law. As a result of the Act, we recognized an estimated expense of \$11.9 million in the fourth quarter of 2017, of which \$9.2 million related to the write-down of deferred tax assets and \$2.7 million related to tax on unrepatriated foreign earnings. We calculated our best estimate of the impact of the Act in our 2017 year-end income tax provision, in accordance with Staff Accounting Bulletin No. 118, which was issued to address the application of U.S. GAAP in situations when a registrant does not have the necessary information available, prepared or analyzed to finalize the accounting for certain income tax effects of the Act. Additional work to complete a more detailed analysis of historical foreign earnings, as well as the full impact relating to the write-down of deferred tax assets, was completed in the third quarter of 2018 and resulted in a tax benefit of \$4.0 million.

### **Foreign Currency**

We record transactions denominated in foreign currencies on a monthly basis using exchange rates from throughout the year. Assets and liabilities denominated in foreign currencies are remeasured at the balance sheet dates using the closing rates of exchange between those foreign currencies and the functional currency with any transaction gains or losses reported in other income (expense). Our primary exposures to foreign currency exchange rate movements are with our German subsidiary, whose functional currency is the Euro, our Australian subsidiary, whose functional currency is the Australian dollar, and our Mexican subsidiary, whose functional currency is the U.S. dollar. Adjustments resulting from translating financial statements of international subsidiaries are recorded as a component of accumulated other comprehensive income (loss).

### **Revenue Recognition**

On January 1, 2018 we adopted ASU 2014-09, Revenue from Contracts with Customers (Topic 606), which supersedes the revenue recognition requirements in Topic 605, Revenue Recognition.

#### **Accounting Policy under Topic 606**

Revenue is measured based on the consideration we expect to receive in exchange for transferring goods or providing services to a customer and as performance obligations under the terms of the contract are satisfied. For transactions where there are multiple performance obligations, we account for individual products and services separately if they are distinct (if a product or service is separately identifiable from other items and if a customer can benefit from it on its own or with other resources that are readily available to the customer). The consideration, including any discounts, is allocated between separate products and services based on their stand-alone selling prices. Shipping fees are recorded as revenue and the related cost is included in cost of sales. Sales, value-added, and other taxes collected concurrently with revenue-producing activities are excluded from revenue. Costs of obtaining a contract are capitalized and amortized over the period that the related revenue is recognized if greater than one year. We have elected to apply the practical expedient related to the incremental costs of obtaining contracts and recognize those costs as an expense when incurred if the amortization period of the assets is one year or less. These costs are included in selling, general, and administrative expenses. Capitalized costs with an amortization period greater than one year were immaterial.

A portion of our products is sold to a non-exclusive distribution network of major technology distributors in the United States. These large organizations then distribute or provide fulfillment services to an extensive network of VARs and Sis. VARs and Sis may be affiliated with us as a channel partner, or they may purchase from the distributor in an unaffiliated fashion. Additionally, with certain limitations our distributors may return unused and unopened product for stock-balancing purposes when such returns are accompanied by offsetting orders for products of equal or greater value.

We participate in cooperative advertising and market development programs with certain customers. We use these programs to reimburse customers for certain forms of advertising, and in general, to allow our customers credits up to a specified percentage of their net purchases. Our costs associated with these programs are estimated and included in marketing expenses in our consolidated statements of income. We also participate in rebate programs to provide sales incentives for certain products. Our costs associated with these programs are estimated and accrued at the time of sale, and are recorded as a reduction of sales in our consolidated statements of income.

#### **Accounting Policy under Topic 605**

Revenue was generally recognized when persuasive evidence of an arrangement exists, delivery has occurred, the product price was fixed or determinable, collection of the resulting receivable was reasonably assured, and product returns were reasonably estimable. For product sales, revenue was generally recognized upon shipment of the product to our customer

in accordance with the title transfer terms of the sales agreement, generally Ex Works, per International Commercial Terms. In the case of consigned inventory, revenue was recognized when the end customer assumes ownership of the product. Contracts that contained multiple deliverables were evaluated to determine the units of accounting, and the consideration from the arrangement was allocated to each unit of accounting based on the relative selling price and corresponding terms of the contract. When this was not available, we were generally not able to determine third-party evidence of selling price because of the extent of customization among competing products or services from other companies. In these instances, we used best estimates to allocate consideration to each respective unit of accounting. These estimates included analysis of respective bills of material and review and analysis of similar product and service offerings. We recorded revenue associated with installation services when respective contractual obligations are complete. In instances where customer acceptance was required, revenue was deferred until respective acceptance criteria were met. Contracts that included both installation services and product sales were evaluated for revenue recognition in accordance with contract terms. As a result, installation services may have been considered a separate deliverable or may have been considered a combined single unit of accounting with the delivered product. Generally, either the purchaser, ADTRAN, or a third party would perform the installation of our products. Shipping fees were recorded as revenue and the related costs were included in cost of sales. Sales taxes invoiced to customers were included in revenues, and represented less than one percent of total revenues. The corresponding sales taxes paid were included in cost of goods sold. Value-added taxes collected from customers in international jurisdictions were recorded in accrued expenses as a liability. Revenue was recorded net of discounts. Sales returns were recorded as a reduction of revenue and accrued based on historical sales return experience, which we believed provided a reasonable estimate of future returns.

#### **Unearned Revenue**

Unearned revenue primarily represents customer billings on our maintenance service programs and leases and unearned revenues related to multiple element contracts where we still have contractual obligations to our customers. We currently offer maintenance contracts ranging from one month to five years. Revenue attributable to maintenance contracts is recognized on a straight-line basis over the related contract term. In addition, we provide software maintenance and a variety of hardware maintenance services to customers under contracts with terms up to ten years. When we defer revenue related to multiple-element contracts where we still have contractual obligations, we also defer the related costs. Current deferred costs are included in prepaid expenses and other assets and totaled \$2.4 million and \$11.4 million as of December 31, 2018 and 2017, respectively. Non-current deferred costs are included in other assets and totaled \$0.8 million and \$2.8 million as of December 31, 2018 and 2017, respectively.

#### **Other Income (Expense), Net**

Other income (expense), net, is comprised primarily of gains and losses on foreign currency transactions, net periodic pension costs, scrap raw material sales, investment account management fees, gains and losses on foreign exchange forward contracts and miscellaneous income and expense.

#### **Earnings (Loss) per Share**

Earnings (loss) per common share and earnings (loss) per common share assuming dilution, are based on the weighted average number of common shares and, when dilutive, common equivalent shares outstanding during the year. See Note 16 of Notes to Consolidated Financial Statements for additional information.

#### **Dividends**

During 2018, 2017 and 2016, we paid shareholder dividends totaling \$17.3 million, \$17.4 million and \$17.6 million, respectively. The Board of Directors presently anticipates that it will declare a regular quarterly dividend so long as the present tax treatment of dividends exists and adequate levels of liquidity are maintained. The following table shows dividends paid to our shareholders in each quarter of 2018, 2017 and 2016.

#### **Dividends per Common Share**

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
2018	\$0.09	\$0.09	\$0.09	\$0.09
2017	\$0.09	\$0.09	\$0.09	\$0.09
2016	\$0.09	\$0.09	\$0.09	\$0.09

On January 23, 2019, the Board of Directors declared a quarterly cash dividend of \$0.09 per common share to be paid to shareholders of record at the close of business on February 7, 2019. The ex-dividend date was February 6, 2019 and the payment date was February 21, 2019. The quarterly dividend payment was \$4.3 million.

### **Business Combinations**

The Company records assets acquired, liabilities assumed, contractual contingencies, when applicable, and intangible assets recognized as part of business combinations based on their fair values on the date of acquisition. The excess of the purchase price over the estimated fair values of the net tangible and intangible assets acquired is recorded as goodwill. If the estimated fair values of net tangible and intangible assets acquired exceed the purchase price, a bargain purchase gain is recorded. The Company's estimates of fair value are based on historical experience, industry knowledge, certain information obtained from the management of the acquired company and, in some cases, valuations performed by independent third-party firms. The results of operations of acquired companies are included in the accompanying condensed consolidated statements of operations since their dates of acquisition. Costs incurred to complete the business combination, such as legal, accounting, or other professional fees, are charged to general and administrative expenses as they are incurred.

### **Recently Issued Accounting Standards**

In February 2016, the Financial Accounting Standards Board (FASB) issued Accounting Standards Update (ASU) 2016-02, Leases (Topic 842). ASU 2016-02 requires an entity to recognize right-of-use assets and lease liabilities on the balance sheet and to disclose key information about the entity's leasing arrangements. In July 2018, the FASB issued ASU 2018-10, Codification Improvements to Topic 842, Leases, which clarified certain aspects of ASU 2016-02, as well as, ASU 2018-11, Leases (Topic 842), Targeted Improvements, which provides for an optional transition method that allows for the application of the legacy lease guidance, including its disclosure requirements, for the comparative periods presented in the year of adoption, with the cumulative effect of initially applying the new lease standard recognized as an adjustment to retained earnings as of the date of adoption. For lessors, the new leasing standard requires leases to be classified as a sales-type, direct financing or operating leases. These criteria focus on the transfer of control of the underlying lease asset. This standard and related updates are effective for fiscal years beginning after December 15, 2018, and interim periods within those fiscal years.

The Company adopted the new standard on January 1, 2019, the effective date of our initial application, using the optional transition method. The Company will not adjust the comparative period financial information prior to January 1, 2019 and will carry forward the legacy (ASC 840) disclosures for comparative periods. In addition, the Company elected the package of practical expedients which allows for companies to not reassess historical lease classifications and initial direct costs for existing leases. Additionally, the Company elected the practical expedients which allow the use of hindsight when determining the lease term, the short-term lease recognition exemption and the option to not separate lease and non-lease components. The adoption of this standard resulted in the recognition of a right-of-use asset and corresponding right-of-use liability on our consolidated balance sheet of less than 3% of total assets, mainly related to our operating leases for office space. The adoption of this standard did not have a material impact on our consolidated statement of income or statement of cash flow.

The adoption of this standard from a lessor perspective did not have a material impact on the Company's consolidated balance sheet, consolidated statement of income or statement of cash flow. Prior to adoption, all of our leases in which we are the lessor were classified as sales-types leases and will continue after adoption of the new standard.

In June 2016, the FASB issued ASU 2016-13, Financial Instruments – Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments. ASU 2016-13 requires the measurement and recognition of expected credit losses for financial instruments held at amortized cost. In November 2018, the FASB issued ASU 2018-19, Codification Improvements to Topic 326 Financial Instruments – Credit Losses, that clarifies receivables arising from operating leases are not within the scope of the credit losses standard, but rather, should be accounted for in accordance with the leases standard. ASU 2016-13 and ASU 2018-19 are effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2019, with early adoption permitted. We are currently evaluating the effect ASU 2016-13 and ASU 2018-19 will have on our consolidated financial statements.

In January 2017, the FASB issued ASU 2017-04, Intangibles – Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment. ASU 2017-04 simplifies the measurement of goodwill by eliminating step 2 of the goodwill impairment test. Under ASU 2017-04, entities will be required to compare the fair value of a reporting unit to its carrying amount and recognize an impairment charge for the amount by which the carrying amount exceeds the reporting unit's fair value. ASU 2017-04 is effective for annual or interim impairment tests performed in fiscal years beginning after December 15, 2019,

with early adoption permitted for annual or interim impairment tests performed on testing dates after January 1, 2017. The amendments should be applied prospectively. We are currently evaluating whether to early adopt ASU 2017-04, but we do not expect it will have a material effect on our consolidated financial statements.

In March 2017, the FASB issued ASU 2017-08, Receivables – Nonrefundable Fees and Other Costs (Subtopic 310-20): Premium Amortization on Purchased Callable Debt Securities, which shortens the amortization period for the premium on certain purchased callable debt securities to the earliest call date. ASU 2017-08 is effective for fiscal years and interim periods within those fiscal years, beginning after December 15, 2018, with early adoption permitted. The amendments should be applied through a modified-retrospective transition approach that requires a cumulative-effect adjustment directly to retained earnings as of the beginning of the period of adoption. The Company adopted ASU 2017-08 on January 1, 2019 and the adoption of this standard did not have a material impact on our consolidated financial statements.

In August 2017, the FASB issued ASU 2017-12, Derivatives and Hedging (Topic 815): Targeted Improvements to Accounting for Hedging Activities. ASU 2017-12 expands and refines hedge accounting for both financial and non-financial risk components, aligns the recognition and presentation of the effects of hedging instruments and hedge items in the financial statements, and includes certain targeted improvements to ease the application of current guidance related to the assessment of hedge effectiveness. ASU 2017-12 is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2018, with early adoption permitted. The Company adopted ASU 2017-12 on January 1, 2019 and the adoption of this standard did not have a material impact on our consolidated financial statements as we currently do not have any hedging instruments.

In February 2018, the FASB issued ASU 2018-02, Income Statement – Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Comprehensive Income. ASU 2018-02 allows for an optional reclassification from accumulated other comprehensive income to retained earnings for stranded tax effects resulting from the Tax Cuts and Jobs Act of 2017. ASU 2018-02 is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2018, with early adoption permitted. The Company adopted ASU 2018-02 on January 1, 2019, and upon adoption elected to reclassify the stranded tax effects related to the Tax Cuts and Jobs Act of 2017 to retained earnings.

In August 2018, the FASB issued ASU 2018-13, Fair Value Measurement (Topic 820) Disclosure Framework-Changes to the Disclosure Requirements for Fair Value Measurement, which changes the fair value measurement disclosure requirements of ASC 820, Fair Value Measurement. The amendments in this ASU are the result of a broader disclosure project called, Concepts Statement No. 8 - Conceptual Framework for Financial Reporting — Chapter 8, Notes to Financial Statements, which the FASB finalized on August 28, 2018. The FASB used the guidance in the Concepts Statement to improve the effectiveness of ASC 820's disclosure requirements. ASU 2018-13 provides users of financial statements with information about assets and liabilities measured at fair value in the statement of financial position or disclosed in the notes to the financial statements. More specifically ASU 2018-13 requires disclosures about the valuation techniques and inputs that are used to arrive at measures of fair value, including judgments and assumptions that are made in determining fair value. In addition, ASU 2018-13 requires disclosures regarding the uncertainty in the fair value measurements as of the reporting date and how changes in fair value measurements affect performance and cash flows. ASU 2018-13 is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2019. We are currently evaluating the effect of ASU 2018-13, but we do not expect it will have a material effect on our financial statement disclosures.

In August 2018, the FASB issued ASU 2018-14, Compensation-Retirement Benefits-Defined Benefit Plans-General (Subtopic 715-20): Disclosure Framework-Changes to the Disclosure Requirements for Defined Benefit Plans, which makes changes to and clarifies the disclosure requirements related to defined benefit pension and other postretirement plans. ASU 2018-14 requires additional disclosures related to the reasons for significant gains and losses affecting the benefit obligation and an explanation of any other significant changes in the benefit obligation or plan assets that are not otherwise apparent in other disclosures required by ASC 715. ASU 2018-14 also clarifies the guidance in ASC 715 to require disclosure of the projected benefit obligation (PBO) and fair value of plan assets for pension plans with PBOs in excess of plan assets and the accumulated benefit obligation (ABO) and fair value of plan assets for pension plans with ABOs in excess of plan assets. ASU 2018-14 is effective for public business entities for fiscal years ending after December 15, 2020. We are currently evaluating the effect of ASU 2018-14, but we do not expect it will have a material effect on our financial statement disclosures.

In August 2018, the FASB issued ASU 2018-15, Intangibles-Goodwill and Other-Internal-Use Software (Subtopic 350-40), Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract. ASU 2018-15 clarifies certain aspects of ASU 2015-05, Customer's Accounting for Fees Paid in a Cloud Computing

Arrangement. Specifically, ASU 2018-15 aligns the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementations costs incurred to develop or obtain internal use software. ASU 2018-15 is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2019, with early adoption permitted. We are currently evaluating whether to early adopt, but we do not expect it will have a material effect on our consolidated financial statements.

During 2018, we adopted the following accounting standards, which had no material effect on our financial position, results of operations or cash flows:

In May 2014, the FASB issued ASU 2014-09, Revenue from Contracts with Customers (Topic 606), which supersedes the revenue recognition requirements in Topic 605, Revenue Recognition, including most industry-specific revenue recognition guidance throughout the Industry Topics of the Codification. The core principle of ASU 2014-09 is to recognize revenues when promised goods or services are transferred to customers in an amount that reflects the consideration that is expected to be received for those goods or services. In August 2015, the FASB issued ASU 2015-14, which deferred the effective date of ASU 2014-09 to fiscal years beginning after December 31, 2017, and interim periods within those fiscal years, with early adoption permitted for reporting periods beginning after December 15, 2016. Subsequently, the FASB issued ASUs in 2016 containing implementation guidance related to ASU 2014-09, including: ASU 2016-08, Revenue from Contracts with Customers (Topic 606): Principal versus Agent Considerations (Reporting Revenue Gross versus Net), which is intended to improve the operability and understandability of the implementation guidance on principal versus agent considerations; ASU 2016-10, Revenue from Contracts with Customers (Topic 606): Identifying Performance Obligations and Licensing, which is intended to clarify two aspects of Topic 606: identifying performance obligations and the licensing implementation guidance; ASU 2016-12, Revenue from Contracts with Customers (Topic 606): Narrow-Scope Improvements and Practical Expedients, which contains certain provisions and practical expedients in response to identified implementation issues; and ASU 2016-20, Technical Corrections and Improvements to Topic 606, Revenue from Contracts with Customers, which is intended to clarify the Codification and/or to correct unintended application of guidance. ASU 2014-09 allows for either full retrospective or modified retrospective adoption. We adopted ASU 2014-09 and the related ASUs on January 1, 2018 using the modified retrospective method, which was applied to all contracts on the date of initial adoption.

These ASUs primarily affected our network implementation service revenue performance obligations and contract costs. We are using the “output method” to measure network implementation services progress, which 1) accelerates revenue recognition for certain performance obligations related to service revenue arrangements that were previously deferred until customer acceptance and 2) requires capitalization and amortization of the incremental costs of obtaining a contract as described below.

In connection with the adoption of the new revenue standard, effective January 1, 2018, we adopted ASC 340-40, Other Assets and Deferred Costs – Contracts with Customers, with respect to capitalization and amortization of incremental costs of obtaining a contract. As a result, certain costs of obtaining a contract, including sales commissions, will be capitalized, as the guidance requires the capitalization of all incremental costs incurred to obtain a contract with a customer that it would not have incurred if the contract had not been obtained, provided the costs are recoverable. The primary effect was the capitalization of certain sales commissions for our extended maintenance and support contracts in excess of one year and amortization of those costs over the period that the related revenue is recognized. Those costs that will be amortized within the next 12 months are included in prepaid expenses and other current assets and those costs that will be amortized after the next 12 months are included in other assets on the consolidated balance sheets.

The cumulative effect of the changes made to our Consolidated Balance Sheet on January 1, 2018 for the adoption of ASU 2014-09 and the related ASUs was as follows:

<i>(In thousands)</i>	Balance at December 31, 2017	Adjustments due to ASU 2014-09	Balance at January 1, 2018
Other receivables	\$26,578	\$374	\$26,952
Deferred tax assets, net	\$23,428	\$(96)	\$23,332
Retained earnings	\$922,178	\$278	\$922,456

The effect of the adoption of ASU 2014-09 and the related ASUs on our financial statements was as follows:

<b>As of December 31, 2018</b>			
<i>(In thousands)</i>	As Reported	Balances Without Adoption of ASC 606	Effect of Adoption of ASC 606
<b>Sales</b>			
Products	\$458,232	\$458,182	\$50
Services	\$71,045	\$67,329	\$3,716
<b>Cost of Sales</b>			
Products	\$278,929	\$278,904	\$25
Services	\$46,783	\$44,788	\$1,995
Loss before benefit for income taxes	\$(33,371)	\$(35,117)	\$1,746
Benefit for income taxes	\$14,029	\$14,763	\$(734)
<b>Net loss</b>	<b>\$(19,342)</b>	<b>\$(20,354)</b>	<b>\$1,012</b>

<b>As of December 31, 2018</b>			
<i>(In thousands)</i>	As Reported	Balances Without Adoption of ASC 606	Effect of Adoption of ASC 606
<b>Assets</b>			
Other receivables	\$36,699	\$32,933	\$3,766
Prepaid expenses and other current assets	\$10,744	\$12,739	\$(1,995)
Inventory	\$99,848	\$99,873	\$(25)
<b>Liabilities</b>			
Income tax payable	\$12,518	\$13,252	\$(734)
<b>Equity</b>			
Retained earnings	\$883,975	\$882,963	\$1,012

In January 2016, the FASB issued ASU 2016-01, Financial Instruments — Overall: Recognition and Measurement of Financial Assets and Financial Liabilities, which addresses certain aspects of the recognition, measurement, presentation and disclosure of financial instruments. Subsequently, the FASB issued ASU 2018-03, Technical Corrections and Improvements to Financial Instruments – Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities, which issued technical corrections and improvements intended to clarify certain aspects of ASU 2016-01. ASU 2016-01 was effective beginning January 1, 2018 and we now recognize any changes in the fair value of certain equity investments in net income as prescribed by the new standard rather than in other comprehensive income. We adopted ASU 2016-01 on January 1, 2018 using the modified retrospective method, which resulted in a \$3.2 million reclassification of net unrealized gains from accumulated other comprehensive income to opening retained earnings. ASU 2018-03 is effective for us with the interim period beginning after June 15, 2018. See Note 5 of Notes to Consolidated Financial Statements for additional information.

In August 2016, the FASB issued ASU 2016-15, Statement of Cash Flows (Topic 230) – Classification of Certain Cash Receipts and Cash Payments, which clarifies how to classify cash receipts and cash payments on the statement of cash flows. The new guidance also clarifies how the predominance principle should be applied when cash receipts and cash payments have aspects of more than one class of cash flows. We adopted ASU 2016-15 on January 1, 2018, which has been applied retrospectively. The adoption of this guidance did not have a material effect on our consolidated financial statements.

In March 2017, the FASB issued ASU 2017-07, Compensation – Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost. ASU 2017-07 amends ASC 715, Compensation — Retirement Benefits, to require employers that present a measure of operating income in their statements of earnings to include only the service cost component of net periodic pension cost and net periodic postretirement benefit cost in operating expenses (together with other employee compensation costs). The other components of net benefit cost, including amortization of prior service cost/credit, and settlement and curtailment effects, are to be included in non-operating expenses. We adopted ASU 2017-07 on January 1, 2018. We retrospectively adopted the presentation of service cost separate from other components of net periodic pension costs. As a result, \$0.4 million and \$0.2 million have been reclassified from cost of sales, selling, general and administrative expenses, and research and development expense to other income (expense), net for the years ended December 31, 2017 and 2016, respectively.

## Note 2 – Business Combinations

On November 30, 2018, we acquired SmartRG, Inc., a provider of carrier-class, open-source connected home platforms and cloud services for broadband service providers for cash consideration. Together, ADTRAN Mosaic and SmartOS provide full end-to-end management and orchestration solutions from cloud edge to subscriber edge. This transaction was accounted for as a business combination. We have included the financial results of this acquisition in our consolidated financial statements since the date of acquisition. These revenues are included in the Subscriber Solutions & Experience category within the Network Solutions and Services & Support reportable segments.

As of the acquisition date, we acquired accounts receivables with a fair value of \$4.9 million all of which we estimate will be collected under the respective terms of each agreement.

Contingent liabilities with a fair value totaling \$1.2 million were recognized at the acquisition date, the payments of which are dependent upon SmartRG achieving future revenue, EBIT or customer purchase order milestones. The contingent payments are subject to arbitration and the final payouts are expected to occur during the first quarter of 2020. The minimum and maximum potential payment under the total of the contingent liabilities ranges from no payment to \$1.5 million. As of December 31, 2018, the fair value of the contingent liability was re-assessed and was determined to be \$1.2 million, based on the expected probable outcomes. No change in fair value was recognized.

An escrow in the amount of \$2.8 million was set up at the acquisition date, to fund post-closing working capital settlements and to indemnify the Company from any inaccuracy or breach of representations, warranties, covenants, agreements or obligations of the sellers. The escrow is subject to arbitration with final settlement expected during the fourth quarter of 2020. The minimum and maximum potential release of funds to the seller ranges from no payment to \$2.8 million.

We have made preliminary allocations of the purchase price to the assets acquired and liabilities assumed based on estimated fair value assessments; however, we are still completing those assessments, including an analysis of the discounted cash flows. Once we finalize the fair values, we may have changes in the following areas: tangible and intangible assets, goodwill, commitments and contingencies, and deferred taxes. We recorded goodwill of \$3.6 million during the year ended December 31, 2018. Goodwill represents the excess of the purchase price over the fair value of net assets acquired. We have assessed the recognition and measurement of the assets acquired and liabilities assumed based on historical and forecasted data for future periods and we have concluded that our valuation procedures and resulting measures were appropriate.

On March 19, 2018, we acquired Sumitomo Electric Lightwave Corp.'s (SEL) North American EPON business and entered into a technology license and OEM supply agreement with Sumitomo Electric Industries, Ltd. (SEI). This acquisition establishes ADTRAN as a North American market leader for EPON solutions for the cable MSO industry and it will accelerate the MSO market's adoption of our open, programmable and scalable architectures. This transaction was accounted for as a business combination. We have included the financial results of this acquisition in our consolidated financial statements since the date of acquisition. These revenues are included in the Access & Aggregation and Subscriber Solutions & Experience categories within the Network Solutions reportable segment.

We recorded a bargain purchase gain of \$11.3 million during the first quarter of 2018, net of income taxes, which is subject to customary working capital adjustments between the parties. The bargain purchase gain of \$11.3 million represents the difference between the fair-value of the net assets acquired over the cash paid. SEI, an OEM supplier based in Japan, is the global market leader in EPON. SEI's Broadband Networks Division, through its SEL subsidiary, operated a North American EPON business that included sales, marketing, support, and region-specific engineering development. The North American EPON market is primarily driven by the Tier 1 cable MSO operators and has developed more slowly than anticipated. Through the transaction, SEI divested its North American EPON assets and established a relationship with ADTRAN. The transfer of these assets to ADTRAN, which included key customer relationships and a required assumption by ADTRAN of relatively low incremental expenses, along with the value of the technology license and OEM supply agreement, resulted in the bargain purchase gain. We have assessed the recognition and measurement of the assets acquired and liabilities assumed based on historical and forecasted data for future periods and we have concluded that our valuation procedures and resulting measures were appropriate. The gain is included in the line item "Gain on bargain purchase of a business" in the 2018 Consolidated Statements of Income.

The preliminary allocation of the purchase price to the estimated fair value of the assets acquired and liabilities assumed at the acquisition date for SmartRG and the final allocation of the purchase price to the estimated fair value of the assets acquired and liabilities assumed at the acquisition date for Sumitomo are as follows:

<i>(In thousands)</i>	Sumitomo	SmartRG
<b>Assets</b>		
Tangible assets acquired	\$1,006	\$8,594
Intangible assets	22,100	9,960
Goodwill	—	3,614
<b>Total assets acquired</b>	<b>23,106</b>	<b>22,168</b>
<b>Liabilities</b>		
Liabilities Assumed	(3,978)	(6,126)
<b>Total liabilities assumed</b>	<b>(3,978)</b>	<b>(6,126)</b>
<b>Total net assets</b>	<b>19,128</b>	<b>16,042</b>
Gain on bargain purchase of a business, net of tax	(11,322)	—
<b>Total purchase price</b>	<b>\$7,806</b>	<b>\$16,042</b>

Our consolidated income statements include the following revenue and net loss attributable to SmartRG and Sumitomo since the date of acquisition:

<i>(In thousands)</i>	March 19, 2018 to December 31, 2018
Revenue	\$9,186
Net Loss	\$(1,297)

The details of the acquired intangible assets are as follows:

<i>(In thousands)</i>	Value	Life (years)
Customer relationships	\$15,190	3 – 12
Developed technology	7,400	7
Licensed technology	5,900	9
Supplier relationship	2,800	2
Licensing agreements	560	5 – 10
Trade name	210	3
<b>Total</b>	<b>\$32,060</b>	

The following unaudited supplemental pro forma information presents the financial results as if the acquisition of SmartRG and Sumitomo had occurred on January 1, 2017. This unaudited supplemental pro forma information does not purport to be indicative of what would have occurred had the acquisition been completed on January 1, 2017, nor is it indicative of any future results. Aside from revising the 2017 net income for the effect of the bargain purchase gains, there were no material, non-recurring adjustments to this unaudited pro forma information.

<i>(In thousands)</i>	2018	2017
Pro forma revenue	\$559,050	\$702,573
Pro forma net income (loss)	\$(33,862)	\$33,206
Pro forma earnings (loss) per share—basic	\$(0.71)	\$0.69
Pro forma earnings (loss) per share—diluted	\$(0.71)	\$0.68

For the year ended December 31, 2018, we incurred acquisition and integration related expenses and amortization of acquired intangibles related to these acquisitions of \$2.9 million.



### **Note 3 - Revenue**

Revenue is measured based on the consideration we expect to receive in exchange for transferring goods or providing services to a customer and as performance obligations under the terms of the contract are satisfied. Generally, this occurs with the transfer of control of a product or service to the customer. For transactions where there are multiple performance obligations, we account for individual products and services separately if they are distinct (if a product or service is separately identifiable from other items and if a customer can benefit from it on its own or with other resources that are readily available to the customer). The consideration, including any discounts, is allocated between separate products and services based on their stand-alone selling prices. The stand-alone selling prices are determined based on the prices at which we sell the separate products and services and are allocated based on each item's relative value to the total value of the products and services in the arrangement. For items that are not sold separately, we estimate stand-alone selling prices primarily using the "expected cost plus a margin" approach. Payment terms are generally 30 days in the U.S. and typically longer in many geographic markets outside the U.S. Shipping fees are recorded as revenue and the related cost is included in cost of sales. Sales, value-added, and other taxes collected concurrently with revenue-producing activities are excluded from revenue. Costs of obtaining a contract are capitalized and amortized over the period that the related revenue is recognized if greater than one year. We have elected to apply the practical expedient related to the incremental costs of obtaining contracts and recognize those costs as an expense when incurred if the amortization period of the assets is one year or less. These costs are included in selling, general and administrative expenses. Capitalized costs with an amortization period greater than one year were immaterial.

The following is a description of the principal activities from which we generate our revenue by reportable segment.

#### **Network Solutions Segment**

Network Solutions includes hardware products and software defined next-generation virtualized solutions used in service provider or business networks, as well as prior generation products. The majority of the revenue from this segment is from hardware sales.

##### **Hardware and Software Revenue**

Revenue from hardware sales is recognized when control is transferred to our customers, which is generally when we ship the products. Shipping terms are generally FOB shipping point. This segment also includes revenues from software license sales which is recognized at delivery and transfer of control to the customer. Revenue is recorded net of estimated discounts and rebates using historical trends. Customers are typically invoiced when control is transferred and revenue is recognized. Our products generally include assurance-based warranties of 90 days to five years for product defects, which are accrued at the time revenue is recognized.

In certain transactions, we are also the lessor in sales-type lease arrangements for network equipment that have terms of 18 months to five years. These arrangements typically include network equipment, network implementation services and maintenance services. Product revenue for these leases is generally recorded when we transfer control of the product to our customers. Revenue for network implementation and maintenance services is recognized as described below. Customers are typically invoiced and pay in equal installments over the lease term. In relation to these lease agreements, during the years ended December 31, 2018, 2017 and 2016 we recognized revenue of \$13.7 million, \$16.5 million and \$2.7 million, respectively.

#### **Services & Support Segment**

To complement our Network Solutions segment, we offer a complete portfolio of maintenance, network implementation, and solutions integration and managed services, which include hosted cloud services and subscription services.

##### **Maintenance Revenue**

Our maintenance service periods range from one month to five years. Customers are typically invoiced and pay for maintenance services at the beginning of the maintenance period. We recognize revenue for maintenance services on a straight-line basis over the maintenance period in services revenue as our customers benefit evenly throughout the contract term and deferred revenues are recorded in current and non-current unearned revenue.

##### **Network Implementation Revenue**

We recognize revenue for network implementation, which primarily consists of engineering, execution, and enablement services, at a point in time when each performance obligation is complete. If we have recognized revenue, but have not billed the customer, the right to consideration is recognized as a contract asset that is included in other receivables in the Consolidated Balance Sheet. The contract asset is transferred to accounts receivable when the completed performance obligation is invoiced to the customer.

As of December 31, 2018, we did not have any significant performance obligations related to customer contracts that had an original expected duration of one year or more, other than maintenance services, which are satisfied over time.

The following table provides information about receivables, contract assets and unearned revenue from contracts with customers:

<i>(In thousands)</i>	December 31, 2018	January 1, 2018
Accounts receivable	\$99,385	\$144,150
Contract assets	\$3,766	\$374
Unearned revenue	\$17,940	\$13,070
Non-current unearned revenue	\$5,296	\$4,556

The decrease in accounts receivable is due to the collection of customer-specific payment terms that became due in the first quarter of 2018. The increase in the contract asset balance for the year ended December 31, 2018 is primarily attributable to revenue recognized that has not yet been billed to the customer during the period. The increase in the unearned revenue balance as of the year ended December 31, 2018, is primarily attributable to cash payments received or due in advance of satisfying our performance obligations, offset by \$9.9 million of revenues recognized that were included in the unearned revenue balance as of December 31, 2017.

The following table disaggregates our revenue by major source for the year ended December 31, 2018.

<i>(In thousands)</i>	Network Solutions	Services & Support	Total
Access & Aggregation	\$301,801	\$57,069	\$358,870
Subscriber Solutions & Experience <sup>(1)</sup>	129,067	5,393	134,460
Traditional & Other Products	27,364	8,583	35,947
<b>Total</b>	<b>\$458,232</b>	<b>\$71,045</b>	<b>\$529,277</b>

<sup>(1)</sup> *Subscriber Solutions & Experience was formerly reported as Customer Devices. With the increasing focus on enhancing the customer experience for both our business and consumer broadband customers and the addition of SmartRG during the fourth quarter of 2018, Subscriber Solutions & Experience more accurately represents this revenue category.*

## Note 4 – Stock-Based Compensation

### Stock Incentive Program Descriptions

On January 23, 2006, the Board of Directors adopted the ADTRAN, Inc. 2006 Employee Stock Incentive Plan (2006 Plan), which authorized 13.0 million shares of common stock for issuance to certain employees and officers through incentive stock options and non-qualified stock options, stock appreciation rights, RSUs, and restricted stock. The 2006 Plan was adopted by stockholder approval at our annual meeting of stockholders held on May 9, 2006. Options granted under the 2006 Plan typically become exercisable beginning after one year of continued employment, normally pursuant to a four-year vesting schedule beginning on the first anniversary of the grant date, and have a ten-year contractual term. The 2006 Plan was replaced on May 13, 2015, by the ADTRAN, Inc. 2015 Employee Stock Incentive Plan (2015 Plan). Expiration dates of options outstanding as of December 31, 2018, under the 2006 Plan range from 2019 to 2024.

On January 20, 2015, the Board of Directors adopted the ADTRAN, Inc. 2015 Employee Stock Incentive Plan (2015 Plan), which authorized 7.7 million shares of common stock for issuance to certain employees and officers through incentive stock options and non-qualified stock options, stock appreciation rights, PSUs, RSUs, and restricted stock. The 2015 Plan was adopted by stockholder approval at our annual meeting of stockholders held on May 13, 2015. PSUs, RSUs, and restricted stock granted under the 2015 Plan reduce the shares authorized for issuance under the 2015 Plan by 2.5 shares of common stock for each share underlying the award. Options granted under the 2015 Plan typically become exercisable beginning after one year of continued employment, normally pursuant to a four-year vesting schedule beginning on the first anniversary of the grant date, and have a ten-year contractual term. Expiration dates of options outstanding as of December 31, 2018 under the 2015 Plan range from 2025 to 2026.

Our stockholders approved the 2010 Directors Stock Plan (2010 Directors Plan) on May 5, 2010, under which 0.5 million shares of common stock have been reserved. This plan replaces the 2005 Directors Stock Option Plan. Under the 2010 Directors Plan, the Company may issue stock options, restricted stock and RSUs to our non-employee directors. Stock awards

issued under the 2010 Directors Plan normally become vested in full on the first anniversary of the grant date. Options issued under the 2010 Directors Plan have a 10-year contractual term. All remaining options outstanding as of December 31, 2018, under the 2010 Directors Plan will expire in 2019.

The following table summarizes stock-based compensation expense related to stock options, PSUs, RSUs and restricted stock for the years ended December 31, 2018, 2017 and 2016, which was recognized as follows:

<i>(In thousands)</i>	2018	2017	2016
<b>Stock-based compensation expense included in cost of sales</b>	<b>\$418</b>	<b>\$379</b>	<b>\$389</b>
Selling, general and administrative expense	3,989	4,063	3,341
Research and development expense	2,748	2,991	2,965
<b>Stock-based compensation expense included in operating expenses</b>	<b>6,737</b>	<b>7,054</b>	<b>6,306</b>
<b>Total stock-based compensation expense</b>	<b>7,155</b>	<b>7,433</b>	<b>6,695</b>
Tax benefit for expense associated with non-qualified options, PSUs, RSUs and restricted stock	(1,432)	(1,699)	(963)
<b>Total stock-based compensation expense, net of tax</b>	<b>\$5,723</b>	<b>\$5,734</b>	<b>\$5,732</b>

With our adoption of ASU 2016-09 Compensation – Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting in January 2017, we elected to discontinue our past practice of estimating forfeitures and now account for forfeitures as they occur.

### Stock Options

The following table is a summary of our stock options outstanding as of December 31, 2017 and 2018, and the changes that occurred during 2018:

<i>(In thousands, except per share amounts)</i>	Number of Options	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life in Years	Aggregate Intrinsic Value
<b>Stock options outstanding, December 31, 2017</b>	<b>5,148</b>	<b>\$22.65</b>	<b>4.87</b>	<b>\$6,109</b>
Stock options granted	—	\$—		
Stock options exercised	(96)	\$15.46		
Stock options forfeited	(73)	\$16.49		
Stock options expired	(597)	\$22.58		
<b>Stock options outstanding, December 31, 2018</b>	<b>4,382</b>	<b>\$22.91</b>	<b>4.10</b>	<b>\$—</b>
<b>Stock options exercisable, December 31, 2018</b>	<b>4,131</b>	<b>\$23.37</b>	<b>3.93</b>	<b>\$—</b>

At December 31, 2018, total unrecognized compensation expense related to non-vested stock options was approximately \$0.8 million, which is expected to be recognized over an average remaining recognition period of one year.

All of the options above were issued at exercise prices that approximated fair market value at the date of grant. At December 31, 2018, 2.5 million options were available for grant under the shareholder-approved plans.

The aggregate intrinsic values in the table above represent the total pre-tax intrinsic value (the difference between ADTRAN's closing stock price on the last trading day of 2018 and the exercise price, multiplied by the number of in-the-money options) that would have been received by the option holders had all option holders exercised their options on December 31, 2018. The amount of aggregate intrinsic value will change based on the fair market value of ADTRAN's stock.

The total pre-tax intrinsic value of options exercised during 2018, 2017 and 2016 was \$0.2 million, \$3.4 million and \$1.1 million, respectively. The fair value of options fully vesting during 2018, 2017 and 2016 was \$2.5 million, \$4.3 million and \$5.7 million, respectively.

The following table further describes our stock options outstanding as of December 31, 2018:

Range of Exercise Prices	Options Outstanding			Options Exercisable	
	Options Outstanding at 12/31/18 (in thousands)	Weighted Avg. Remaining Contractual Life in Years	Weighted Average Exercise Price	Options Exercisable at 12/31/18 (in thousands)	Weighted Average Exercise Price
\$14.88 – 18.96	1,257	5.93	\$15.87	1,006	\$15.99
\$18.97 – 23.45	739	5.68	\$19.12	739	\$19.12
\$23.46 – 30.35	1,223	3.18	\$23.87	1,223	\$23.87
\$30.36 – 41.92	1,163	2.29	\$31.93	1,163	\$31.93
	<b>4,382</b>			<b>4,131</b>	

We use the Black-Scholes option pricing model (Black-Scholes Model) for the purpose of determining the estimated fair value of stock option awards on the date of grant. The Black-Scholes Model requires the input of certain assumptions that involve judgment. Because our stock options have characteristics significantly different from those of traded options, and because changes in the input assumptions can materially affect the fair value estimate, existing models may not provide reliable measures of fair value of our stock options.

The stock option pricing model requires the use of several assumptions that impact the fair value estimate. These variables include, but are not limited to, the volatility of our stock price and employee exercise behaviors.

There were no stock options granted in 2017 or 2018. The weighted-average estimated fair value of stock options granted to employees during the year ended December 31, 2016, was \$5.22 per share, with the following weighted-average assumptions:

	2016
Expected volatility	34.79%
Risk-free interest rate	1.36%
Expected dividend yield	1.98%
Expected life (in years)	6.25

We based our estimate of expected volatility for the year ended December 31, 2016 on the sequential historical daily trading data of our common stock for a period equal to the expected life of the options granted. The selection of the historical volatility method was based on available data indicating our historical volatility is as equally representative of our future stock price trends as is our implied volatility. The risk-free interest rate assumption is based upon implied yields of U.S. Treasury zero-coupon bonds on the date of grant having a remaining term equal to the expected life of the options granted. The dividend yield is based on our historical and expected dividend payouts. The expected life of our stock options is based upon historical exercise and forfeiture activity of our previous stock-based grants with a ten-year contractual term.

#### PSUs, RSUs and restricted stock

Under the 2015 Plan, awards other than stock options, including PSUs, RSUs, and restricted stock, may be granted to certain employees and officers.

Under our market-based PSU program, the number of shares of common stock earned by a recipient pursuant to the PSUs is subject to a market condition based on ADTRAN's relative total shareholder return against all companies in the NASDAQ Telecommunications Index at the end of a three-year performance period. Depending on the relative total shareholder return over the performance period, the recipient may earn from 0% to 150% of the shares underlying the PSUs, with the shares earned distributed upon the vesting of the PSUs at the end of the three-year performance period. The fair value of the award is based on the market price of our common stock on the date of grant, adjusted for the expected outcome of the impact of market conditions using a Monte Carlo Simulation valuation method. A portion of the granted PSUs vests and the underlying shares become deliverable upon the death or disability of the recipient or upon a change of control of ADTRAN, as defined by the 2015 Plan. The recipients of the PSUs receive dividend credits based on the shares of common stock underlying the PSUs. The dividend credits are vested and earned in the same manner as the PSUs and are paid in cash upon the issuance of common stock for the PSUs.

During the first quarter of 2017, the Compensation Committee of the Board of Directors approved a one-time PSU grant of 0.5 million shares that contain performance conditions and vest at the end of a three-year period if such performance conditions are met. The fair value of these performance-based PSU awards was equal to the closing price of our stock on the date of grant.

The fair value of RSUs and restricted stock is equal to the closing price of our stock on the business day immediately preceding the grant date. RSUs and restricted stock vest ratably over four-year and one-year periods, respectively.

We will continue to assess the assumptions and methodologies used to calculate the estimated fair value of stock-based compensation. If circumstances change, and additional data becomes available over time, we may change our assumptions and methodologies, which may materially impact our fair value determination.

The following table is a summary of our PSUs, RSUs and restricted stock outstanding as of December 31, 2017 and 2018, and the changes that occurred during 2018. The unvested awards outstanding as of December 31, 2017, have been adjusted for the actual shares vested in 2018 for our market-based PSUs.

<i>(In thousands except per share amounts)</i>	Number of Shares	Weighted Average Grant Date Fair Value
<b>Unvested PSUs, RSUs and restricted stock outstanding, December 31, 2017</b>	<b>1,292</b>	<b>\$21.33</b>
PSUs, RSUs and restricted stock granted	690	\$14.48
PSUs, RSUs and restricted stock vested	(217)	\$19.94
PSUs, RSUs and restricted stock forfeited	(195)	\$21.29
<b>Unvested RSUs and restricted stock outstanding, December 31, 2018</b>	<b>1,570</b>	<b>\$18.52</b>

At December 31, 2018, total unrecognized compensation expense related to the non-vested portion of market-based PSUs, RSUs and restricted stock was approximately \$17.8 million, which is expected to be recognized over an average remaining recognition period of 3.0 years. In addition, there was \$9.1 million of unrecognized compensation expense related to the unvested 2017 performance-based PSUs, which will be recognized over the remaining requisite service period if achievement of the performance obligation becomes probable. For the years ended December 31, 2018 and 2017, no compensation expense was recognized related to these performance-based PSUs.

The market based PSU pricing model also requires the use of several significant assumptions that impact the fair value estimate. The estimated fair value of the PSUs granted to employees during the year ended December 31, 2018, 2017 and 2016 was \$16.59 per share, \$24.17 per share and \$23.50 per share, respectively, with the following assumptions:

	2018	2017	2016
Expected volatility	27.98% to 31.58%	27.03%	29.79%
Risk-free interest rate	2.11% to 2.99%	1.78%	1.17%
Expected dividend yield	1.83% to 2.49%	1.74%	1.80%

## Note 5 – Investments

### Debt securities and Other Investments

At December 31, 2018, we held the following debt securities and other investments, recorded at either fair value or cost:

<i>(In thousands)</i>	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Carrying Value
Corporate bonds	\$20,777	\$19	\$(112)	\$20,684
Municipal fixed-rate bonds	1,339	—	(26)	1,313
Asset-backed bonds	5,230	5	(14)	5,221
Mortgage/Agency-backed bonds	3,833	2	(44)	3,791
U.S. government bonds	9,271	1	(66)	9,206
Foreign government bonds	592	—	(8)	584
<b>Available-for-sale securities held at fair value</b>	<b>\$41,042</b>	<b>\$27</b>	<b>\$(270)</b>	<b>\$40,799</b>
<b>Restricted investment held at cost</b>				<b>25,600</b>
<b>Other investments held at cost</b>				<b>397</b>
<b>Total carrying value of available-for-sale investments</b>				<b>\$66,796</b>

At December 31, 2017, we held the following debt securities and other investments, recorded at either fair value or cost:

<i>(In thousands)</i>	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Carrying Value
Corporate bonds	\$32,654	\$44	\$(155)	\$32,543
Municipal fixed-rate bonds	2,902	2	(22)	2,882
Asset-backed bonds	6,545	1	(20)	6,526
Mortgage/Agency-backed bonds	5,554	1	(46)	5,509
U.S. government bonds	14,477	—	(174)	14,303
Foreign government bonds	725	5	—	730
<b>Available-for-sale securities held at fair value</b>	<b>\$62,857</b>	<b>\$53</b>	<b>\$(417)</b>	<b>\$62,493</b>
<b>Restricted investment held at cost</b>				<b>27,800</b>
<b>Other investments held at cost</b>				<b>547</b>
<b>Total carrying value of available-for-sale investments</b>				<b>\$90,840</b>

As of December 31, 2018, our debt securities had the following contractual maturities:

<i>(In thousands)</i>	Corporate Bonds	Municipal Fixed-rate Bonds	Asset-backed Bonds	Mortgage/Agency-backed Bonds	U.S. Government Bonds	Foreign Government Bonds
Less than one year	\$2,127	\$176	\$943	\$—	\$—	\$—
One to two years	11,557	208	401	—	6,714	285
Two to three years	6,831	929	193	425	—	299
Three to five years	169	—	2,433	853	2,492	—
Five to ten years	—	—	260	6	—	—
More than ten years	—	—	991	2,507	—	—
<b>Total</b>	<b>\$20,684</b>	<b>\$1,313</b>	<b>\$5,221</b>	<b>\$3,791</b>	<b>\$9,206</b>	<b>\$584</b>

Actual maturities may differ from contractual maturities as some borrowers have the right to call or prepay obligations with or without call or prepayment penalties.

Realized gains and losses on sales of securities are computed under the specific identification method. The following table presents gross realized gains and losses related to our debt securities for the years ended December 31, 2018, 2017 and 2016:

<i>(In thousands)</i>	2018	2017	2016
<b>Year Ended December 31,</b>			
Gross realized gains on debt securities	\$57	\$169	\$341
Gross realized losses on debt securities	(592)	(226)	(222)
<b>Total gain (loss) recognized, net</b>	<b>\$(535)</b>	<b>\$(57)</b>	<b>\$119</b>

Our investment policy provides limitations for issuer concentration, which limits, at the time of purchase, the concentration in any one issuer to 5% of the market value of our total investment portfolio.

The following table presents the breakdown of debt securities and other investments with unrealized losses at December 31, 2018:

<i>(In thousands)</i>	<b>Continuous Unrealized Loss Position for Less than 12 Months</b>		<b>Continuous Unrealized Loss Position for 12 Months or Greater</b>		<b>Total</b>	
	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses
Corporate bonds	\$11,129	\$(60)	\$3,608	\$(52)	\$14,737	\$(112)
Municipal fixed-rate bonds	—	—	1,136	(26)	1,136	(26)
Asset-backed bonds	1,874	(2)	1,257	(12)	3,131	(14)
Mortgage/Agency-backed bonds	1,021	(5)	1,918	(39)	2,939	(44)
U.S. government bonds	6,527	(48)	537	(18)	7,064	(66)
Foreign government bonds	584	(8)	—	—	584	(8)
<b>Total</b>	<b>\$21,135</b>	<b>\$(123)</b>	<b>\$8,456</b>	<b>\$(147)</b>	<b>\$29,591</b>	<b>\$(270)</b>

The following table presents the breakdown of debt securities and other investments with unrealized losses at December 31, 2017:

<i>(In thousands)</i>	<b>Continuous Unrealized Loss Position for Less than 12 Months</b>		<b>Continuous Unrealized Loss Position for 12 Months or Greater</b>		<b>Total</b>	
	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses	Fair Value	Unrealized Losses
Corporate bonds	\$16,015	\$(58)	\$6,112	\$(97)	\$22,127	\$(155)
Municipal fixed-rate bonds	230	—	1,165	(22)	1,395	(22)
Asset-backed bonds	4,941	(17)	179	(3)	5,120	(20)
Mortgage/Agency-backed bonds	3,062	(8)	1,673	(38)	4,735	(46)
U.S. government bonds	2,754	(26)	11,549	(148)	14,303	(174)
<b>Total</b>	<b>\$27,002</b>	<b>\$(109)</b>	<b>\$20,678</b>	<b>\$(308)</b>	<b>\$47,680</b>	<b>\$(417)</b>

The decrease in unrealized losses during 2018, as reflected in the table above, results from changes in market positions associated with our fixed income portfolio.

### Marketable Equity Securities

Our marketable equity securities consist of publicly traded stocks or funds measured at fair value.

Prior to January 1, 2018, our marketable equity securities were classified as available-for-sale. Realized gains and losses on marketable equity securities were included in net investment gain (loss). Unrealized gains and losses were recognized in accumulated other comprehensive income, net of deferred taxes, on the balance sheet.

On January 1, 2018, we adopted ASU 2016-01, which requires us to measure all equity investments that do not result in consolidation and are not accounted for under the equity method at fair value, with any changes in fair value recognized in net investment gain (loss). Upon adoption, we reclassified \$3.2 million of net unrealized gains related to marketable equity securities from accumulated other comprehensive income (loss) to opening retained earnings.

Realized and unrealized gains and losses for our marketable equity securities for the twelve months ended December 31, 2018 were as follows:

<i>(in thousands)</i>	<b>2018</b>
Realized gains on equity securities sold	\$1,306
Unrealized losses on equity securities held	(4,821)
<b>Total loss recognized, net</b>	<b>\$(3,515)</b>

We have categorized our cash equivalents and our investments held at fair value into a three-level fair value hierarchy based on the priority of the inputs to the valuation technique for the cash equivalents and investments as follows: Level 1 - Values based on unadjusted quoted prices for identical assets or liabilities in an active market; Level 2 - Values based on quoted prices in markets that are not active or model inputs that are observable either directly or indirectly; Level 3 - Values based on prices or valuation techniques that require inputs that are both unobservable and significant to the overall fair value measurement. These inputs could include information supplied by investees.

### Fair Value Measurements at December 31, 2018 Using

<i>(In thousands)</i>	Fair Value	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
<b>Cash equivalents</b>				
Money market funds	\$1,554	\$1,554	\$ —	\$ —
<b>Cash equivalents</b>	<b>1,554</b>	<b>1,554</b>	<b>—</b>	<b>—</b>
<b>Available-for-sale debt securities</b>				
Corporate bonds	20,684	—	20,684	—
Municipal fixed-rate bonds	1,313	—	1,313	—
Asset-backed bonds	5,221	—	5,221	—
Mortgage/Agency-backed bonds	3,791	—	3,791	—
U.S. government bonds	9,206	9,206	—	—
Foreign government bonds	584	—	584	—
<b>Marketable equity securities</b>				
Marketable equity securities – various industries	26,763	26,763	—	—
Equity in escrow	253	253	—	—
Deferred compensation plan assets	18,256	18,256	—	—
<b>Available-for-sale securities</b>	<b>86,071</b>	<b>54,478</b>	<b>31,593</b>	<b>—</b>
<b>Total</b>	<b>\$87,625</b>	<b>\$56,032</b>	<b>\$31,593</b>	<b>\$ —</b>

### Fair Value Measurements at December 31, 2017 Using

<i>(In thousands)</i>	Fair Value	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
<b>Cash equivalents</b>				
Money market funds	\$5,851	\$5,851	\$ —	\$ —
Commercial paper	3,999	—	3,999	—
<b>Cash equivalents</b>	<b>9,850</b>	<b>5,851</b>	<b>3,999</b>	<b>—</b>
<b>Available-for-sale debt securities</b>				
Corporate bonds	32,543	—	32,543	—
Municipal fixed-rate bonds	2,882	—	2,882	—
Asset-backed bonds	6,526	—	6,526	—
Mortgage/Agency-backed bonds	5,509	—	5,509	—
U.S. government bonds	14,303	14,303	—	—
Foreign government bonds	730	—	730	—
<b>Marketable equity securities</b>				
Marketable equity securities – various industries	35,662	35,662	—	—
Deferred compensation plan assets	19,883	19,883	—	—
<b>Available-for-sale securities</b>	<b>118,038</b>	<b>69,848</b>	<b>48,190</b>	<b>—</b>
<b>Total</b>	<b>\$127,888</b>	<b>\$75,699</b>	<b>\$52,189</b>	<b>\$ —</b>

The fair value of our Level 2 securities is calculated using a weighted average market price for each security. Market prices are obtained from a variety of industry standard data providers, security master files from large financial institutions, and other third-party sources. These multiple market prices are used as inputs into a distribution-curve-based algorithm to determine the daily market value of each security.



## Note 6 – Derivative Instruments and Hedging Activities

We participate in foreign exchange forward contracts in connection with the management of exposure to fluctuations in foreign exchange rates.

### Cash Flow Hedges

Our cash flow hedging activities utilize foreign exchange forward contracts to reduce the risk that movements in exchange rates will adversely affect the net cash flows resulting from the planned purchase of products from foreign suppliers. Purchases of U.S. denominated inventory by our European subsidiary represent our primary exposure. Changes in the fair value of derivatives designated as cash flow hedges are not recognized in current operating results, but are recorded in accumulated other comprehensive income. Amounts related to cash flow hedges are reclassified from accumulated other comprehensive income when the underlying hedged item impacts earnings. This reclassification is recorded in the same line item of the consolidated statements of income as where the effects of the hedged item are recorded, which is cost of sales.

### Undesignated Hedges

We have certain customers and suppliers who are invoiced or pay in a non-functional currency. Changes in the monetary exchange rates may adversely affect our results of operations and financial condition, as outstanding non-functional balances are revalued to the functional currency through profit and loss. When appropriate, we utilize foreign exchange forward contracts to help manage the volatility relating to these valuation exposures. All changes in the fair value of our derivative instruments that do not qualify for or are not designated for hedged accounting transactions are recognized as other income (expense), net in the Consolidated Statements of Income.

We do not hold or issue derivative instruments for trading or other speculative purposes. Our derivative instruments are recorded in the Consolidated Balance Sheets at their fair values. Our derivative instruments are not subject to master netting arrangements and are not offset in the Consolidated Balance Sheets.

As of December 31, 2018 and 2017, we had no foreign exchange forward contracts.

The change in the fair values of our derivative instruments recorded in the Consolidated Statements of Income during the years ended December 31, 2018, 2017 and 2016 were as follows:

<i>(In thousands)</i>	Income Statement Location	2018	2017	2016
Derivatives Not Designated as Hedging Instruments:				
Foreign exchange contracts	Other income (expense)	\$13	\$(754)	\$724

The change in our derivatives designated as hedging instruments recorded in other comprehensive income (OCI) and reclassified to income, net of tax, during the twelve months ended December 31, 2018, 2017 and 2016 were as follows:

<i>(In thousands)</i>	Location of Losses Reclassified from AOCI into Income	Amount of Gains (Losses) Reclassified from AOCI into Income		
		2018	2017	2016
Derivatives Designated as Hedging Instruments:				
Foreign exchange contracts	Cost of Sales	\$—	\$(897)	\$—

## Note 7 – Inventory

At December 31, 2018 and 2017, inventory was comprised of the following:

<i>(In thousands)</i>	2018	2017
Raw materials	\$45,333	\$44,185
Work in process	1,638	1,939
Finished goods	52,877	76,418
<b>Total Inventory, net</b>	<b>\$99,848</b>	<b>\$122,542</b>

We establish reserves for estimated excess, obsolete, or unmarketable inventory equal to the difference between the cost of the inventory and the estimated fair value of the inventory based upon assumptions about future demand, market conditions, and life. At December 31, 2018 and 2017, raw materials reserves totaled \$17.6 million and \$15.0 million, respectively, and finished goods inventory reserves totaled \$12.4 million and \$8.3 million, respectively.

### Note 8 – Property, Plant and Equipment

At December 31, 2018 and 2017, property, plant and equipment were comprised of the following:

<i>(In thousands)</i>	2018	2017
Land	\$4,575	\$4,575
Building and land improvements	34,379	32,470
Building	68,183	68,301
Furniture and fixtures	19,831	19,489
Computer hardware and software	92,071	90,726
Engineering and other equipment	127,060	123,363
<b>Total Property, Plant and Equipment</b>	<b>346,099</b>	<b>338,924</b>
Less accumulated depreciation	(265,464)	(253,845)
<b>Total Property, Plant and Equipment, net</b>	<b>\$80,635</b>	<b>\$85,079</b>

Depreciation expense was \$12.7 million, \$12.8 million and \$12.0 million for the years ended December 31, 2018, 2017 and 2016, respectively, which is recorded in cost of sales, selling, general and administrative expense and research and development expense in the consolidated statements of income.

### Note 9 – Lease Arrangements

We are the lessor in sales-type lease arrangements for network equipment, which have terms of 18 months to five years. The net investment in sales-type leases consists of lease receivables less unearned income. Collectability of sales-type leases is evaluated periodically at an individual customer level. At December 31, 2018 and 2017, we had no allowance for credit losses for our net investment in sales-type leases. As of December 31, 2018 and 2017, the components of the net investment in sales-type leases were as follows:

<i>(In thousands)</i>	2018	2017
Current minimum lease payments receivable (included in other receivables)	\$11,339	\$11,325
Non-current minimum lease payments receivable (included in other assets)	1,670	2,913
<b>Total minimum lease payments receivable</b>	<b>13,009</b>	<b>14,238</b>
Less: Current unearned revenue	631	707
Less: Non-current unearned revenue	473	787
<b>Net investment in sales-type leases</b>	<b>\$11,905</b>	<b>\$12,744</b>

Future minimum lease payments to be received from sales-type leases as of December 31, 2018, are as follows:

<i>(In thousands)</i>	Amount <sup>(1)</sup>
2019	\$11,339
2020	990
2021	431
2022	189
2023	60
<b>Total</b>	<b>\$13,009</b>

<sup>(1)</sup> \$9.4 million of these future minimum lease payments relate to one of our customers who filed for Chapter 11 bankruptcy in February 2019. Therefore, there is a potential risk of uncollectibility related to any outstanding balance. See Note 18 of Notes to Consolidated Financial Statements for additional information.

## Note 10 – Goodwill and Intangible Assets

Goodwill, which relates to our acquisitions of Bluesocket, Inc. and SmartRG, were \$7.1 million at December 31, 2018, and \$3.5 million at December 31, 2017, of which \$6.7 million and \$0.4 million is allocated to our Network Solutions and Services & Support reportable segments, respectively, for the year ended December 31, 2018, and of which \$3.1 million and \$0.4 million is allocated to our Network Solutions and Services & Support reportable segments, respectively, for the year ended December 31, 2017.

We evaluate the carrying value of goodwill during the fourth quarter of each year and between annual evaluations if events occur or circumstances change that would more likely than not reduce the fair value of the reporting unit below its carrying amount. We have elected to first assess the qualitative factors to determine whether it is more likely than not that the fair value of the reporting unit to which the goodwill is assigned is less than its carrying amount as a basis for determining whether it is necessary to perform the two-step impairment test. If we determine that it is more likely than not that its fair value is less than its carrying amount, then the two-step impairment test is performed. Based on the results of our qualitative assessment in 2018, we concluded that it was not necessary to perform the two-step impairment test. There were no impairment losses on goodwill recognized for the years ended December 31, 2018, 2017 and 2016.

The following table presents our intangible assets as of December 31, 2018 and 2017:

<i>(In thousands)</i>	2018			2017		
	Gross Value	Accumulated Amortization	Net Value	Gross Value	Accumulated Amortization	Net Value
Customer relationships	\$22,455	\$(5,380)	\$17,075	\$7,474	\$(4,283)	\$3,191
Developed technology	12,801	(4,867)	7,934	5,524	(4,663)	861
Licensed technology	5,900	(520)	5,380	—	—	—
Supplier relationships	2,800	(1,108)	1,692	—	—	—
Patents	500	(157)	343	500	(89)	411
Licensing agreements	560	(5)	555	—	—	—
Intellectual property	930	(930)	—	930	(852)	78
Non-compete	200	(200)	—	200	(115)	85
Trade names	310	(106)	204	100	(65)	35
<b>Total</b>	<b>\$46,456</b>	<b>\$(13,273)</b>	<b>\$33,183</b>	<b>\$14,728</b>	<b>\$(10,067)</b>	<b>\$4,661</b>

Amortization expense was \$2.3 million, \$2.9 million and \$2.5 million for the years ended December 31, 2018, 2017 and 2016, respectively.

As of December 31, 2018, the estimated future amortization expense of intangible assets is as follows:

<i>(In thousands)</i>	Amount
2019	\$5,332
2020	4,450
2021	4,101
2022	3,477
2023	3,325
Thereafter	12,498
<b>Total</b>	<b>\$33,183</b>

## Note 11 – Alabama State Industrial Development Authority Financing and Economic Incentives

In conjunction with the 1995 expansion of our Huntsville, Alabama, facility, we were approved for participation in an incentive program offered by the State of Alabama Industrial Development Authority (the Authority). Pursuant to the program, on January 13, 1995, the Authority issued \$20.0 million of its taxable revenue bonds and loaned the proceeds from the sale of the bonds to ADTRAN. The bonds were originally purchased by AmSouth Bank of Alabama, Birmingham, Alabama (now Regions Bank of Alabama) (the Bank). Wachovia Bank, N.A., Nashville, Tennessee (formerly First Union National Bank of Tennessee) (the Bondholder), which was acquired by Wells Fargo & Company on December 31, 2008, purchased the original bonds from the Bank and made further advances to the Authority, bringing the total amount outstanding to \$50.0 million.

An Amended and Restated Taxable Revenue Bond (Amended and Restated Bond) was issued and the original financing agreement was amended. The Amended and Restated Bond bears interest, payable monthly. The interest rate is 2% per annum. The Amended and Restated Bond matures on January 1, 2020, and is currently outstanding in the aggregate principal amount of \$25.6 million. The estimated fair value of the bond using a level 2 valuation technique at December 31, 2018, was approximately \$25.4 million based on a debt security with a comparable interest rate and maturity and a Standard & Poor's credit rating of AAA. We are required to make payments to the Authority in amounts necessary to pay the interest on the Amended and Restated Bond. Included in long-term investments at December 31, 2018, is \$25.6 million which is invested in a restricted certificate of deposit. These funds serve as a collateral deposit against the principal of this bond, and we have the right to set-off the balance of the Amended and Restated Bond with the collateral deposit in order to reduce the balance of the indebtedness.

In conjunction with this program, we are eligible to receive certain economic incentives from the state of Alabama that reduce the amount of payroll withholdings that we are required to remit to the state for those employment positions that qualify under the program. We realized economic incentives related to payroll withholdings totaling \$1.4 million, \$1.5 million and \$1.3 million for the years ended December 31, 2018, 2017 and 2016, respectively.

We made principal payments of \$1.1 million for each of the years ended December 31, 2018 and 2017, and anticipate making a principal payment in 2019. At December 31, 2018 and 2017, \$1.0 million and \$1.1 million, respectively of the bond debt was classified as a current liability in accounts payable in the Consolidated Balance Sheets.

## Note 12 – Income Taxes

A summary of the components of the provision (benefit) for income taxes for the years ended December 31, 2018, 2017 and 2016 is as follows:

<i>(In thousands)</i>	2018	2017	2016
<b>Current</b>			
Federal	\$(8,001)	\$466	\$12,733
State	(476)	(150)	1,141
International	11,705	6,458	477
<b>Total Current</b>	<b>3,228</b>	<b>6,774</b>	<b>14,351</b>
<b>Deferred</b>			
Federal	(14,448)	8,024	647
State	(3,390)	1,882	73
International	581	4,167	(3,405)
<b>Total Deferred</b>	<b>(17,257)</b>	<b>14,073</b>	<b>(2,685)</b>
<b>Total Provision (Benefit) for Income Taxes</b>	<b>\$(14,029)</b>	<b>\$20,847</b>	<b>\$11,666</b>

Our effective income tax rate differs from the federal statutory rate due to the following:

	2018	2017	2016
Tax provision computed at the federal statutory rate	21.00%	35.00%	35.00%
State income tax provision, net of federal benefit	14.53	2.17	3.93
Federal research credits	14.23	(11.88)	(8.15)
Foreign taxes	(11.45)	(2.27)	(0.34)
Tax-exempt income	0.45	(0.75)	(0.53)
State tax incentives	3.15	(2.71)	(2.77)
Stock-based compensation	(2.87)	1.43	2.53
Domestic production activity deduction	—	(1.13)	(2.23)
Bargain purchase	8.82	—	(2.64)
Impact of U.S. tax reform	12.00	26.70	—
Global intangible low-taxed income (GILTI)	(17.48)	—	—
Other, net	(0.34)	0.09	0.08
<b>Effective Tax Rate</b>	<b>42.04%</b>	<b>46.65%</b>	<b>24.88%</b>

Income (loss) before provision for income taxes for the years ended December 31, 2018, 2017 and 2016 is as follows:

<i>(In thousands)</i>	2018	2017	2016
U.S. entities	\$(74,131)	\$26,552	\$54,077
International entities	40,760	18,135	(7,182)
<b>Total</b>	<b>\$(33,371)</b>	<b>\$44,687</b>	<b>\$46,895</b>

Income (loss) before provision (benefit) for income taxes for international entities reflects income (loss) based on statutory transfer pricing agreements. This amount does not correlate to consolidated international revenues, many of which occur from our U.S. entity.

Deferred income taxes on the balance sheet result from temporary differences between the amount of assets and liabilities recognized for financial reporting and tax purposes. The principal components of our current and non-current deferred taxes are as follows:

<i>(In thousands)</i>	2018	2017
<b>Deferred tax assets</b>		
Inventory	\$6,609	\$7,545
Accrued expenses	2,850	3,103
Investments	1,122	—
Deferred compensation	4,779	5,204
Stock-based compensation	3,069	2,988
Uncertain tax positions related to state taxes and related interest	326	370
Pensions	5,538	4,727
Foreign losses	3,097	3,091
State losses and credit carry-forwards	8,164	3,854
Federal loss and research carry-forwards	17,495	3,058
Valuation allowance	(5,816)	(6,006)
<b>Total Deferred Tax Assets</b>	<b>47,233</b>	<b>27,934</b>
<b>Deferred tax liabilities</b>		
Property, plant and equipment	(3,515)	(3,553)
Intellectual property	(6,531)	(663)
Investments	—	(290)
<b>Total Deferred Tax Liabilities</b>	<b>(10,046)</b>	<b>(4,506)</b>
<b>Net Deferred Tax Assets</b>	<b>\$37,187</b>	<b>\$23,428</b>

On December 22, 2017, the Tax Cuts and Jobs Act (the Act) was signed into law. As a result of the Act, we recognized an estimated expense of \$11.9 million in the fourth quarter of 2017, of which \$9.2 million related to the write-down of deferred tax assets and \$2.7 million related to tax on unrepatriated foreign earnings. We calculated our best estimate of the impact of the Act in our 2017 year-end income tax provision, in accordance with Staff Accounting Bulletin No. 118, which was issued to address the application of U.S. GAAP in situations when a registrant does not have the necessary information available, prepared or analyzed to finalize the accounting for certain income tax effects of the Act. Additional work to complete a more detailed analysis of historical foreign earnings, as well as the full impact relating to the write-down of deferred tax assets, was completed in the third quarter of 2018 and resulted in a tax benefit of \$4.0 million.

At December 31, 2018 and 2017, non-current deferred taxes related to our investments and our defined benefit pension plan reflect deferred taxes on the net unrealized gains and losses on available-for-sale investments and deferred taxes on unrealized losses in our pension plan. The net change in non-current deferred taxes associated with these items, a deferred tax benefit of \$2.8 million and \$1.7 million in 2018 and 2017, respectively, is recorded as an adjustment to other comprehensive income, presented in the Consolidated Statements of Comprehensive Income.

The Company continually reviews the adequacy of the valuation allowance and recognizes the benefits of deferred tax assets only as the reassessment indicates that it is more likely than not that the deferred tax assets will be recognized in accordance with ASC 740, Income Taxes (ASC 740). As of December 31, 2018, we had foreign losses of \$3.1 million. A valuation

allowance of \$2.4 million has been established against the loss carryforwards. The foreign loss carryforwards primarily resulted from an acquisition in 2009. As of December 31, 2018, we had \$8.2 million of state loss and tax credit carryforwards. We believe it is more likely than not we will not realize the full benefit of the deferred tax asset arising from these losses and credit carryforwards. Therefore, a valuation allowance of \$3.4 million has been established against these carryforwards. The valuation allowance relates to a particular state where we no longer generate sufficient state income. As of December 31, 2018, we had \$17.5 million of federal loss and research carryforwards. These carryforwards are the result of acquisitions in 2011 and 2018 as well as domestic operating losses in 2018. Management will continue to assess the realization of our deferred tax assets and related valuation allowance. As such, we may release a portion of the valuation allowance or establish a new valuation allowance based on operations in the jurisdictions in which these assets arose. Management continues to evaluate all evidence including historical operating results, the existence of losses in the most recent year, forecasted earnings, future taxable income, and tax planning strategies. Should management determine a valuation allowance is needed in the future due to not being able to absorb loss carryforwards, it would have a material impact on our consolidated financial statements.

The deferred tax assets for foreign and domestic carry-forwards, research and development tax credits, unamortized research and development costs, and state credit carry-forwards are \$28.8 million. Some of these deferred tax assets will expire between 2019 and 2030 and others carryforward indefinitely. We will continue to assess the realization of our deferred tax assets and related valuation allowances. The net change in our valuation allowance from December 31, 2017, to December 31, 2018 was \$(0.2) million.

As of December 31, 2018, and 2017, respectively, our cash and cash equivalents were \$105.5 million and \$86.4 million and short-term investments were \$3.2 million and \$16.1 million, which provided available short-term liquidity of \$108.7 million and \$102.6 million. Of these amounts, our foreign subsidiaries held cash of \$87.1 million and \$56.8 million, respectively, representing approximately 80.1% and 55.4% of available short-term liquidity, which is used to fund on-going liquidity needs of these subsidiaries. We intend to permanently reinvest these funds outside the U.S., except to the extent any of these funds can be repatriated without withholding tax, and our current business plans do not indicate a need to repatriate to fund domestic operations. However, if all these funds were repatriated to the U.S. or used for U.S. operations, certain amounts could be subject to tax. Due to the timing and circumstances of repatriation of such earnings, if any, it is not practical to determine the amount of funds subject to unrecognized deferred tax liability.

During 2018, 2017 and 2016, we recorded no income tax benefit or expense for stock options exercised as an adjustment to equity. This is calculated on the difference between the exercise price of stock option exercises and the market price of the underlying common stock upon exercise.

The change in the unrecognized income tax benefits for the years ended December 31, 2018, 2017 and 2016 is reconciled below:

<i>(In thousands)</i>	2018	2017	2016
<b>Balance at beginning of period</b>	<b>\$2,366</b>	<b>\$2,226</b>	<b>\$2,537</b>
<b>Increases for tax position related to:</b>			
Prior years	3	465	95
Current year	254	285	428
<b>Decreases for tax positions related to:</b>			
Prior years	—	(14)	—
Settlements with taxing authorities	—	—	—
Expiration of applicable statute of limitations	(755)	(596)	(834)
<b>Balance at end of period</b>	<b>\$1,868</b>	<b>\$2,366</b>	<b>\$2,226</b>

As of December 31, 2018, 2017 and 2016, our total liability for unrecognized tax benefits was \$1.9 million, \$2.4 million and \$2.2 million, respectively, of which \$1.7 million, \$2.2 million and \$1.7 million, respectively, would reduce our effective tax rate if we were successful in upholding all of the uncertain positions and recognized the amounts recorded. We classify interest and penalties recognized on the liability for unrecognized tax benefits as income tax expense. As of December 31, 2018, 2017 and 2016, the balances of accrued interest and penalties were \$0.7 million, \$0.8 million and \$0.8 million, respectively.

We do not anticipate a single tax position generating a significant increase or decrease in our liability for unrecognized tax benefits within 12 months of this reporting date. We file income tax returns in the U.S. federal and various state jurisdictions and several foreign jurisdictions. We are not currently under audit by the Internal Revenue Service. Generally, we are not subject to changes in income taxes by any taxing jurisdiction for the years prior to 2015.

## Note 13 – Employee Benefit Plans

### Pension Benefit Plan

We maintain a defined benefit pension plan covering employees in certain foreign countries.

The pension benefit plan obligations and funded status at December 31, 2018 and 2017, are as follows:

<i>(In thousands)</i>	2018	2017
<b>Change in projected benefit obligation:</b>		
Projected benefit obligation at beginning of period	\$34,893	\$30,011
Service cost	1,193	1,260
Interest cost	727	607
Actuarial loss - experience	38	47
Actuarial gain (loss) - assumptions	2,139	(1,294)
Benefit payments	(138)	(80)
Effects of foreign currency exchange rate changes	(1,615)	4,342
<b>Projected benefit obligation at end of period</b>	<b>37,237</b>	<b>34,893</b>
<b>Change in plan assets:</b>		
Fair value of plan assets at beginning of period	26,624	20,045
Actual return (loss) on plan assets	(2,024)	709
Contributions	688	3,001
Effects of foreign currency exchange rate changes	(1,129)	2,869
<b>Fair value of plan assets at end of period</b>	<b>24,159</b>	<b>26,624</b>
<b>Unfunded status at end of period</b>	<b>\$(13,078)</b>	<b>\$(8,269)</b>

The accumulated benefit obligation was \$37.2 million and \$32.9 million at December 31, 2018 and 2017, respectively. The increase in the accumulated benefit obligation and the actuarial loss is primarily attributable to a decrease in the discount rate during 2018.

The net amounts recognized in the balance sheet for the unfunded pension liability as of December 31, 2018 and 2017 are as follows:

<i>(In thousands)</i>	2018	2017
Current liability	\$ —	\$ —
Non-current liability	13,078	8,269
<b>Total</b>	<b>\$13,078</b>	<b>\$8,269</b>

The components of net periodic pension cost, other than the service cost component, are included in other income (expense), net in the consolidated statements of income (loss). The components of net periodic pension cost and amounts recognized in other comprehensive income (loss) for the years ended December 31, 2018, 2017 and 2016 are as follows:

<i>(In thousands)</i>	2018	2017	2016
<b>Net periodic benefit cost:</b>			
Service cost	\$1,193	\$1,260	\$1,211
Interest cost	727	607	720
Expected return on plan assets	(1,548)	(1,267)	(1,057)
Amortization of actuarial losses	247	309	175
<b>Net periodic benefit cost</b>	<b>619</b>	<b>909</b>	<b>1,049</b>
<b>Other changes in plan assets and benefit obligations recognized in other comprehensive income:</b>			
Net actuarial (gain) loss	5,638	(654)	1,782
Amortization of actuarial losses	(196)	(406)	(156)
<b>Amount recognized in other comprehensive income (loss)</b>	<b>5,442</b>	<b>(1,060)</b>	<b>1,626</b>
<b>Total recognized in net periodic benefit cost and other comprehensive income (loss)</b>	<b>\$6,061</b>	<b>\$(151)</b>	<b>\$2,675</b>

The amounts recognized in accumulated other comprehensive income as of December 31, 2018 and 2017 are as follows:

<i>(In thousands)</i>	2018	2017
Net actuarial loss	\$(11,256)	\$(5,812)

The defined benefit pension plan is accounted for on an actuarial basis, which requires the selection of various assumptions, including an expected rate of return on plan assets and a discount rate. The expected return on our German plan assets that is utilized in determining the benefit obligation and net periodic benefit cost is derived from periodic studies, which include a review of asset allocation strategies, anticipated future long-term performance of individual asset classes, risks using standard deviations, and correlations of returns among the asset classes that comprise the plans' asset mix. While the studies give appropriate consideration to recent plan performance and historical returns, the assumptions are primarily long-term, prospective rates of return.

Another key assumption in determining net pension expense is the assumed discount rate to be used to discount plan obligations. The discount rate has been derived from the returns of high-quality, corporate bonds denominated in Euro currency with durations close to the duration of our pension obligations.

The weighted-average assumptions that were used to determine the net periodic benefit cost for the years ended December 31, 2018, 2017 and 2016 are as follows:

	2018	2017	2016
Discount rates	2.13%	1.90%	2.64%
Rate of compensation increase	2.00%	2.00%	2.00%
Expected long-term rates of return	5.90%	5.90%	5.40%

The weighted-average assumptions that were used to determine the benefit obligation at December 31, 2018 and 2017:

	2018	2017
Discount rates	1.75%	2.13%
Rate of compensation increase	2.00%	2.00%

Actuarial gains and losses are recorded in accumulated other comprehensive income. To the extent unamortized gains and losses exceed 10% of the higher of the market-related value of assets or the projected benefit obligation, the excess is amortized as a component of net periodic pension cost over the remaining service period of active participants. We estimate that \$0.7 million will be amortized from accumulated other comprehensive income into net periodic pension cost in 2019 for the net actuarial loss.

We anticipate making a contribution to the pension plan in 2019 of approximately \$1.1 million which reflects the net amount of service costs less expected benefit payments. The following pension benefit payments, which reflect expected future service, as appropriate, are expected to be paid to participants:

<i>(In thousands)</i>	
2019	\$400
2020	555
2021	646
2022	704
2023	808
2024 – 2028	5,430
<b>Total</b>	<b>\$8,543</b>

We have categorized our cash equivalents and our investments held at fair value that are included in the pension plan into a three-level fair value hierarchy based on the priority of the inputs to the valuation technique for the cash equivalents and investments as follows: Level 1 - values based on unadjusted quoted prices for identical assets or liabilities in an active market; Level 2 - values based on quoted prices in markets that are not active or model inputs that are observable either directly or indirectly; Level 3 - values based on prices or valuation techniques that require inputs that are both unobservable and significant to the overall fair value measurement. These inputs include information supplied by investees.



#### Fair Value Measurements at December 31, 2018, Using

<i>(In thousands)</i>	Fair Value	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Cash and cash equivalents	\$1,010	\$1,010	\$—	\$—
<b>Available-for-sale securities</b>				
Bond funds:				
Government bonds	6,268	6,268	—	—
Corporate bonds	4,840	4,840	—	—
Emerging markets bonds	443	443	—	—
Equity funds:				
Global equity	7,743	7,743	—	—
Emerging markets	1,188	1,188	—	—
Balanced fund	815	815	—	—
Large-cap value	262	262	—	—
Global real estate fund	926	926	—	—
Managed futures fund	664	664	—	—
<b>Available-for-sale securities</b>	<b>23,149</b>	<b>23,149</b>	<b>—</b>	<b>—</b>
<b>Total</b>	<b>\$24,159</b>	<b>\$24,159</b>	<b>\$—</b>	<b>\$—</b>

#### Fair Value Measurements at December 31, 2017, Using

<i>(In thousands)</i>	Fair Value	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Cash and cash equivalents	\$3,005	\$3,005	\$—	\$—
<b>Available-for-sale securities</b>				
Bond funds:				
Corporate bonds	14,349	14,349	—	—
Government bonds	2,305	2,305	—	—
Equity funds:				
Large cap blend	5,758	5,758	—	—
Balanced fund	898	898	—	—
Large cap value	309	309	—	—
<b>Available-for-sale securities</b>	<b>23,619</b>	<b>23,619</b>	<b>—</b>	<b>—</b>
<b>Total</b>	<b>\$26,624</b>	<b>\$26,624</b>	<b>\$—</b>	<b>\$—</b>

Our investment policy includes various guidelines and procedures designed to ensure assets are invested in a manner necessary to meet expected future benefits earned by participants, and consider a broad range of economic conditions. Central to the policy are target allocation ranges by asset class, which is currently 50% for bond funds, 40% for equity funds and 10% cash, real estate and managed futures.

The objectives of the target allocations are to maintain investment portfolios that diversify risk through prudent asset allocation parameters, achieve asset returns that meet or exceed the plans' actuarial assumptions, and achieve asset returns that are competitive with like institutions employing similar investment strategies.

The investment policy is periodically reviewed by us and a designated third-party fiduciary for investment matters. The policy is established and administered in a manner that is compliant at all times with applicable government regulations.

#### **401(k) Savings Plan**

We maintain the ADTRAN, Inc. 401(k) Retirement Plan (Savings Plan) for the benefit of our eligible employees. The Savings Plan is intended to qualify under Sections 401(a) and 401(k) of the Internal Revenue Code of 1986, as amended (Code), and is intended to be a “safe harbor” 401(k) plan under Code Section 401(k)(12). The Savings Plan allows employees to save for retirement by contributing part of their compensation to the plan on a tax-deferred basis. The Savings Plan also requires us to contribute a “safe harbor” amount each year. We match up to 4% of employee contributions (100% of an employee’s first 3% of contributions and 50% of their next 2% of contributions), beginning on the employee’s one-year anniversary date. In calculating our matching contribution, we only use compensation up to the statutory maximum under the Code (\$275,000 for 2018). All contributions under the Savings Plan are 100% vested. Expenses recorded for employer contributions and plan administration costs for the Savings Plan amounted to approximately \$4.4 million, \$4.6 million and \$4.1 million in 2018, 2017 and 2016, respectively.

#### **Deferred Compensation Plans**

We maintain four deferred compensation programs for certain executive management employees and our Board of Directors.

For our executive management employees, the ADTRAN, Inc. Deferred Compensation Program for Employees is offered as a supplement to our tax-qualified 401(k) plan and is available to certain executive management employees who have been designated by our Board of Directors. This deferred compensation plan allows participants to defer all or a portion of certain specified bonuses and up to 25% of remaining cash compensation, and permits us to make matching contributions on a discretionary basis, without the limitations that apply to the 401(k) plan. To date, we have not made any matching contributions under this plan. We also maintain the ADTRAN, Inc. Equity Deferral Program for Employees. Under this plan, participants may elect to defer all or a portion of their vested PSU’s and RSU’s to the Plan. Such deferrals shall continue to be held and deemed to be invested in shares of ADTRAN stock unless and until the amounts are distributed or such deferrals are moved to another deemed investment pursuant to an election made by the Participant.

For our Board of Directors, we maintain the ADTRAN, Inc. Deferred Compensation Program for Directors. This program allows our Board of Directors to defer all or a portion of monetary remuneration paid to the Director, including, but not limited to, meeting fees and annual retainers. We also maintain the ADTRAN, Inc. Equity Deferral Program for Directors. Under this plan, participants may elect to defer all or a portion of their vested restricted stock awards. Such deferrals shall continue to be held and deemed to be invested in shares of ADTRAN stock unless and until the amounts are distributed or such deferrals are moved to another deemed investment pursuant to an election made by the Director.

We have set aside the plan assets for all plans in a rabbi trust (the Trust) and all contributions are credited to bookkeeping accounts for the participants. The Trust assets are subject to the claims of our creditors in the event of bankruptcy or insolvency. The assets of the Trust are deemed to be invested in pre-approved mutual funds as directed by each participant, and the participant’s bookkeeping account is credited with the earnings and losses attributable to those investments. Benefits are scheduled to be distributed six months after termination of employment in a single lump sum payment or annual installments paid over a three or ten-year term based on the participant’s election. Distributions will be made on a pro-rata basis from each of the hypothetical investments of the Participant’s account in cash. Any whole shares of ADTRAN, Inc. common stock that are distributed will be distributed in-kind.

Assets of the Trust are deemed invested in mutual funds that cover an investment spectrum ranging from equities to money market instruments. These mutual funds are publicly quoted and reported at fair value. The fair value of the assets held by the Trust and the amounts payable to the plan participants at December 31, 2018 and 2017, are as follows:

<i>(In thousands)</i>	2018	2017
<b>Fair Value of Plan Assets</b>		
Long-term investments	\$18,256	\$19,883
<b>Total Fair Value of Plan Assets</b>	<b>\$18,256</b>	<b>\$19,883</b>
<b>Amounts Payable to Plan Participants</b>		
Non-current liabilities	\$18,256	\$19,883
<b>Total Amounts Payable to Plan Participants</b>	<b>\$18,256</b>	<b>\$19,883</b>

Interest and dividend income of the Trust have been included in interest and dividend income in the accompanying 2018, 2017 and 2016 Consolidated Statements of Income (Loss). Changes in the fair value of the plan assets held by the Trust have been included in other income (expense) in the accompanying 2018, 2017 and 2016 Consolidated Statements of Income (Loss). Changes in the fair value of the deferred compensation liability are included as selling, general, and administrative expense in the accompanying 2018, 2017 and 2016 Consolidated Statements of Income (Loss). Based on the changes in the total fair value of the Trust's assets, we recorded deferred compensation income (expense) in 2018, 2017 and 2016 of \$2.1 million, \$(2.6) million and \$(1.3) million, respectively.

#### Retiree Medical Coverage

We provided medical, dental and prescription drug coverage to one retired former officer and his spouse, for his life, on the same terms as provided to our active officers, and to the spouse of a former deceased officer for up to 30 years. At December 31, 2018 and 2017, this liability totaled \$0.1 million.

#### Note 14 – Segment Information and Major Customers

Our chief operating decision maker regularly reviews our financial performance based on two reportable segments – Network Solutions and Services & Support. Network Solutions includes software and hardware products and next-generation virtualized solutions used in service provider or business networks, as well as prior-generation products. Services & Support includes our suite of ProCloud managed services, network installation, engineering and maintenance services, and fee-based technical support and equipment repair/replacement plans.

We evaluate the performance of our segments based on gross profit. Selling, general, and administrative expenses, research and development expenses, interest and dividend income, interest expense, net investment gain (loss), other income (expense) and provision (benefit) for taxes are reported on a company-wide, functional basis only. There are no inter-segment revenues.

The following table presents information about the reported sales and gross profit of our reportable segments for each of the years ended December 31, 2018, 2017 and 2016. Asset information by reportable segment is not reported, since we do not produce such information internally.

<i>(In thousands)</i>	2018		2017		2016	
	Sales	Gross Profit	Sales	Gross Profit	Sales	Gross Profit
Network Solutions	\$458,232	\$179,303	\$540,396	\$260,833	\$525,502	\$254,797
Services & Support	71,045	24,262	126,504	42,802	111,279	36,533
<b>Total</b>	<b>\$529,277</b>	<b>\$203,565</b>	<b>\$666,900</b>	<b>\$303,635</b>	<b>\$636,781</b>	<b>\$291,330</b>

#### Sales by Category

In addition to the above reporting segments, we also report revenue for the following three categories – Access & Aggregation, Subscriber Solutions & Experience, and Traditional & Other Products.

The following tables disaggregates our revenue by major source for the years ended December 31, 2018, 2017 and 2016:

<i>(In thousands)</i>	2018		
	Network Solutions	Services & Support	Total
Access & Aggregation	\$301,801	\$57,069	\$358,870
Subscriber Solutions & Experience <sup>(1)</sup>	129,067	5,393	134,460
Traditional & Other Products	27,364	8,583	35,947
<b>Total</b>	<b>\$458,232</b>	<b>\$71,045</b>	<b>\$529,277</b>

<i>(In thousands)</i>	2017		
	Network Solutions	Services & Support	Total
Access & Aggregation	\$361,955	\$111,989	\$473,944
Subscriber Solutions & Experience <sup>(1)</sup>	132,294	6,162	138,456
Traditional & Other Products	46,147	8,353	54,500
<b>Total</b>	<b>\$540,396</b>	<b>\$126,504</b>	<b>\$666,900</b>

	2016		
<i>(In thousands)</i>	Network Solutions	Services & Support	Total
Access & Aggregation	\$339,451	\$96,921	\$436,372
Subscriber Solutions & Experience <sup>(1)</sup>	130,645	6,963	137,608
Traditional & Other Products	55,406	7,395	62,801
<b>Total</b>	<b>\$525,502</b>	<b>\$111,279</b>	<b>\$636,781</b>

<sup>(1)</sup> *Subscriber Solutions & Experience was formerly reported as Customer Devices. With the increasing focus on enhancing the customer experience for both our business and consumer broadband customers and the addition of SmartRG during the fourth quarter of 2018, Subscriber Solutions & Experience more accurately represents this revenue category.*

The following table presents sale information by geographic area for the years ended December 31, 2018, 2017 and 2016.

<i>(In thousands)</i>	2018	2017	2016
United States	\$288,843	\$508,178	\$501,337
Germany	167,251	119,502	85,780
Other international	73,183	39,220	49,664
<b>Total</b>	<b>\$529,277</b>	<b>\$666,900</b>	<b>\$636,781</b>

Customers comprising more than 10% of revenue can change from year to year. Single customers comprising more than 10% of our revenue in 2018 included two customers at 27% and 17%. Single customers comprising more than 10% of our revenue in 2017 included two customers at 40% and 16%. Single customers comprising more than 10% of our revenue in 2016 included three customers at 24%, 19% and 12%. Other than those with more than 10 percent of revenues disclosed above, and excluding distributors, our next five largest customers can change from year-to-year. These customers represented 18%, 15% and 13% of total revenue in 2018, 2017 and 2016, respectively.

#### **Additional Segment Information**

As of December 31, 2018, long-lived assets, net totaled \$80.6 million, which includes \$77.3 million held in the U.S. and \$3.3 million held outside the U.S. As of December 31, 2017, long-lived assets, net totaled \$85.1 million, which includes \$80.6 million held in the U.S. and \$4.5 million held outside the U.S.

#### **Note 15 – Commitments and Contingencies**

In the ordinary course of business, we may be subject to various legal proceedings and claims, including employment disputes, patent claims, disputes over contract agreements and other commercial disputes. In some cases, claimants seek damages or other relief, such as royalty payments related to patents, which, if granted, could require significant expenditures. Although the outcome of any claim or litigation can never be certain, it is our opinion that the outcome of all contingencies of which we are currently aware will not materially affect our business, operations, financial condition, or cash flows.

We have committed to invest up to an aggregate of \$7.9 million in two private equity funds, and we have contributed \$8.4 million as of December 31, 2018, of which \$7.7 million has been applied to these commitments.

We lease office space and equipment under operating leases which expire at various dates through 2025. As of December 31, 2018, future minimum rental payments under non-cancelable operating leases, including renewals determined to be reasonably assured, with original maturities of greater than 12 months are as follows:

<i>(In thousands)</i>	
2019	\$3,873
2020	3,580
2021	2,771
2022	2,053
2023	1,317
Thereafter	762
<b>Total</b>	<b>\$14,356</b>

Rental expense was \$4.6 million, \$4.7 million and \$4.5 million for the years ended December 31, 2018, 2017 and 2016, respectively.

### Note 16 – Earnings (Loss) per Share

A summary of the calculation of basic and diluted earnings (loss) per share for the years ended December 31, 2018, 2017 and 2016 is as follows:

<i>(In thousands, except for per share amounts)</i>	2018	2017	2016
<b>Numerator</b>			
Net Income (Loss)	\$(19,342)	\$23,840	\$35,229
<b>Denominator</b>			
Weighted average number of shares—basic	47,880	48,153	48,724
Effect of dilutive securities:			
Stock options	—	406	170
Restricted stock and restricted stock units	—	140	55
<b>Weighted average number of shares—diluted</b>	<b>47,880</b>	<b>48,699</b>	<b>48,949</b>
Earnings (loss) per share—basic	\$(0.40)	\$0.50	\$0.72
Earnings (loss) per share—diluted	\$(0.40)	\$0.49	\$0.72

For each of the years ended December 31, 2018, 2017 and 2016, 2.5 million, 3.2 million and 4.6 million stock options were outstanding but were not included in the computation of diluted earnings (loss) per share because the options' exercise prices were greater than the average market price of the common shares, therefore making them anti-dilutive under the treasury stock method. As a result of the net loss for the year ended December 31, 2018, we excluded 0.1 million of unvested stock options, PSU's, RSU's and restricted stock from the calculation of diluted EPS due to their anti-dilutive effect.

### Note 17 – Summarized Quarterly Financial Data (Unaudited)

The following table presents unaudited quarterly operating results for each of our last eight fiscal quarters. This information has been prepared on a basis consistent with our audited financial statements and includes all adjustments, consisting only of normal recurring adjustments, considered necessary for a fair presentation of the data.

#### Unaudited Quarterly Operating Results

*(In thousands, except for per share amounts)*

Three Months Ended	March 31, 2018	June 30, 2018	September 30, 2018	December 31, 2018
Net sales	\$120,806	\$128,048	\$140,335	\$140,088
Gross profit	\$39,733	\$49,996	\$58,448	\$55,388
Operating income (loss)	\$(26,647)	\$(12,813)	\$(2,179)	\$(3,783)
Net income (loss)	\$(10,814)	\$(7,670)	\$7,589	\$(8,447)
Earnings (loss) per common share	\$(0.22)	\$(0.16)	\$0.16	\$(0.18)
Earnings (loss) per common share assuming dilution <sup>(1)</sup>	\$(0.22)	\$(0.16)	\$0.16	\$(0.18)
Three Months Ended	March 31, 2017	June 30, 2017	September 30, 2017	December 31, 2017
Net sales	\$170,279	\$184,673	\$185,112	\$126,836
Gross profit	\$73,709	\$84,626	\$86,491	\$58,809
Operating income (loss)	\$6,949	\$16,363	\$18,227	\$(4,153)
Net income (loss)	\$6,651	\$12,401	\$15,898	\$(11,110)
Earnings (loss) per common share	\$0.14	\$0.26	\$0.33	\$(0.23)
Earnings (loss) per common share assuming dilution <sup>(1)</sup>	\$0.14	\$0.26	\$0.33	\$(0.23)

<sup>(1)</sup> Assumes exercise of dilutive stock options calculated under the treasury stock method.

## Note 18 – Subsequent Events

On January 23, 2019, the Board declared a quarterly cash dividend of \$0.09 per common share to be paid to shareholders of record at the close of business on February 7, 2019. The quarterly dividend payment was \$4.3 million and was paid on February 21, 2019. In July 2003, our Board of Directors elected to begin declaring quarterly dividends on our common stock considering the tax treatment of dividends and adequate levels of Company liquidity.

During the first quarter and as of February 26, 2019, we have repurchased 13,000 shares of our common stock through open market purchases at an average cost of \$14.06 per share. We currently have the authority to purchase an additional 2.5 million shares of our common stock under the current plan approved by the Board of Directors.

In February 2019, \$1.0 million of an outstanding investment loan due to ADTRAN was replaced with a secured loan in that amount. The remaining balance of this investment loan was converted to participating preferred shares of the respective company.

In February 2019, we announced the restructuring of our workforce in Germany, which includes the closure of the office location in Munich, Germany accompanied by relocation or severance benefits for the affected employees and a voluntary early retirement offering to certain other employees. The restructuring is expected to be completed in the fourth quarter of 2019. ADTRAN does not have sufficient information currently on which to estimate the liability associated with this restructuring, including costs associated with employee severance and relocation.

On February 25, 2019, one of the Company's customers filed for voluntary Chapter 11 bankruptcy as a result of a court ruling resulting in a substantial legal judgment against the customer. In 2018, this customer accounted for less than 5% of the Company's revenue. As of December 31, 2018, the Company had \$2.6 million related to product and services revenue and \$0.3 million related to a leased equipment arrangement included in accounts receivable on the Consolidated Balance Sheet that was due from this customer. As of December 31, 2018, the Company had \$9.4 million included in other receivables related to a leased equipment arrangement on its Consolidated Balance Sheet that was due from this customer. Since December 31, 2018, and through the date of this filing, all \$2.6 million of the outstanding products and services accounts receivable and \$0.1 million of the outstanding accounts receivable related to leased equipment have been collected. Additionally, \$1.7 million of the outstanding other receivables related to leased equipment have been collected. Therefore, there is potential risk of uncollectibility up to \$7.8 million on the remaining outstanding receivable balances as of December 31, 2018. The Company has evaluated the collectibility of the remaining receivable balances with the best available and applicable information as of the date of this filing and the impact was not material to the consolidated financial statements as of December 31, 2018. The Company will continue to evaluate the collectibility of the remaining accounts receivable balances in subsequent reporting periods. Additionally, it is uncertain at this time the impact this voluntary bankruptcy filing might have on the Company's operating income prospectively; however, the Company believes it will not have a significant impact on the Company's liquidity and capital resources.

# Directors and Executive Officers

**Thomas R. Stanton**

Chairman and Chief Executive Officer

**H. Fenwick Huss**

Director of the Company  
Willem Kooyker Dean of the Zicklin School  
of Business at Baruch College

**William L. Marks**

Director of the Company  
Former Chairman of the Board and Chief Executive  
Officer of Whitney Holding Corp. (the holding company  
for Whitney National Bank of New Orleans)

**Gregory McCray**

Director of the Company  
CEO of FDH

**Anthony J. Melone**

Director of the Company  
Former Executive Vice President and Chief Technology  
Officer for Verizon Communications

**Balan Nair**

Director of the Company  
President and Chief Executive Officer of  
Liberty Latin America

**Jacqueline H. Rice**

Director of the Company  
Principal of RH Associates

**Kathryn A. Walker**

Director of the Company  
Managing Director for OpenAir Equity Partners

**Roy J. Nichols**

Director Emeritus  
Founder and former President of  
Nichols Research Corporation

**Michael K. Foliano**

Senior Vice President  
Operations

**John Neville**

Senior Vice President  
Sales

**Eduard Scheiterer**

Senior Vice President  
Research and Development

**Roger D. Shannon**

Senior Vice President of Finance,  
Chief Financial Officer,  
Corporate Secretary and Treasurer

**James D. Wilson, Jr.**

Senior Vice President  
Technology and Strategy

**Raymond Harris**

Chief Information Officer

**Paul Sykes**

General Counsel

**Transfer Agent**

American Stock Transfer and Trust Company  
New York, NY

**Independent Registered Public Accounting Firm**

PricewaterhouseCoopers LLP  
Birmingham, Alabama

**Outside Counsel**

Dentons US LLP  
Atlanta, Georgia

Trusted Counsel Ashley LLC

Atlanta, Georgia

**Form 10-K**

ADTRAN's 2018 Annual Report on Form 10-K  
(without exhibits) as filed with the Securities and  
Exchange Commission is available to stockholders  
without charge upon written request to:

Investor Relations

ADTRAN, Inc.

901 Explorer Blvd.

P.O. Box 140000

Huntsville, Alabama 35814-4000

256 963-8220

investorrelations@adtran.com (email)

**Annual Meeting**

The 2019 Annual Meeting of Stockholders will be held  
at ADTRAN corporate headquarters, 901 Explorer  
Boulevard, Huntsville, Alabama, on Wednesday,  
May 8, 2019, at 10:30 a.m. Central time.









## **Corporate Headquarters**

ADTRAN, Inc.  
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P.O. Box 140000  
Huntsville, AL 35814-4000  
1 800 9ADTRAN  
1 256 963-8000  
1 256 963-8004 fax  
*investor.relations@adtran.com*  
*www.adtran.com*

## **International Offices**

ADTRAN Networks Pty. Ltd.  
Melbourne, Australia

ADTRAN Canada, Inc.  
Montreal, Canada

ADTRAN GmbH  
Berlin, Greifswald,  
and Munich, Germany

ADTRAN M.E.P.E.  
Athens, Greece

ADTRAN Networks India Private Ltd.  
Hyderabad, India

ADTRAN Holdings Ltd.  
Tel Aviv, Israel

ADTRAN S.R.L.  
Milan, Italy

ADTRAN Networks Sdn. Bhd.  
Penang, Malaysia

ADTRAN Networks S.A. de C.V.  
Mexico City, Mexico

ADTRAN Networks & Services S. de R.L. de C.V.  
Mexico City, Mexico

ADTRAN Sp. z.o.o.  
Warsaw, Poland

Saudi Arabian Branch of ADTRAN International, Inc.  
Riyadh, Saudi Arabia

ADTRAN s.r.o.  
Bratislava, Slovakia

ADTRAN GmbH Permanent Establishment  
Tunis, Tunisia

ADTRAN Europe Limited  
Basingstoke, Hampshire, United Kingdom