UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-K

(Mark One)

x ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the Fiscal Year Ended December 31, 2019
or

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from to

Commission file number 001-32358

SPOK HOLDINGS, INC.

(Exact name of registrant as specified in its charter)

DELAWARE	**16-1694797**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
6850 Versar Center, Suite 420 Springfield, Virginia	**22151-4148**
(Address of principal executive offices)	(Zip Code)

(800) 611-8488
(Registrant's telephone number, including area code)

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

Title of each class	Trading Symbol	Name of each exchange on which registered
Common Stock, par value $0.0001 per share	SPOK	NASDAQ National Market®

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

None

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

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

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

Indicate by check mark whether the registrant has submitted electronically, every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). YES x NO ☐

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

Large accelerated filer	☐	Accelerated filer	x
Non-accelerated filer	☐	Smaller reporting company	☐
		Emerging growth company	☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). YES ☐ NO x

The aggregate market value of the common stock held by non-affiliates of the registrant was $289 million based on the closing price of $15.04 per share on the NASDAQ National Market® on June 28, 2019.

The number of shares of registrant's common stock outstanding on February 21, 2020 was 18,944,914.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Definitive Proxy Statement for the 2020 Annual Meeting of Stockholders of the registrant, which will be filed with the Securities and Exchange Commission pursuant to Regulation 14A no later than April 29, 2020, are incorporated by reference into Part III of this Report.

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Forward-Looking Statements

This Annual Report on Form 10-K contains forward-looking statements and information relating to Spok Holdings, Inc. and its subsidiaries ("Spok" or the "Company") that set forth anticipated results based on management's current plans, known trends and assumptions. These statements are made pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. Statements that are predictive in nature, that depend upon or refer to future events or conditions, or that include words such as "anticipate," "believe," "estimate," "expect," "intend," "will," "target," "forecast" and similar expressions, as they relate to Spok, are forward-looking statements.

Although these statements are based upon current plans, known trends and assumptions that management considers reasonable, they are subject to certain risks, uncertainties and assumptions, including but not limited to the following:

- Continuing decline in the number of paging units we have in service with customers, commensurate with a continuing decline in our wireless revenue
- The sales cycle of our software solutions and services can run from six to eighteen months, making it difficult to plan for and meet our sales objectives and bookings on a steady basis quarter-to-quarter and year-to-year
- Our ability to manage wireless network rationalization to lower our costs without causing disruption of service to our customers
- Our ability to design and develop an integrated clinical communications and collaboration platform to address mobile communications, clinical alerting, nursing and workflow functions at state of the art hospitals that gains market acceptance and wide-spread use by customers
- Our ability to address changing market conditions with new or revised software solutions
- Our ability to retain key management personnel and to attract and retain talent within the organization
- Our ability to manage change related to regulation, including laws and regulations affecting hospitals and the healthcare industry generally
- Competition for our services and products from new technologies or those offered and/or developed from firms that are substantially larger and have much greater financial and human capital resources
- The reliability of our networks and servers and our ability to prevent cyber-attacks and other security issues and disruptions
- We may experience litigation claiming intellectual property infringement by us, and we may not be able to protect our rights in intellectual property that we own and develop
- Unauthorized breaches or failures in cybersecurity measures adopted by us and/or included in our products and services
- Declines in our stock price or other events or circumstances that result in future goodwill impairments
- Those matters are discussed in this Annual Report under Item 1A "Risk Factors."

Should known or unknown risks or uncertainties materialize, known trends change, or underlying assumptions prove inaccurate, actual results or outcomes may differ materially from past results and those described herein as anticipated, believed, estimated, expected, intended, targeted or forecasted. Investors are cautioned not to place undue reliance on these forward-looking statements.

The Company undertakes no obligation to update forward-looking statements. Investors are advised to consult all further disclosures the Company makes in its subsequent reports on Form 10-Q and Form 8-K that it will file with the United States Securities and Exchange Commission ("SEC"). Also note that, in the risk factors section, the Company provides a cautionary discussion of risks, uncertainties and possibly inaccurate assumptions relevant to its business. These are factors that, individually or in the aggregate, could cause the Company's actual results to differ materially from past results as well as those results that may be anticipated, believed, estimated, expected, intended, targeted or forecasted. It is not possible to predict or identify all such risk factors. Consequently, investors should not consider the risk factor discussion to be a complete discussion of all of the potential risks or uncertainties that could affect Spok's business, statement of operations or financial condition, subsequent to the filing of this Annual Report.

PART I

The terms "we," "us," "our," "Company" and "Spok" refer to Spok Holdings, Inc. and its direct and indirect wholly owned subsidiaries.

ITEM 1. *BUSINESS*

Overview

Spok, Inc., a wholly owned subsidiary of Spok Holdings, Inc. (NASDAQ: SPOK), is proud to be the global leader in healthcare communications. We deliver clinical information to care teams when and where it matters most to improve patient outcomes. Top hospitals rely on Spok Care Connect to enhance workflows for clinicians, support administrative compliance, and provide a better experience for patients.

Our headquarters is located at 6850 Versar Center, Suite 420, Springfield, Virginia 22151, and our telephone number is 800-611-8488. We maintain an Internet website at http://www.spok.com. (This website address is for information only and is not intended to be an active link or to incorporate any website information into this 2019 Annual Report on Form 10-K ("2019 Form 10-K").)

We deliver smart, reliable clinical communication and collaboration solutions to help protect the health, well-being, and safety of people in the United States and abroad, on a limited basis, in Europe, Canada, Australia, Asia and the Middle East. Our customers rely on Spok for workflow improvement, secure texting, paging services, contact center optimization, and public safety response. We develop, sell, and support enterprise-wide systems primarily for healthcare and other organizations needing to automate, centralize, and standardize their approach to clinical communications. Our solutions can be found in prominent hospitals, large government agencies, leading public safety institutions, colleges and universities; large hotels, resorts and casinos; and well-known manufacturers. We offer our services and products to three major market segments: healthcare, government, and large enterprise, with a greater emphasis on the healthcare market segment.

We have identified hospitals with 200 or more beds as the primary targets for our software solutions as well as our paging services. Within this market, we have identified the following dynamics and have focused our efforts to address these dynamics:

- a heightened awareness of the ubiquitous, critical role of communications in healthcare;
- an increased focus within hospitals on quality of care and patient safety initiatives;
- the importance of confidentiality when sharing information;
- increased regulations that may result in process changes, increased documentation and reporting and increased costs;
- a continuing focus within hospitals to reduce labor and administrative costs while increasing productivity; and
- a broader proliferation of information technology in healthcare as hospitals strive to apply technology to solve their business problems.

Industry Overview

The United States healthcare market continues to experience significant change. Healthcare costs continue to rise, reimbursements from Centers for Medicare and Medicaid Services are being reduced in certain areas, digitization of healthcare information continues and the healthcare industry continues to shift towards a value-based purchasing model and away from the traditional fee-for-service model. The value-based purchasing model places an emphasis on incentivizing value and quality at an individual patient level in order to provide better patient outcomes and reduce 30-day readmissions.

In response, healthcare providers will require greater communication and collaboration between clinicians in order to create improvements in patient care quality, safety, satisfaction and efficiency. Improvements in these areas are necessary for healthcare providers to successfully navigate many of these issues. Many providers are seeking improvement through the adoption of technology, looking to take advantage of automation, workflows, process improvement and in limited circumstances machine learning or artificial intelligence. Providers also look to increase efficiencies through consolidation as larger health systems continue to acquire smaller hospitals for the primary purpose of gaining regional market share amongst tough competition.

We believe these changes and continued pressures place greater emphasis on the need for better communication and collaboration tools to meet the increasing requirements demanded by the healthcare industry in today’s marketplace. Our solutions help hospitals significantly increase patient care quality, safety and satisfaction while simultaneously increasing employee productivity, reducing costs and reducing clinician burnout. This is done through workflow enhancement, secure, reliable and integrated communication tools and mobile accessibility.

Sales and Marketing

Sales. We market and distribute our clinical communication and collaboration solutions through a direct sales force and an indirect sales channel.

The direct sales force contracts or sells products, solutions, messaging services and other services directly to customers ranging from small and medium-sized businesses to companies in the Fortune 1000, healthcare and related businesses, and Federal, state, and local government agencies. We will continue to market primarily to commercial enterprises, with a focus on healthcare organizations, interested in our communication solutions. We maintain a sales presence in key markets throughout the United States, and in limited markets internationally including our Asia-Pacific sales team, in an effort to gain new customers and to retain and increase sales to existing customers. The direct sales force targets leadership responsible for the procurement of clinical communication and collaboration solutions such as chief information officers, chief technology officers, chief medical officers, chief nursing officers, information technology directors, telecommunications directors, and contact center managers. The timing for a direct sale varies but may take from six to 18 months depending on the type and scope of software solution.

The indirect sales force complements our direct sales force. Through relationships with alliance partners we are able to sell our solutions to a wider customer base. For paging services that we do not provide directly, we contract with and invoice an intermediary for airtime services. For our software sales, our relationships with alliance partners assist us in broadening the distribution of our products and further diversifying into markets outside healthcare.

Marketing. We have a centralized marketing function, which is focused on supporting our solutions and sales efforts by strengthening our corporate brand, generating sales leads, and facilitating the sales process. Our principal marketing programs include:

- Content marketing (eBriefs, case studies, brochures, videos, infographics, and more) as an underlying foundation of all marketing campaigns or initiatives;
- Website development and maintenance, which provides product and Company information, customer support options, paging capabilities, as well as thought leadership and engagement;
- Participation at trade shows and industry events, such as Healthcare Information and Management Systems Society, College of Healthcare Information Management Executives, Association of Medical Directors of Information Systems, American Organization of Nurse Leaders, and other Healthcare Information technology related shows and conferences;
- Webinars about customer successes, current industry trends, and our solutions;
- Social media involvement to provide information regarding upcoming educational events or new product offerings;
- Industry analyst relationships;
- Newsletters and blog posts to provide information about industry trends and our solutions to customers, prospects, and alliances; and
- Annual customer conferences that solicit feedback on our solutions and services.

Licenses and Messaging Networks

In order to provide our wireless services, we hold licenses to operate on various frequencies in the 900 MHz narrowband. We are licensed by the United States Federal Communications Commission (the “FCC”) to operate Commercial Mobile Radio Services (“CMRS”). These licenses are required to provide one-way and two-way messaging services over our networks.

We operate local, regional and nationwide one-way networks, which enable subscribers to receive messages over a desired geographic area. One-way networks operating in 900 MHz frequency bands utilize the FLEX™ protocol developed by Motorola Mobility, Inc. (“Motorola”). The FLEX™ protocol has advantages of functioning at higher network speeds (which increases the volume of messages that can be transmitted over the network) and of having more robust error correction (which facilitates message delivery to a device with fewer transmission errors).

Our two-way networks utilize the ReFLEX 25™ protocol, also developed by Motorola. ReFLEX 25™ promotes spectrum efficiency and high network capacity by dividing coverage areas into zones and sub-zones. Messages are directed to the zone or sub-zone where the subscriber is located, allowing the same frequency to be reused to carry different traffic in other zones or sub-zones. As a result, the ReFLEX 25™ protocol allows the two-way network to transmit substantially more messages than a one-way network using the FLEX™ protocols. The two-way network also provides for assured message delivery. The network stores, for a limited amount of time, messages that could not be delivered to a device that is out of coverage for any reason, and when the unit returns to service, those messages are delivered. The two-way paging network operates under a set of licenses called narrowband Personal Communications Service, which uses 900 MHz frequencies. These licenses require certain minimum five and ten-year build-out commitments established by the FCC, which have been satisfied.

Although the capacities of our networks vary by geographic area, we have excess capacity at a consolidated level. We have implemented a plan to manage network capacity and to improve overall network efficiency by consolidating subscribers onto fewer, higher capacity networks with increased transmission speeds. This plan is referred to as network rationalization. Network rationalization will result in fewer networks and therefore fewer transmitter locations, which we believe will result in lower operating expenses due primarily to lower site rent expenses. As we continue to implement our network rationalization plan, we expect to have fewer transmitters that can be removed efficiently from our networks and still maintain the level of service required for our customers, and thus the benefits of network rationalization will decline. We expect related cost savings will begin to slow in 2019 as compared to historical cost savings. As we reach certain minimum frequency commitments, as outlined by the FCC, we will be limited in our ability to continue our efforts to rationalize and consolidate our networks. Our messaging networks and related infrastructure are located exclusively in the United States.

Generally, our software solutions do not require licenses or permits from Federal, state and/or local government agencies in order to be sold to customers. However, certain of our software products are subject to regulation by the United States Food and Drug Administration ("FDA") and are subject to certification by the Joint Interoperability Test Command to be sold to the branches of the armed services of the United States and the United States government. (see “Regulation” below).

Our Strategy

Our goal is to continue to execute on our vision of integrated communication and collaboration enterprise solutions. In doing so, we will strengthen our core product offerings and offer new solutions as we continue to focus on serving the mission critical needs of our customers, while operating an efficient and profitable business strategy.

Critical aspects of our strategy include:

Growth of our software revenue and bookings — We expect to continue to increase our investment in sales and marketing, product implementation, product development and customer support to drive software, services and maintenance bookings and revenue growth. We will continue to focus our sales and marketing efforts in the healthcare market in order to identify opportunities for sales and close those opportunities in the form of bookings.

We have an ongoing initiative to further penetrate the hospital segment in the United States and while we believe there is a significant opportunity to sell clinical communication and collaboration solutions to hospitals located outside the United States our focus is on the domestic market. We intend to leverage the strength of our market presence and the breadth of our product offerings to further expand our customer base in healthcare.

The introduction of Spok Go® is a key initiative that we are focused on in 2020. While we do not anticipate material revenues in 2020, we believe Spok Go is the basis for future growth of our software revenue and bookings. Further details on Spok Go can be found under "Spok Go platform".

Retention of our wireless subscribers and revenue stream — We will continue to focus on reducing the rate of subscriber disconnects and minimize the rate of wireless revenue erosion. We continue to have a valuable wireless presence in the healthcare market, particularly in larger hospitals. We offer a comprehensive suite of wireless messaging products and services focused on healthcare and “campus” type environments and critical mission notification. We will continue to focus on network reliability and customer service to help minimize the rate of subscriber disconnects.

We recognize that the number of wireless subscribers, units in service, and the related revenue will continue to decline. We intend to continue reducing our underlying cost structure impacting this declining wireless revenue stream by reducing payroll and related expenses as well as network related expenses where possible. We will integrate and consolidate operations as necessary to ensure the lowest cost operational platform for our consolidated business.

Invest in our future solutions — The market for clinical communication and collaboration solutions is expected to grow as healthcare continues to change. Focus on patient satisfaction, population health management, reimbursement changes and emphasis on quality improvement and care coordination are all driving an evolution in communication and collaboration between previously disparate departments and systems within and outside hospitals and across the healthcare ecosystem. Maintaining our position as a leader in healthcare communication and collaboration requires us to continue development of the Spok Go platform and invest in key areas of customer need including: 1) mobility, 2) integrated platform, 3) nursing and physician solutions and 4) alerting.

Investment in our future solutions is discussed in further detail under "Spok Go Platform."

Return capital to our stockholders — We understand that our primary objective is to create long-term stockholder value. We will continue to evaluate how best to deploy our capital resources to support sustainable business growth and maximize stockholder value. We expect to continue to pay a quarterly dividend of $0.125 per share of common stock or $0.50 annually in 2020. We will continue to evaluate both market and Company factors to determine whether a common stock repurchase program is an appropriate method to return capital to our stockholders.

To ensure focus on our business strategy we establish specific performance objectives and develop short-term and long-term incentive plans (“STIP” and "LTIP," respectively) for our management that include a combination of these operating objectives and priorities.

Our Products and Services

Wireless products and related services. We offer subscriptions to one-way or two-way messaging services for a periodic (monthly, quarterly, semi-annual, or annual) service fee. The level of service fees is generally based upon the type of service provided, the geographic area covered, the number of devices provided to the customer and the period of commitment. A subscriber to one-way messaging services may select coverage on a local, regional, or nationwide basis to best meet their messaging needs. Two-way messaging is generally offered on a nationwide basis. In addition, subscribers either contract for a messaging device from us for an additional fixed monthly fee or they own a device, having purchased it either from us or from another vendor. We also sell devices to resellers who lease or resell them to their subscribers and then sell messaging services utilizing our networks. We offer ancillary services, such as voicemail and equipment loss or maintenance protection, which help increase the monthly recurring revenue we receive along with these traditional messaging services. We offer exclusive one-way (T5) and two-way (T52) alphanumeric pagers which are configurable to support un-encrypted or encrypted operation. When configured for encryption, they utilize AES-128 bit encryption, screen locking and remote wipe capabilities. With encryption enabled these secure paging devices enhance our service offerings to the healthcare community by adding Health Insurance Portability and Accountability Act ("HIPAA") security capabilities to the low cost, highly reliable and availability benefits of paging.

The demand for one-way and two-way messaging services declined during the years ended December 31, 2019, 2018 and 2017, and we believe demand will continue to decline for the foreseeable future. Wireless products and services revenue represented 55%, 56% and 59% of total consolidated revenue for the years ended December 31, 2019, 2018 and 2017, respectively. As demand for one-way and two-way messaging has declined, we have developed or added service offerings in order to increase our revenue potential and mitigate the decline in our wireless revenues. We will continue to evaluate opportunities to provide customers the highest value possible.

Software. Dependable clinical communications are paramount for individuals in healthcare and a host of other industries. We offer a number of solutions, providing our customers with the ability to communicate anywhere, anytime across a number of situations. Our solutions are used for contact centers, clinical alerting and notification, mobile communications and messaging, and for public safety notifications.

***Spok Go* Platform**

We continue to focus our product development activities on developing our clinical communication and collaboration platform, Spok Go. Development of Spok Go has spanned several years, as we have worked to create an integrated cloud-native platform that is built on a foundation of a single, best-in-class architecture. Spok Go is an enterprise solution that will include secure messaging, global directory, on-call scheduling and workflow automation when first made available to customers in 2020. Building Spok Go from the ground-up has allowed us to place an emphasis on mobile accessibility from the beginning. Mobile accessibility is a core component of the platform and developing Spok Go with a focus on mobile application ensures that users will experience seamless transitions between mobile technologies and integrated applications, whether they are in the hospital or "on the go”. Providing Software-as-a-Service (“SaaS”) will allow for our customers to receive updates and enhancements seamlessly as they are released by the Company. Hosting and security will be handled through our partnership with Amazon Web Services® (“AWS”). AWS will provide the core infrastructure for Spok Go through AWS hosting, ensuring that customers will have access to the most current and secured technologies when it comes to a hosted environment where security is critical to our customers.

Currently our Care Connect Suite ("CCS") implementations average seven to eight months from when a contract is signed through completion. With the introduction of Spok Go, implementation times will be significantly reduced for customers so that they can begin realizing the benefits of an installed solution much quicker than ever before. Building Spok Go as a cloud-native solution comprised of a single architecture will allow for expedited implementations of the solution as the complexity of installation and configuration has been significantly reduced.

We anticipate future development of new functionality and enhancements will be driven by specific market needs along with our desire to expand into other service lines such as radiology, contact center and, emergency department. We expect our close and trusted relationships with our customers will be sources for new use cases, features and solutions. Our product strategy team assesses these customer needs, conducts industry-based research and helps to ensure new releases are designed to have immediate, broad applicability, a strong value proposition and a high return on investment for both Spok and our customers.

As previously mentioned, the shift to value-based healthcare, unsustainable growth in healthcare costs and the general move towards a digital world has driven the healthcare industry towards technology in hopes of creating more efficiencies that will reduce pressure on their bottom line and increase patient care quality, safety and satisfaction. Spok Go will provide a significant value proposition for potential customers by delivering efficiencies in clinical communication and collaboration through improvements in secure messaging, workflow and automation which will ultimately lead to improvements in clinical and quality outcomes.

While we anticipate initial sales from Spok Go in 2020, these sales will largely be with new customers as opposed to the transition of existing customers. We also do not expect to recognize material revenues from Spok Go for the same period. Revenues recognized from the sale of Spok Go will be recognized ratably over the terms of the contract and thus will generally lag behind actual sales (as opposed to the immediate recognition of license revenues when a perpetual or term license is sold).

Care Connect Suite

Contact Center

- **Spok® Healthcare Console:** Provides operators with the information needed to process calls using their computers with just a few keystrokes. This solution integrates with the customers' existing phone systems and is used by the operator group to answer incoming calls to the contact center. Operators can quickly and accurately perform directory searches and code calls, as well as messaging and paging by individual, groups, and roles using the Spok Healthcare Console's computer telephony integration and directory capabilities.
- **Spok® Web-Based Directory:** Makes employee contact information more accessible and enables staff to send messages quickly right from the directory. Authenticated users can log on anywhere, anytime to perform a variety of important updates to contact information and on-call schedules, search the directory, and send important messages.
- **Spok® Web-Based On-Call Scheduling:** Keeps personnel, calendars and on-call scheduling information updated, even with thousands of staff, using a secure web portal to maintain and allow password-protected access to the latest on-call schedules and personnel information.
- **Spok® Speech:** Enables the organization to process routine phone requests, including transfers, directory assistance, messaging and paging without live operators and with more ease-of-use than touchtone menus.
- **Spok® Call Recording and Quality Management:** Records, monitors, and scores operators' conversations to allow for better management of calls, helping improve customer service.

Clinical Alerting

- **Spok® Messenger:** Provides an intelligent, FDA, 510(k)-cleared solution that connects virtually all crucial alert systems, including nurse call, fire, security, patient monitoring, and building management to mobile staff via their wireless communication devices. This solution provides the ability to reach mobile team members within seconds of an alert, improving overall workflow, staff productivity, and the comfort and safety of everyone in the facility.
- **Spok® e.Notify:** Enables organizations to quickly and reliably notify and confirm team member availability during emergency situations without relying on calling trees, thereby reducing confusion that may arise in an emergency situation. This solution automatically delivers messages, collects responses, escalates issues to others, and logs all activities for reporting and analysis purposes.
- **Spok® Critical Test Results Management:** Automates and streamlines the process of delivering critical test results to the appropriate clinicians to help ensure patient safety. This solution can send messages from the cardiology, laboratory and radiology departments by means of encrypted smartphone communications, two-way paging, secure email, secure text, images, annotations, and voice to a variety of endpoints such as workstations, laptops, tablets, smartphones, pagers, and other wireless devices.

Mobile Communications

- **Spok Mobile®:** Simplifies communications and strengthens care by using smartphones and tablets for secure code alerts, patient updates, results, consult requests, and much more. Allows users to access the full directory of accurate contact information to send messages/photos/videos to smartphones and other devices, and to ensure clinical communications are logged, all with security, traceability, and reliability.
- **Spok® Device Preference Engine:** Facilitates voice conversations among doctors and caregivers by enabling users to choose the desired communication method based on factors such as message priority.

Public Safety

- **Spok® pc/psap:** Speeds emergency dispatch by giving Public Safety Answering Point call-takers an easy-to-use, standards-based, graphical interface that integrates the underlying phone system, mapping systems, and other resources for critical information availability. 9-1-1 call-takers are able to instantly involve police, fire, EMT, and hazardous material personnel with a single click of the mouse or touch of the screen.
- **Spok® Enterprise Alert:** Directs emergency personnel to a 9-1-1 caller’s exact location (building, floor, room), helping to ensure speed, accuracy, and reliability of response. The E9-1-1 software provides real-time, onsite notification when 9-1-1 is dialed, and works to decrease emergency response time.

We plan to continue investing in our development of Spok Go, however, we believe costs will continue to normalize through 2020. We expect growth in development costs related to Spok Go will continue to decline relative to growth rates we have seen over the past several years. As revenues from Spok Go begin to materialize over the next several years we anticipate improvement in our development costs relative to total software revenues.

Services. We offer a variety of professional services to assist our customers in the successful implementation of, and to maximize the benefits obtained from the use of, our software solutions. We also offer support services to enhance and refine the customer's experience throughout their relationship with Spok.

- **Professional Services:** We offer a full suite of professional services which are provided by a dedicated group of professional service employees. Our professional services include consultation, implementation, and training services. For on-premise software solution implementations, our professional services staff uses a branded, consistent methodology that provides a comprehensive phased work plan for both new software installations and/or upgrades. In support of our implementation methodology, we manage the various aspects of the process through a professional services automation tool. We may also use third-party professional services firms as supplemental resources to implement our solutions for customers as needed. Professional services revenue represented 12% of total consolidated revenue for the year ended December 31, 2019, 11% for the year ended December 31, 2018 and 10% for the year ended December 31, 2017.
- **Software License Updates and Product Support (Maintenance):** Software license updates and product support, which is generally referred to as maintenance when sold to customers, is an important offering to customers who utilize our on-premise software solutions. In order to support our products that provide clinical communication and collaboration solutions to our customer’s organizations, we have a dedicated customer support organization. The customer support organization provides support 24 hours a day, 7 days a week, 365 days a year and the service can be accessed via telephone, email or the Internet via the Spok webpage. The Spok support service is augmented by third party services where needed. Software license updates and product support are generally priced together as a percentage of the software licenses for which these services will be provided. Largely all of our customers purchase maintenance when they purchase new software licenses after which renewals generally occur on an annual basis and are paid in advance. Software license updates provide customers with rights to unspecified product upgrades as well as maintenance and patch releases that are released during the term of the support period. Software license updates and product support revenue (i.e. Maintenance revenue) represented 25% of total consolidated revenue for the year ended December 31, 2019 and, 23% for both the years ended December 31, 2018 and 2017.

Future sales of Spok Go are expected to generate less implementation revenue relative to legacy CCS solution sales. We anticipate that the initial implementation time for a new installation of Spok Go will be significantly less as compared to our on-premise legacy CCS solutions. Additionally, what has historically been referred to as license and maintenance revenues for our on-premise CCS solutions will be bundled together within the SaaS revenue stream, specifically Spok Go. The SaaS revenue stream is inclusive of hosting, access to the Company's software platform and update and support services. Similar to historical maintenance practices, a customer's subscription to Spok Go is renewed on a recurring basis according to the service terms and is generally expected to be from one to five years.

Sources of Equipment

We do not manufacture the messaging devices our customers need to make use of our wireless services or the network equipment we use to provide wireless messaging services. We have relationships with several vendors to purchase new messaging devices. Used messaging devices are available in the secondary market from various sources. We believe existing inventory, returns of devices from customers that canceled wireless services, and purchases from other available sources of new and reconditioned devices will be sufficient to meet expected messaging device requirements for the foreseeable future. We negotiate contractual terms with our vendors that do not directly relate to the manufacturing of the network equipment or messaging devices. The network equipment and messaging devices on which we may place our logo or label are generic.

We sell third party equipment for use with our software solutions. The third-party equipment that we sell is generally available and does not require any specialty manufacturing to accommodate our software solutions.

We currently have inventory and network equipment on hand that we believe will be sufficient to meet our wireless and software equipment requirements for the foreseeable future.

Intellectual Property

As of December 31, 2019, we held 85 trademarks and 12 patents, as well as pending trademarks, which we believe are important to protect our intellectual property. We believe our intellectual property distinguishes our business from our competition and are integral to our continued success in the area of clinical communication and collaboration solutions. The expiration dates of these trademarks range from 2020 to 2032 and can be extended for 10 year periods upon renewals.

Customers

Our customers include businesses and employees who need to be accessible to their offices or customers, first responders who need to be accessible in emergencies, and third parties, such as other telecommunication carriers and resellers that pay our Company to use our networks. Customers include businesses, professionals, management personnel, medical personnel, field sales personnel and service forces, members of the construction industry and construction trades, real estate brokers and developers, sales and services organizations, specialty trade organizations, manufacturing organizations and government agencies.

Our wide ranging customer base allows for low customer revenue concentration and as a result, no single customer accounted for more than 10% of our total revenues in 2019, 2018 or 2017.

We pursue close, long-term relationships with our customers because we believe strong customer relationships enable us to retain our current customer base and expand our services and revenue to that customer base.

Backlog

Our software backlog of undelivered or in-progress orders was $50.6 million and $40.4 million at December 31, 2019 and 2018, respectively. Of the current backlog, we expect to deliver and complete all but $14.1 million in 2020.

Competition

The competitors and degree of competition vary among our various product categories. Competition is particularly strong for our wireless messaging services. Within the wireless industry, companies compete on the basis of price, coverage area, services offered, transmission quality, network reliability and customer service. We compete by maintaining competitive pricing for our products and services, by providing broad coverage options through high-quality, reliable messaging networks and by providing quality customer service. Direct competitors for wireless messaging services include American Messaging Service, LLC and a variety of other regional and local providers. We also compete with a broad array of wireless messaging services provided by mobile telephone companies, including AT&T Mobility LLC, Sprint Nextel Corporation, T-Mobile USA, Inc., and Verizon Wireless, Inc. This competition has intensified as prices for the services of mobile telephone companies have declined and as those companies have incorporated messaging capabilities into their mobile phone devices. Many of these companies possess far greater financial, technical and other resources than we do.

Most personal communications service and other mobile phone devices currently sold in the United States are capable of sending and receiving one-way and two-way messages. Most subscribers that purchase these services no longer need to subscribe to a separate messaging service. As a result, many one-way and two-way messaging subscribers can readily switch to cellular, personal communications service and other mobile telephone services. The decrease in prices and increase in capacity and functionality for cellular, personal communications service, WiFi, and other mobile telephone services have led many subscribers to select combined voice and messaging services from mobile telephone companies as an alternative to our stand-alone messaging services.

We also have a number of competitors whose software products compete with one or more modules of our clinical communication and collaboration solutions. These competitors are a mix of privately held and public companies that offer a number of call center, alerting and mobile communication products. Our primary competitive advantages include having:

- An integrated product suite;
- A communication-driven workflow;
- Certifications, such as those through the Joint Interoperability Test Command (see "Joint Interoperability Test Command" below) and the FDA; and
- A complete directory of contacts throughout the customer enterprise.

Although there are no competitors that offer a similar comprehensive set of software modules that match our product offerings, there are several competitors who offer software similar to many of our solutions. As we continue our transition to a software company the Company's competitive landscape will continue to evolve. Selected competitors for portions of our product portfolio include:

- Alaska Communications Systems Group, Inc. - Mobile communications solutions;
- Appfolio, Inc. - Cloud-based software solutions;
- Boingo Wireless, Inc. - Mobile communications solutions;
- Castlight Health, Inc. - Software as a service health benefits platform;
- Computer Programs and Systems, Inc. - Healthcare IT solutions;
- Everbridge, Inc. - Clinical alerting solutions;
- Evolent Health, Inc. - Healthcare delivery and payment solutions;
- Five9, Inc. - Cloud-based solutions;
- Globalstar, Inc. - Mobile communications solutions;
- HealthStream, Inc. - healthcare development solutions;
- LivePerson,Inc. - Mobile and online messaging solutions;
- MobileIron, Inc. - Mobile communications solutions;
- Model N, Inc. - Revenue management cloud solutions;
- NextGen Healthcare, Inc. - Medical and Dental software, services, and analytic solutions;
- ORBCOMM Inc. - Network connectivity and device management solutions; and
- Vocera Communications, Inc. - Mobile communications solutions.

In addition, substantially larger companies in the electronic medical records space such as Epic Systems Corporation, Cerner Corporation, Athenahealth, Inc. and Allscripts Healthcare Solutions, Inc. may choose to offer software related solutions similar to our clinical communication and collaboration solutions or may acquire one of our competitors.

Research and Development

We maintain a product development group, a substantial portion of which is focused on developing new software products, especially with respect to developing the Spok Go platform and additional enhancements. Within our research and development group is a separate task force focused on ongoing maintenance and enhancement of existing point-solution products. Our product development group uses a methodology that balances enhancement requests from a number of sources including customers, regulatory requirements, the professional services staff, customer support incidents, known defects, market and technology trends, and competitive requirements. These requests are reviewed and prioritized based on criteria that include the potential for increased revenue, customer/employee satisfaction, possible cost savings, and development time and expense.

Employees

At December 31, 2019 and 2018 we had 638 and 596 full time equivalent (“FTE”) employees, respectively. Our employees are not represented by labor unions or covered by a collective bargaining agreement.

Regulation

Federal Regulation

The FCC issues licenses to use radio frequencies necessary to conduct our business and regulate many aspects of the operations that support our wireless revenue. Licenses granted to us by the FCC have varying terms, generally of up to ten years, at which time the FCC must approve renewal applications. In the past, FCC renewal applications generally have been granted upon showing compliance with FCC regulations and adequate service to the public. Other than those still pending, the FCC has thus far granted each license renewal that we have requested.

The Communications Act of 1934, as amended (the “Communications Act”), requires radio licensees, including us, to obtain prior approval from the FCC for the assignment or transfer of control of any construction permit or station license or authorization of any rights thereunder. The FCC has thus far granted each assignment or transfer request we have made in connection with a change of control.

The Communications Act also places limitations on foreign ownership of CMRS licenses, which constitute the majority of our licenses. These foreign ownership restrictions limit the percentage of stockholders’ equity that may be owned or voted, directly or indirectly, by non-United States citizens or their representatives, foreign governments or their representatives, or foreign corporations. Our Amended and Restated Certificate of Incorporation permits the redemption of our equity from stockholders where necessary to ensure compliance with these requirements.

The FCC's rules and regulations require us to pay a variety of fees that otherwise increase our costs of doing business. For example, the FCC requires licensees, including Spok, to pay levies and fees, such as universal service fees, to cover the costs of certain regulatory programs and to promote various other societal goals. These requirements increase the cost of the services provided. By law, we are permitted to bill our customers for these regulatory costs and we typically do so.

Additionally, the Communications Assistance to Law Enforcement Act of 1994, ("CALEA") and certain rules implementing CALEA require some telecommunication companies, including Spok, to design and/or modify their equipment in order to allow law enforcement personnel to "wiretap" or otherwise intercept messages. Other regulatory requirements restrict how we may use customer information and prohibit certain commercial electronic messages, even to our own customers.

In addition, the FCC's rules require us to pay other carriers for the transport and termination of some telecommunication traffic. As a result of various FCC decisions over the last few years, we no longer pay fees for the termination of traffic originating on the networks of local exchange carriers providing wireline services interconnected with our services. In some instances, we received refunds for prior payments to certain local exchange carriers. We have entered into a number of interconnection agreements with local exchange carriers in order to resolve various issues regarding charges imposed by local exchange carriers for interconnection.

Failure to follow the FCC's rules and regulations can result in a variety of penalties, ranging from monetary fines to the loss of licenses. Additionally, the FCC has the authority to modify licenses, or impose additional requirements through changes to its rules.

The FDA has determined software systems that connect to medical devices are subject to regulation as medical devices as defined by the federal Food, Drug and Cosmetic Act ("the FDC Act"). Since our middleware software products connect to medical devices, we are required to comply with the FDC Act's requirements, including but not limited to: registration and listing, labeling, medical device reporting (reporting of medical device-related adverse events), removal and correction, and good manufacturing practice requirements. We have complied with the regulatory requirements of the FDC Act, and registered and received the necessary clearances for our products. As we modify and/or enhance our software products (including our middleware product), we may be required to request FDA clearance before we are permitted to market these products.

In addition, our software solutions may handle or have access to personal health information subject in the United States to the HIPAA, the Health Information Technology for Economic and Clinical Health Act ("HITECH"), and related regulations. These statutes and related regulations impose numerous requirements regarding the use and disclosure of personal health information with which we help our customers comply. Our failure to accurately anticipate or interpret these complex and technical laws could subject us to civil and/or criminal liability. We believe that we are in compliance with these laws and their related regulations.

Although these and other regulatory requirements have not, to date, had a material adverse effect on our operating results, such requirements could have a material impact on our operating results in the future. We monitor discussions at the FCC and FDA on pending changes in regulatory policy or regulations; however, we are unable to predict what changes, if any, may occur in 2020 to regulatory policy or regulations.

State Regulation

As a result of the enactment by the United States Congress of the Omnibus Budget Reconciliation Act of 1993 ("OBRA") in August 1993, states are now generally preempted from exercising rate or entry regulation over any of our operations. States are not preempted, however, from regulating "other terms and conditions" of our operations, including consumer protection and similar rules of general applicability. Zoning requirements are also generally permissible, however, provisions of the OBRA prohibit local zoning authorities from unreasonably restricting wireless services. States that regulate our services also may require us to obtain prior approval of (1) the acquisition of controlling interests in other paging companies and (2) a change of control.

At this time, we are not aware of any proposed state legislation or regulations that would have a material adverse impact on our business.

Joint Interoperability Test Command ("JITC") Certification

JITC is a military organization that tests technology for use by the branches of the armed services of the United States and the United States federal government. JITC certification is required of all systems with joint interfaces or joint information exchanges with other systems used by these organizations and is done to ensure all systems operate effectively together. All information technology and national security systems that exchange and use information to enable units or forces to operate effectively in joint, combined, coalition and interagency operations and simulations must be certified. Once a system has been certified under this program, the certification must be renewed every four years or after any changes that may affect interoperability. The interoperability certification process consists of four basic steps, which are:

- Identify (interoperability) requirements;
- Develop certification approach (planning);
- Perform interoperability test and evaluation; and
- Report certifications and statuses.

We submit and receive JITC certification for certain of our products through the Defense Information Systems Agency, which allows us to sell and implement our solutions at federal government agencies. We currently certify a console, web, speech, mass notification, public safety answering point, call recording and campus 911 product with JITC. We have a roadmap to renew the existing certifications with new releases of existing products and to bring additional products to JITC to increase the products that can be sold into Federal agencies.

Available Information

We make available on our website at http://www.spok.com, free of charge, our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and all amendments to those reports as soon as reasonably practicable after such reports are electronically filed with, or furnished to, the SEC. The SEC also maintains an Internet site that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC at http://www.sec.gov. We also make available on our website, and in print, if any stockholder or other person so requests, our code of business conduct and ethics entitled “Code of Ethics” which is applicable to all employees and directors, our “Corporate Governance Guidelines” and the charters for all committees of our Board of Directors, including Audit, Compensation and Nominating and Governance. Any changes to our Code of Ethics or waiver, if any, of our Code of Ethics for executive officers or directors will be posted on that website.

ITEM 1A. *RISK FACTORS*

The following important factors, among others, could cause our actual operating results to differ materially from those indicated or suggested by forward-looking statements made in this 2019 Form 10-K or presented elsewhere by management from time to time.

Our estimates of market opportunity for our software solutions are subject to significant uncertainty and, even if the markets in which we compete meet or exceed our size estimates, we could fail to increase our revenue or market share.

Market opportunity estimates are based on assumptions and estimates, and our internal analysis and industry experience. However, assessing the market for clinical communication and collaboration solutions, particularly cloud-based, SaaS solutions, is difficult due to several factors, such as limited available information and rapid evolution of the market. Our estimates of market opportunity depend on the assumptions we made, and the estimated market opportunity could be materially different with different assumptions. Even if the markets in which we compete meet or exceed our size estimates, our software solutions may fail to gain market acceptance and our business may not grow in line with our forecasts,

In addition, an increase in the prevalence of cloud-based offerings by us and our competitors could also unfavorably impact the pricing of our on-premise offerings and have a dampening impact on overall demand for our on-premise offerings, which could have a material adverse impact on our business, financial condition and operating results.

The rate of wireless subscriber and revenue erosion could exceed our ability to reduce wireless operating expenses in order to maintain overall positive operating cash flow.

Our wireless revenue is dependent on the number of subscribers that use our paging devices. Our customers may not renew their subscriptions after the expiration of their subscription agreements. In addition, our customers may opt for a lower-priced edition of our offerings or for fewer subscriptions. Our customers’ renewal rates may decline or fluctuate as a result of a number of factors, including their level of satisfaction with our offerings and their ability to continue their operations and spending levels. Increasing awareness and concern over HIPAA/HITECH compliance is causing healthcare organizations, our largest customer segment, to re-evaluate paging subscriptions for clinical use cases when users are not equipped with our encrypted pager offerings.

We face intense competition for subscribers from other paging service providers and alternate wireless communications providers such as mobile phone and mobile data service providers. There is a risk that our competitors' products may provide better performance or include additional features when compared to our offerings. Competitive pressures could also affect the prices we may charge or the demand for our offerings, resulting in reduced profit margins and loss of market share. Our efforts to compete effectively may not be sufficient, which may adversely affect our business, financial condition, operating results and cash flows.

In addition to competition, our customer base may be impacted by the introduction of new technologies. As mobile communications technology evolves, competitors that provide wireless broadband data services may lower their prices to customers that approach, meet or undercut our prices for paging services. We are unable to predict how customer perceptions of the value of our wireless services will be impacted by the development of new wireless technologies. Our continued success will depend on our ability to adapt to rapidly changing technologies and user preferences, to adapt our offerings to evolving industry standards, to predict user preferences and industry changes in order to continue to provide value to our customers and to improve the performance and reliability of our offerings. Our failure to adapt to such changes could harm our business, and our efforts to adapt to such changes could require substantial expenditures on our part to modify our offerings or infrastructure. Delays in developing, completing or delivering new or enhanced offerings and technologies could result in delayed or reduced revenue for those offerings and could also adversely affect customer acceptance of those offerings and technologies. Even if we are able to enhance our existing offerings or introduce new offerings that are well perceived by the market, if our marketing or sales efforts do not generate interest in or sales for these offerings, they may be unsuccessful.

We expect our wireless subscriber results, units in service and revenue will continue to decline for the foreseeable future. As this revenue erosion continues, maintaining positive cash flow is dependent on substantial and timely reductions in selected wireless operating expenses. Reductions in wireless operating expenses require both the reduction of internal costs and negotiation of lower costs from outside vendors. As we require fewer services and products from our vendors, our negotiating leverage to lower our costs is diminished. There can be no assurance that we will be able to reduce our wireless operating expenses commensurate with the level of revenue erosion. The inability to reduce wireless operating expenses would have a material adverse impact on our business, financial condition and operating results including our continued ability to remain profitable, produce positive operating cash flow, continue our research and development investment in Spok Go, pay cash dividends to stockholders, and repurchase shares of our common stock.

If we are unable to enhance and deploy our cloud-based offerings while continuing to effectively support our on-premise offerings, our business and operating results could be adversely affected.

Historically, our revenue has been driven predominately by our on-premise offerings. However, we have responded to the increasing market shift toward cloud-based offerings by developing cloud-based solutions that we expect to offer to our customers in the upcoming year. Despite the launch of our cloud-based offerings, we expect our customers to continue to require substantial on-premise offerings through a transition period while gradually adopting our cloud-based offerings. To support deployment of both our on-premise and cloud-based offerings, our developers and support team must learn multiple environments in which our platform is deployed, which is more expensive than training such individuals on a single environment. Furthermore, we cannot ensure that the market for cloud-based offerings will develop at a rate or in the manner we expect, or that our cloud-based offerings will be competitive with those of more established cloud-based providers or other new market entrants. Customers may require features and capabilities that our current solutions do not have and that we may be unable to develop. If we are unable to develop and deploy cloud-based offerings alongside on-premise offerings that satisfy customer preferences in a timely and cost-effective manner, it may harm our ability to retain existing customers and to attract new customers, which could have a material adverse impact on our business, financial condition and operating results.

Our transition to a SaaS based business model may negatively impact our revenue, and if we fail to successfully manage the transition, our business, financial condition and operating results may be adversely affected.

We are currently transitioning to a SaaS based business model and may undergo additional business model changes in the future in order to adapt to changing market demands. Such business model changes entail significant known and unknown risks and uncertainties, and we cannot provide assurance that we will be able to complete the transition or manage the transition successfully and in a timely manner. If we do not successfully complete the transition, or fail to do so in a timely manner, our revenues, business and operating results may be adversely affected. The transition to a SaaS business model also means that our historical results, especially those achieved before we began the transition, may not be indicative of our future results.

Regardless of how we manage the transition, our total billings and revenue may be adversely impacted by the transition, particularly when compared to historical periods. If we are unable to increase the volume of our SaaS sales in any given period to make up for the lower selling price of certain subscription-based offerings compared to the selling price of on-premise offerings, our total billings and revenue for such period will be negatively impacted. Additionally, the revenue associated with certain SaaS subscription purchases will be recognized ratably over the term of the subscription, resulting in less upfront revenue as compared to our perpetual and term-based licenses. This may result in increased volatility in our reported revenues and operating results if demand for our subscription-based offerings increases in the future. These factors may also make it difficult to increase our revenue in a given period even with additional sales in the same period. In addition, maintaining our historically high customer renewal rates will become increasingly important. Our SaaS customers have no obligation to renew their subscriptions for our solutions after the expiration of the subscription term, and may decide not to renew, renew only for a portion of our solutions, or renew with pricing terms that are less favorable to us. Customer renewal rates may decline or fluctuate due to a number of factors, including their level of satisfaction with our solutions, their ability to continue their operations and spending levels, the pricing of our solutions and the availability of competing solutions. If our renewal rates decline, our total billings and revenue will fluctuate or decline, and our business and financial results will be negatively affected.

Additional risks associated with our transition to a SaaS business model include, but are not limited to:

- If current or prospective end customers prefer our on-premise licenses, adoption of our subscription-based model may not meet our expectations, or may take longer than anticipated to achieve;
- Potential confusion or concerns among current or prospective end customers and channel partners, including concerns regarding changes to our pricing models;
- We may be unsuccessful in implementing or maintaining subscription-based pricing models, which could negatively affect adoption, renewal rates and our business results;
- If we are unsuccessful in implementing our go-to-market cost structure in a timely or cost-effective manner, we may incur sales compensation costs at a higher than forecasted rate, particularly if the pace of our subscription transition is faster than anticipated;
- Investors, industry and financial analysts may have difficulty understanding the shift in our business model, resulting in changes in financial estimates or perceived failure to meet investor expectations.

Finally, as we transition to a SaaS business model, there are many risks or uncertainties that may remain unknown to us until we have gathered more information as part of the transition. If we fail to anticipate these unknowns, whether due to a lack of information, precedent, or otherwise, or if we fail to properly manage expected risks and/or execute our transition to a subscription-based business model, our business and operating results, and our ability to accurately forecast our future operating results, may be adversely affected.

We may be unable to effectively develop, introduce and deploy our integrated communications platform and collaboration platform, Spok Go, which is the basis for our future growth.

Our future revenue growth depends on our ability to develop, introduce and effectively deploy our Spok Go platform. This multi-year effort will require the coordination of multiple development teams dedicated to this task. Simultaneously with this new development effort, we must continue to improve and support our existing suite of products to transition them to Spok Go. We foresee the following risks inherent in this process:

- Requirements Definition - Our plans for Spok Go may not meet the market's needs or customer expectations and could result in low market demand and/or acceptance.
- Product Scope and Schedule - Our product scope may be subject to development from market-led requirements, new technologies or competitors expanding product capabilities or entering into adjacent markets. We may fail to manage the scope of our software development activities effectively, resulting in delays in meeting key milestones, achieving network solutions on a fully integrated basis, or solving coding problems in a timely and efficient manner. In addition, the continuing software development efforts on our existing products could distract management time and focus from developing Spok Go.
- Staffing and Organization - The development of Spok Go requires the hiring of new personnel. We may be unable to attract, in a timely manner, the qualified staff to meet our requirements. In addition the organizational changes and new hires necessary to address our development requirements could create attrition risk for our current staff.
- Operational Readiness - Even if the development of Spok Go occurs as we have planned, we may not be prepared or ready to sell, deliver and support the new platform technology.

Technical problems and higher costs may affect our product development initiatives.

Our future software revenue growth depends on our ability to develop, introduce and effectively deploy new solutions and features to our existing software solutions. These new features and functionalities are designed to address both existing and new customer requirements. We may experience technical problems and additional costs as these new features are tested and deployed. Failure to effectively develop new or improved software solutions could adversely impact software revenue growth and could have a material adverse effect on our operations, financial condition and statement of operations including our continued ability to remain profitable, produce positive operating cash flow, pay cash dividends to stockholders, and repurchase shares of our common stock.

We are dependent on the U.S. healthcare provider market segment for most of our revenue.

Over 75% of our revenue for wireless services and software products comes from sales to hospitals and other healthcare provider organizations in the United States. These customers, both non-profit and for-profit, are greatly affected by healthcare reform and the reimbursement policies of the federal and state governments and health insurance companies, and any decline in revenue received by our customers due to adverse economic conditions or legislative or regulatory changes could significantly affect the type and amount of services and products they order from us. We do not anticipate any flexibility in increasing prices for our wireless services notwithstanding general inflation due to an unrelenting focus by our customers on their cost structures, and our customers could be slow to invest in our software products and professional services due to budgetary pressures.

If we are unable to retain key management personnel, we might not be able to find suitable replacements in a timely manner, or at all, and our business could be disrupted.

Our success is largely dependent upon the continued service, availability and performance of key personnel, including our Chief Executive Officer, senior management team and other highly skilled personnel, particularly in product development, product strategy and sales. We believe that there is, and will continue to be, intense competition for qualified personnel in the telecommunication and software industries, and there is no assurance that we will be able to attract, motivate and retain the personnel necessary for the management and development of our business. Turnover, particularly among senior management, can also create distractions as we search for replacement personnel, which could result in significant recruiting, relocation, training and other costs, and could cause operational inefficiencies as replacement personnel become familiar with our business and operations. In addition, manpower in certain areas may be constrained, which could lead to disruptions over time. The elimination or reconfiguration of employee responsibilities could impact retention decisions by key executives and personnel. Also, to the extent we hire personnel from competitors, we may be subject to allegations that they have been improperly solicited, that they have divulged proprietary or other confidential information, or that their former employers own their inventions or other work product. Moreover, the loss of these key employees, particularly to a competitor, some of which may be in a position to offer greater compensation, and any resulting loss of customers could reduce our market share and diminish our brands.

We depend on highly skilled personnel and, if we are unable to retain or hire additional qualified personnel, we may not be able to achieve our strategic objectives.

To execute our growth plan and achieve our strategic objectives, we must continue to attract and retain highly qualified and motivated personnel across our organization. In particular, to continue to enhance our software solutions, add new and innovative core functionality and services, as well as develop new products, it will be critical for us to increase the size of our research and product development organization, including hiring highly skilled software engineers. Competition for software engineers is intense within our industry and there continues to be upward pressure on the compensation paid to these professionals. In addition, for us to achieve broader market acceptance of our software solutions, grow our customer base, and pursue adjacent markets, we will need to continue to increase the size of our sales and marketing and customer support organizations. Identifying and recruiting qualified personnel, training them in the use of our software solutions and ensuring they are well-equipped to serve our customers requires a significant investment of time and resources, and it can be particularly difficult to retain these individuals.

Many of the companies with which we compete for experienced personnel have greater name recognition and financial resources than we have. If we hire employees from competitors or other companies, their former employers may attempt to assert that we or these employees have breached their legal obligations to the former employer, resulting in a diversion of our time and resources. In addition, the job market in the Minneapolis-St. Paul area, where the majority of our software developers are located, has historically been very competitive, and existing employees often consider the value of the equity awards they receive in connection with their employment. If the perceived value of our equity awards declines, or if the price of our common stock experiences significant volatility, this may adversely affect our ability to recruit and retain highly skilled employees. As a result, we have greater difficulty hiring and retaining skilled personnel than some of our competitors. If we are unable to attract and retain the personnel necessary to execute our growth plan, we may be unable to achieve our strategic objectives and our business, financial condition and operating results may be adversely affected.

Growth in our software revenue and bookings, and maintenance of our wireless revenue and subscriber base is dependent on the productivity of our sales organization.

Our ability to achieve revenue growth will depend, in large part, on our success in recruiting, training and retaining sufficient numbers of sales personnel to support our growth. New hires require significant training and may take significant time before they achieve full productivity. Based on past experience, we expect new sales team members to reach full productivity after nine months of employment. However, our recent hires and planned hires may not become productive as quickly as we expect, or at all, and we may be unable to hire or retain a sufficient number of qualified individuals in the markets where we do business or plan to do business. Moreover, as we commence our transition to a subscription-based business model, we are also re-training our experienced sales employees, who have historically focused on wireless and on-premise sales.

From time to time it may be necessary to reorient our sales representatives to focus on specific market segments, product lines or new software solutions or to remove underperforming individuals, which may require additional resources to maintain productivity. The impact of these changes could adversely impact our ability to achieve our sales productivity goals. We have also identified the following risks that could impact our sales productivity:

- **Customer Dissatisfaction and Reputational Harm** - We may experience customer dissatisfaction with our solutions that could result in lost opportunities for sales. Potential low ratings of our solutions may result in us being excluded from consideration by current and prospective customers with respect to future opportunities. In addition, fewer customer references for our solutions could impact our ability to prospect new sales.
- **Training** - Training of our marketing and sales personnel as to the clinical requirements of our healthcare customers and the complexity of our service offerings, takes time and requires a substantial, continuing investment in new hires as well as long term employees.
- **Competitive Speed** - Sales productivity can be impacted by the capabilities of our competitors. There is a risk that competitors may innovate, or partner faster than we do to deliver a unified communications platform.
- **Employee Retention** - The impact of the elements noted above may challenge the ability of employees to make sales, which may affect morale and employee retention.

If we are unable to deliver effective customer support, it could harm our relationships with our existing customers and adversely affect our ability to attract new customers.

Our revenue growth depends, in part, on our ability to satisfy our customers, including by providing continued customer support, which may contribute to increased customer retention and adoption and utilization of our wireless services and software solutions. Once our wireless services and software solutions are deployed, our customers depend on our customer support group to resolve technical issues relating to their use of our solutions. We may be unable to respond quickly to accommodate short-term increases in customer demand for support services or may otherwise encounter a customer issue that is difficult to resolve. If a customer is not satisfied with the quality of our customer support, we may need to incur additional costs to remedy the situation or a customer may choose to terminate, or not to renew, their relationship with us.

Our sales process is highly dependent on the ease of use of our wireless services and software solutions, our reputation and positive recommendations from our existing customers. Any failure to maintain high-quality or responsive customer support, or a market perception that we do not maintain high-quality or responsive customer support, could harm our reputation, cause us to lose customers and adversely impact our ability to sell our wireless services and software solutions to prospective customers.

We may experience a long sales cycle for our software products.

Our software revenue growth results from a long sales cycle that from initial contact to final sales order may take six to 18 months, depending on the type of software solution. Our software sales and marketing efforts involve educating our customers on the technical capabilities of our software solutions and the potential benefits from the deployment of our software, as well as educating ourselves as to the clinical needs of our customers. The inherent unpredictability of decision making in our target market segment of healthcare resulting from customer budget constraints, multiple approvals and administrative issues may result in fluctuating bookings and revenue from month to month, quarter to quarter and year to year. Our bookings and corresponding revenue are dependent on actions that have occurred in the past. Each month we need to spend substantial time, effort, and expense on our marketing and sales efforts that may not result in future revenue.

Undetected defects, bugs, or security vulnerabilities in our products could adversely affect the market acceptance of new products, damage our reputation with current or prospective customers, and materially and adversely affect our operating costs.

Software products, such as those we offer, may contain defects and bugs when they are first introduced or as new versions are released, or their release may be delayed due to unforeseen difficulties during product development. If any of our products, including products of companies we have acquired, or third-party components used in our products, contain defects or bugs, or have reliability, quality or compatibility problems, we may not be able to successfully design workarounds. Any defects we do not detect and fix in pre-release testing could cause reduced sales and revenue, damage to our reputation, repair or remediation costs, delays in the release of new products or versions, or legal liability. There can be no assurance that provisions in our license agreements that limit our exposure to liability will be sufficient or withstand legal challenge. Computer programmers and hackers also may be able to develop and deploy viruses, worms, and other malicious software programs that attack our products or otherwise exploit any security vulnerabilities of our products.

Wireless service to our customers could be adversely impacted by network rationalization.

We have an active program to consolidate the number of networks and related transmitter locations, which is referred to as network rationalization. Network rationalization is necessary to match our technical infrastructure to our smaller subscriber base and to reduce both site rent and telecommunication costs. The implementation of the network rationalization program could adversely impact service to our existing subscribers, and there can be no assurance that any efforts to minimize that impact would be successful. This adverse impact could increase the rate of gross subscriber cancellations and/or the level of wireless revenue erosion. Adverse changes in gross subscriber cancellations and/or revenue erosion could have a material adverse effect on our business, financial condition and operating results.

We may be unable to find vendors able to supply us with wireless paging equipment based on future demands.

We purchase paging equipment from third party vendors. This equipment is sold or leased to customers in order to provide wireless messaging services. The reduction in industry demand for paging equipment has caused various suppliers to cease manufacturing this equipment or increase prices for devices. There can be no assurance that we will continue to find vendors to supply paging equipment, or that the vendors will supply equipment at costs that allow us to remain a competitive alternative in the wireless messaging industry. A lack of paging equipment could impact our ability to provide certain wireless messaging services and could have a material adverse effect on our business, leading to further wireless revenue erosion.

We may be unable to maintain successful relationships with our channel partners.

We use channel partners such as resellers, consulting firms, original equipment manufacturers, and technology partners to license and support our products. We rely, to a significant degree, on each of our channel partners to select, screen and maintain relationships with its distribution network and to distribute our offerings in a manner that is consistent with applicable law and regulatory requirements and our quality standards. Contract defaults by any of these channel partners or the loss of our relationships with them may materially adversely affect our ability to develop, market, sell, or support our communication solution offerings. If our indirect distribution channel is disrupted, we may be required to devote more resources to distribute our offerings directly and support our customers, which may not be as effective and could lead to higher costs, reduced revenue and growth that is slower than expected.

Recruiting and retaining qualified channel partners and training them in the use of our enterprise technologies requires significant time and resources. If we fail to devote sufficient resources to support and expand our network of channel partners, our business may be adversely affected. In addition, because we rely on channel partners for the indirect distribution of our enterprise technologies, we may have little or no contact with the ultimate end-users of our technologies, thereby making it more difficult for us to establish brand awareness, ensure proper delivery and installation of our software, support ongoing customer requirements, estimate end-user demand, respond to evolving customer needs and obtain subscription renewals from end-users.

We may be unable to realize the benefits associated with our deferred income tax assets.

We have significant deferred income tax assets that are available to offset future taxable income and increase cash flows from operations. The use of these deferred income tax assets is dependent on the availability of taxable income in future periods. The availability of future taxable income is dependent on our ability to profitably manage our operations to support a growing base of software revenue offset by declining wireless subscribers and revenue. To the extent that anticipated reductions in wireless operating expenses do not occur or sufficient revenue is not generated, we may not achieve sufficient taxable income to allow for use of our deferred income tax assets. The accounting for deferred income tax assets is based upon an estimate of future results, and any valuation allowance we may apply to our deferred tax assets may be increased or decreased as conditions change or if we are unable to implement certain tax planning strategies. If we are unable to use these deferred income tax assets, our financial condition and statement of operations may be materially affected. In addition, a significant portion of our deferred income tax assets relate to net operating losses. If our ability to utilize these losses is limited, due to Internal Revenue Code (“IRC”) Section 382, our financial condition and statement of operations may be materially affected.

Our wireless products are regulated by the FCC and, to a lesser extent, state and local regulatory authorities. Changes in regulation could result in increased costs to us and our customers.

We are subject to regulation by the FCC and, to a lesser extent, by state and local authorities. Changes in regulatory policy could increase the fees we must pay to the government or to third parties, and could subject us to more stringent requirements that could cause us to incur additional capital and/or operating costs. To the extent additional regulatory costs are passed along to customers, those increased costs could adversely impact subscriber cancellations.

For example, the FCC issued an order in October 2007 that mandated paging carriers (including the Company) along with all other CMRS providers serving a defined minimum number of subscribers to maintain an emergency back-up power supply at all cell sites to enable operation for a minimum of eight hours in the event of a loss of commercial power (the “Back-up Power Order”). Ultimately, after a hearing by the DC Circuit Court and disapproval by the Office of Management and Budget (the “OMB”) of the information collection requirements of the Back-Up Power Order, the FCC indicated that it would not seek to override the OMB’s disapproval. Rather the FCC indicated that it would issue a Notice of Proposed Rulemaking with the goal of adopting revised back-up power rules. To date, there has been no Notice of Proposed Rulemaking by the FCC and we are unable to predict what impact, if any, a revised back-up power rule could have on our operations, cash flows, ability to continue payment of cash dividends to stockholders, and ability to repurchase shares of our common stock.

As a further example, the FCC continues to consider changes to the rules governing the collection of universal service fees. The FCC is evaluating a flat monthly charge per assigned telephone number as opposed to assessing universal service contributions based on telecommunication carriers’ interstate revenue. There is no timetable for any rulemaking to implement this numbers-based methodology. If the FCC adopts a numbers-based methodology, our attempt to recover the increased contribution costs from our customers could significantly diminish demand for our services, and our failure to recover such increased contribution costs could have a material adverse impact on our business, financial condition and results of operations.

Certain of our software products are regulated by the FDA. The application of or changes in regulations could impact our ability to market new or revised software products to our customers.

Certain of our software products are regulated by the FDA as medical devices. The classification of our software products as medical devices means that we are required to comply with certain registration and listing, labeling, medical device reporting, removal and correction, and good manufacturing practice requirements. Updates to these products or the development of new products could require us to seek clearance from the FDA before we are permitted to market or sell these software products. In addition, changes to FDA regulations could impact existing software products or require updates to existing products. The impact of delays in FDA clearance or changes to FDA regulations could impact our ability to market or sell our software products and could have a material adverse effect on our software sales, financial condition and results of operations, including our continued ability to remain profitable, produce positive operating cash flow, pay cash dividends to stockholders and repurchase shares of our common stock.

We may experience litigation claiming intellectual property infringement by us, and we may not be able to protect our rights in intellectual property that we own and develop.

Intellectual property infringement litigation has become commonplace, particularly in the wireless and software industries in which we operate. Litigations can be protracted, expensive, and time consuming. There is no assurance that we will remain immune to this litigation. Any such claims, whether meritorious or not, could be time consuming and costly in terms of both resources and management time.

We may receive claims that we have infringed the intellectual property rights of others, including claims regarding patents, copyrights, and trademarks. The number and types of these claims may grow as a result of constant technological change in the segments in which our wireless services and software products compete, the extensive patent coverage of existing technologies, and the rapid rate of issuance of new patents.

Our patents, trademarks, copyrights and trade secrets relating to our wireless services and networks, and our software solutions, are important assets. The efforts we undertake to protect our proprietary rights may not be sufficient or effective. Any significant impairment to our intellectual property rights could harm our business and our ability to compete effectively. Protecting our intellectual property rights can be costly and time consuming.

We seek to maintain certain of our intellectual property rights as trade secrets, including the source code for many of our software solutions and innovations. Our source code and system architecture may be reverse engineered by our competitors, or the secrecy of our solutions and designs could be compromised through a security breach or otherwise, or by our employees or former employees, intentionally or accidentally. Any compromise of our trade secrets could cause us to lose any competitive advantage our software solutions have and the investment we have made in developing our products and services.

Our portfolio of issued patents and copyrights may be insufficient to defend ourselves against intellectual property infringement claims, and the validity and scope of our patents could be challenged by third parties were we to seek to enforce them.

Our use of open source software, third-party software and other intellectual property may expose us to risks.

We license and integrate certain software components from third parties into our software, and we expect to continue to use third party software in the future. Some open source software licenses require users who distribute or make available as a service open source software as part of their own software product to publicly disclose all or part of the source code of the users' developed software or to make available any derivative works of the open source code on unfavorable terms or at no cost. Our efforts to use the open source software in a manner consistent with the relevant license terms that would not require us to disclose our proprietary code or license our proprietary software at no cost may not be successful. We may face claims by third parties seeking to enforce the license terms applicable to such open source software, including by demanding the release of the open source software, derivative works or our proprietary source code that was developed using such software. In addition, if the license terms for the open source code change, we may be forced to re-engineer our software or incur additional costs.

Some of our products and services include other software or intellectual property licensed from third parties, and we also use software and other intellectual property licensed from third parties in our business. This exposes us to risks over which we may have little or no control. For example, a licensor may have difficulties keeping up with technological changes or may stop supporting the software or other intellectual property that it licenses to us. There can be no assurance that the licenses we use will be available on acceptable terms, if at all. In addition, a third party may assert that we or our customers are in breach of the terms of a license, which could, among other things, give such third party the right to terminate a license or seek damages from us, or both. Our inability to obtain or maintain certain licenses or other rights or to obtain or maintain such licenses or rights on favorable terms, or the need to engage in litigation regarding these matters, could result in delays in releases of new products, and could otherwise disrupt our business, until equivalent technology can be identified, licensed or developed. In addition, sophisticated hardware and operating system software and applications that we procure from third parties may contain defects in design or manufacture, including ''bugs,'' security vulnerabilities, and other problems that could unexpectedly interfere with the expected operation of our products and services.

We may encounter issues with privacy and security of personal information.

A substantial portion of our revenue comes from healthcare customers. As part of our business, we (or third parties with whom we contract) may receive, store and process our data, as well as our customers' and partners' private data and personal information. As such, our business is subject to a variety of federal, state and international laws and regulations that apply to the collection, use, retention, protection, disclosure, transfer and processing of personal data.

Our software solutions may handle or have access to personal health information subject in the United States to HIPAA, HITECH and related regulations as well as legislation and regulations in foreign countries. These statutes and related regulations impose numerous requirements regarding the use and disclosure of personal health information with which we and our software solutions must comply. Our failure to accurately anticipate or interpret these complex and technical laws and regulations could subject us to civil and/or criminal liability. Such failure could adversely impact our ability to market and sell our software solutions to healthcare customers, and have a material adverse impact on our software sales. In addition to personal health information, the Company may handle or have access to personal information subject in the European Union to General Data Protection Regulations (GDPR). The GDPR imposes several stringent requirements for controllers and processors of personal data and increases our obligations, including, for example, by requiring more robust disclosures to individuals, strengthening the individual data rights regime, shortening timelines for data breach notifications, limiting retention periods and secondary use of information, and imposing additional obligations when we contract third party processors in connection with the processing of personal data. The GDPR could limit our ability to use and share personal data or could cause our costs to increase and harm our business, financial condition, operating results and cash flows. Failure to comply with the requirements of the GDPR and the applicable European Union member states may result in fines of up to €20,000,000 or up to 4% of the total worldwide annual turnover of the preceding financial year, whichever is higher, and other administrative penalties. To comply with the new data protection rules imposed by the GDPR we may be required to put in place additional mechanisms which could be onerous and adversely affect our business, financial condition, results of operations and prospects. Existing privacy-related laws and regulations in the United States and other countries are evolving and are subject to potentially differing interpretations, and various U.S. federal and state or other international legislative and regulatory bodies may expand or enact laws regarding privacy and data security-related matters. In the U.S., the state of California enacted the California Consumer Privacy Act, which came into effect on January 1, 2020, and which also imposes heightened transparency obligations and requirements to make available data collected about California residents and to provide them the ability to object to the sale, or request deletion of, their personal data in certain instances. If other states in the U.S. adopt similar laws or if a comprehensive federal data privacy law is enacted, we may expend considerable resources to meet these requirements.

In addition, customers may use our wireless services to transmit patient health information subject to HIPAA and other regulatory requirements. While we offer encrypted pagers to our customers, many customers use pager devices provided by us that do not encrypt text messages. While we disclaim liability for customer non-compliance with HIPAA and other privacy requirements, there remains some risk we could be held responsible for privacy violations by our customers.

There can be no assurance that the security and testing measures we take relating to our offerings and operations will prevent all security breaches and data loss that could harm our business or the businesses of our customers and partners. These risks may increase as we continue to grow our services and offerings and as we receive, store and process more of our customers' data. Actual or perceived vulnerabilities may lead to regulatory investigations, claims against us by customers, partners or other third parties, or costs, such as those related to providing customer notifications and fraud monitoring. There can be no assurance that any provisions in our customer agreements limiting our liability will be enforceable or effective under applicable law. In addition, the cost and operational consequences of implementing further data protection measures could be significant.

The data privacy and protection-related laws and regulations to which we are subject are evolving, with new or modified laws and regulations proposed and implemented frequently, and existing laws and regulations subject to new or different interpretations. Any failure by us to comply with data privacy- and protection-related laws and regulations could result in enforcement actions, significant penalties or other legal actions against us or our customers or suppliers. An actual or alleged failure to comply, which could result in negative publicity, reduce demand for our offerings, increase the cost of compliance, require changes in business practices that result in reduced revenue, restrict our ability to provide our offerings in certain locations, result in our customers' inability to use our offerings and prohibit data transfers or result in other claims, liabilities or sanctions, including fines, and could have an adverse effect on our business, financial condition, operating results and cash flows.

System disruptions and security threats to our computer networks, satellite control or telecommunications systems could have a material adverse effect on our business.

The performance and reliability of our computer network and telecommunications systems infrastructure, as well as the technology infrastructure of third parties, is critical to our operations. This technology infrastructure may be vulnerable to damage or interruption from natural disasters, power loss, telecommunication failures, terrorist attacks, software errors and other events. Any computer system or satellite network error or failure, regardless of cause, could result in a substantial outage that materially disrupts our operations. In addition, we face the threat to our computer systems of unauthorized access, computer hackers, computer viruses, malicious code, organized cyber-attacks and other security problems and system disruptions. Our satellite network connections for our wireless services depend upon very small aperture terminals, many of which are based on decades-old technology or equipment that could fail and result in a loss of service to our customers. With respect to our Enterprise Reporting and Management systems and data storage, we rely on third party data centers and services for maintaining accessibility, reliability and uninterrupted connectivity.

A significant number of the systems making up this infrastructure are not redundant, and our disaster recovery planning may not be sufficient for every eventuality. We may not carry business interruption insurance sufficient to protect us from all losses that may result from interruptions in our services as a result of technology infrastructure failures or to cover all contingencies. We may be required to expend significant resources to protect against the threat of these system disruptions or to alleviate problems caused by these disruptions. Any interruption in the availability of our websites and on-line interactions with customers or partners may cause a reduction in customer or partner satisfaction levels, which in turn could cause additional claims, reduced revenue or loss of customers or partners. There can be no assurance that any precautions we take will prove successful, and such problems could result in, among other consequences, a loss of data, loss of confidence in the stability and reliability of our offerings, damage to our reputation, and legal liability, all of which may adversely affect our business, financial condition, operating results and cash flows.

Unauthorized breaches or failures in cybersecurity measures adopted by us and/or included in our products and services could have a material adverse effect on our business.

Our security systems are designed to maintain the physical security of our facilities and protect our customers', suppliers' and employees' confidential information, as well as our own proprietary information. However, we are also dependent on a number of third-party providers of critical corporate infrastructure services relating to, among other things, human resources, electronic communication services and certain finance functions, and we are, of necessity, dependent on the security systems of these providers. Accidental or willful security breaches or other unauthorized access by third parties or our employees or contractors to our facilities, our information systems or the systems of our third party providers, or the existence of computer viruses or malware in our or their data or software could expose us to risks of information loss and misappropriation of proprietary and confidential information, including information relating to our products or customers and the personal information of our employees. We utilize a costly, multilayered security framework including detailed security policies and procedures, security appliances and software, third party vulnerability testing and detailed business continuity plans that could be disrupted at any time.

In addition, we have, from time to time, also been subject to unauthorized network intrusions and malware on our own IT networks. Any theft or misuse of confidential, personal or proprietary information as a result of such activities could result in, among other things, unfavorable publicity, damage to our reputation, loss of our trade secrets and other competitive information, difficulty in marketing our products, allegations by our customers that we have not performed our contractual obligations, litigation by affected parties and possible financial obligations for liabilities and damages related to the theft or misuse of such information, as well as fines and other sanctions resulting from any related breaches of data privacy regulations, any of which could have a material adverse effect on our reputation, business, profitability and financial condition. Furthermore, the techniques used to obtain unauthorized access or to sabotage systems change frequently and are often not recognized until launched against a target, and we may be unable to anticipate these techniques or to implement adequate preventative measures.

General economic conditions that are largely out of our control may adversely affect our financial condition and statement of operations.

Our business is sensitive to changes in general economic conditions, both in the United States and foreign markets. Recessionary economic cycles, higher interest rates, inflation, higher levels of unemployment, higher tax rates and other changes in tax laws, or other economic factors that may affect business spending or buying habits could adversely affect the demand for our services. This adverse impact could increase the rate of gross subscriber cancellations and/or the level of revenue erosion.

A significant portion of our revenue is derived from healthcare customers and we are impacted by changes in the healthcare economic environment. The healthcare industry is highly regulated and is subject to changing political, legislative, regulatory, and other economic developments. These developments can have a dramatic effect on the decision-making and spending by our customers for information technology and software. This economic uncertainty can add to the unpredictability of decision-making and lengthen our sales cycle.

Further, the consequences of the implementation of changes to healthcare reform legislation continue to impact both the economy in general and the healthcare market in particular. The uncertainty created by the possibility of changes to the legislation is impacting customer decision making and information technology plans in our key healthcare market. We are unable to predict the full consequences of this uncertainty on our operations. Adverse changes in the economic environment could adversely impact our ability to market and sell our wireless and software solutions to healthcare customers.

If our long-lived assets, intangible assets subject to amortization or goodwill become impaired, we may be required to record a significant charge to earnings.

We are required to evaluate the carrying value of our long-lived assets, amortizable intangible assets and goodwill. For long-lived and amortizable intangible assets, we assess quarterly whether circumstances exist which suggest that the carrying value of long-lived and amortizable intangible assets may not be recoverable. We evaluate goodwill for impairment at least annually, or when events or circumstances suggest a potential impairment has occurred. We generally perform this annual goodwill impairment test in the fourth quarter of the fiscal year.

If our long-lived assets, intangible assets subject to amortization or goodwill are deemed to be impaired, an impairment loss equal to the amount by which the carrying amount exceeds the fair value of the assets would be recognized. We may be required to record a significant charge in our financial statements during the period in which any impairment of our long-lived assets, intangible assets subject to amortization or goodwill is determined, which would negatively affect our results of operations. For example, in the fourth quarter of 2019 we recognized non-cash pre-tax goodwill impairment charges of $8.8 million.

We have investigated potential acquisitions and may not be able to identify an opportunity at favorable terms or have the ability to close on the financing necessary to consummate the transaction.

We cannot provide any assurances that we will be successful in finding such acquisitions or consummating future acquisitions on favorable terms. We anticipate that our acquisitions will be financed through a combination of methods, including but not limited to the use of available cash on hand, and, if necessary, borrowings from third party financial institutions. Disruptions in credit markets and an unwillingness to lend may limit our ability to finance acquisitions.

We have investigated potential acquisitions and may be unable to successfully integrate such acquisitions into our business and may not achieve all or any of the operating synergies or anticipated benefits of those acquisitions.

We continue to evaluate acquisitions of other businesses where we believe such acquisitions will yield increased cash flows, improved market penetration and/or identified operating efficiencies and synergies. We may face various challenges with our integration efforts, including the combination and simplification of product and service offerings, sales and marketing approaches and establishment of combined operations.

We may have limited or no history of owning and operating any business that we acquire. If we were to acquire these businesses, there can be no assurance that:

- such businesses will perform as expected;
- such businesses will not incur unforeseen obligations or liabilities;
- such businesses will generate sufficient cash flow to support the indebtedness, if incurred, to acquire them or the expenditures needed to develop them; and/or
- the rate of return from such businesses will justify the decision to invest the capital to acquire them.

There can be no assurance that we will manage these challenges and risks successfully. Moreover, if we are not successful in completing transactions that we have pursued or may pursue, our business may be adversely affected, and we may incur substantial expenses and divert significant management time and resources. In addition, in pursuing and completing such transactions, we could use substantial portions of our available cash to pay for all or a portion of the purchase price for these transactions or retention incentives to employees of the acquired business, or we may incur substantial debt. We could also issue additional securities to finance all or a portion of the purchase price for these transactions or as retention incentives to employees of the acquired business, which could cause our stockholders to suffer significant dilution. Any of such transactions may not generate additional revenue or profit for us, or may take longer to do so than expected, which may adversely affect our business, financial condition, operating results and cash flows.

ITEM 1B. *UNRESOLVED STAFF COMMENTS*

We had no unresolved SEC staff comments as of February 27, 2020.

ITEM 2. *PROPERTIES*

Our corporate headquarters is located in Springfield, Virginia, and consists of approximately 18,000 square feet of space under a lease that expires on March 31, 2021. At December 31, 2019, we leased facility space, including our executive headquarters, sales offices, technical facilities, warehouse and storage facilities in 60 locations in 28 states in the United States, one facility in Australia and one facility in the Middle East. The total leased space is approximately 165,000 square feet. At December 31, 2019, we owned four small parcels of land in three states in the United States.

At December 31, 2019, we leased transmitter sites on commercial broadcast towers, buildings and other fixed structures, some of which are free of charge, in approximately 3,078 locations throughout the United States. These leases are for our active transmitters and are for various terms and provide for periodic lease payments at various rates.

At December 31, 2019, we had 3,840 active transmitters on leased sites which provide service to our customers.

ITEM 3. *LEGAL PROCEEDINGS*

Refer to Note 10, "Commitments and Contingencies" in the Notes to Consolidated Financial Statements for information regarding legal proceedings in which we are involved.

ITEM 4. *MINE SAFETY DISCLOSURES*

Not applicable.

PART II

ITEM 5. *MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES*

Market Information

Our sole class of common equity is our $0.0001 par value common stock, which is listed on the NASDAQ National Market® and is traded under the symbol "SPOK."

Holders of Common Stock

As of February 21, 2020, there were 2,983 holders of record of our common stock.

Dividends

The Company declared dividends totaling $9.9 million and $10.1 million during 2019 and 2018, respectively, and expects to pay dividends of $0.125 per common share each quarter, subject to declaration by the Board of Directors, in 2020. Cash dividends declared for the years ended December 31, 2019 and 2018, respectively, include dividends related to unvested restricted stock units ("RSUs") and shares of unvested restricted common stock ("restricted stock") granted under the Spok Holdings, Inc. Equity Incentive Plan ("Equity Plan") to executives and non-executive members of our Board of Directors. Cash distributions on RSUs and restricted stock are accrued and paid when the applicable vesting conditions are met. Accrued cash distributions on forfeited RSUs and restricted stock are also forfeited.

The following table details information on our dividends declared and cash distributions since the formation of the Company in 2005 through the year ended December 31, 2019:

Year	Dividends Declared Per Share Amount	Total Payment(1)
		(Dollars in thousands)
Prior to 2015	16.900	428,413
2015[(2)]	0.625	13,333
2016[(3)]	0.750	10,287
2017	0.500	15,234
2018	0.500	10,064
2019	$ 0.500	$ 9,819
Total	$ 19.775	$ 487,150

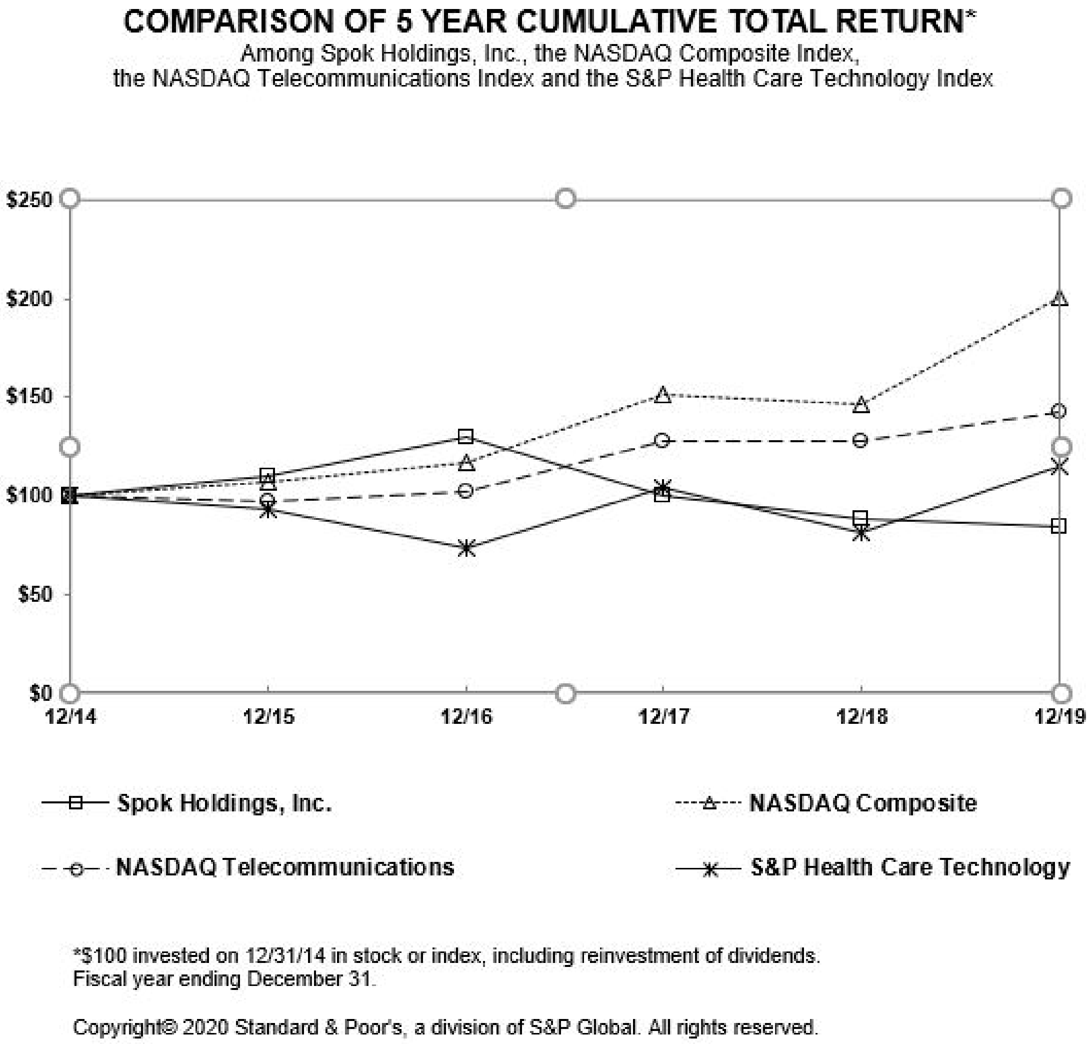
(1) The total payment reflects the cash distributions paid in relation to common stock, vested RSUs and vested shares of restricted stock.
(2) The cash distribution includes an additional special one-time cash distribution to stockholders of $0.125 per share of common stock.
(3) The per share amount includes a special one-time dividend of $0.25 per share of common stock declared in 2016 but payable to stockholders in 2017.

On February 26, 2020, our Board of Directors declared a regular quarterly cash dividend of $0.125 per share of common stock, with a record date of March 16, 2020, and a payment date of March 30, 2020. This cash dividend of approximately $2.4 million is expected to be paid from available cash on hand.

Performance Graph

We began trading on the NASDAQ National Market® on November 17, 2004. The chart below compares the relative changes in the cumulative total return of our common stock for the period December 31, 2014 to December 31, 2019, against the cumulative total return of the NASDAQ Composite Index®, the NASDAQ Telecommunications Index® and the S&P Health Care Technology Index for the same period.

The chart below assumes that on December 31, 2014, $100 was invested in our common stock and in each of the indices. The comparisons assume that all cash distributions were reinvested. The chart indicates the dollar value of each hypothetical $100 investment based on the closing price as of the last trading day of each fiscal year from December 31, 2014 to December 31, 2019.



	December 31,										
		2014		2015		2016		2017		2018		2019
Spok Holdings, Inc.	$	**100.00**	$	**109.38**	$	**129.19**	$	**100.33**	$	**87.90**	$	**84.23**
NASDAQ Composite		**100.00**		**106.96**		**116.45**		**150.96**		**146.67**		**200.49**
NASDAQ Telecommunications		**100.00**		**97.52**		**102.36**		**127.62**		**127.16**		**142.60**
S&P Health Care Technology		**100.00**		**93.06**		**73.26**		**104.22**		**81.10**		**114.37**

Purchases of Equity Securities by the Issuer and Affiliated Purchasers

No common stock was repurchased by the Company (excluding the purchase of common stock for tax withholdings) during the three months ended December 31, 2019.

Repurchased shares of our common stock are accounted for as a reduction to common stock and additional paid-in-capital in the period in which the repurchase occurs. In August 2018, the Company's Board of Directors reset the repurchase authority under the share repurchase program to $10.0 million which was set to expire on December 31, 2018. In November 2018, the Company's Board of Directors extended the repurchase authority through December 31, 2019. The Company fully exhausted the repurchase authority in September 2019.

Transfer Restrictions on Common Stock

In order to reduce the possibility that certain changes in ownership could impose limitations on the use of our deferred income tax assets, our Amended and Restated Certificate of Incorporation contains provisions that generally restrict transfers by or to any 5% stockholder of our common stock or any transfer that would cause a person or group of persons to become a 5% stockholder of our common stock. After a cumulative indirect shift in ownership of more than 45% since our emergence from bankruptcy proceedings in May 2002 through a transfer of our common stock, any transfer of our common stock by or to a 5% stockholder of our common stock or any transfer that would cause a person or group of persons to become a 5% stockholder of such common stock, will be prohibited unless the transferee or transferor provides notice of the transfer to us and our Board of Directors determines in good faith that the transfer would not result in a cumulative indirect shift in ownership of more than 47%.

Prior to a cumulative indirect ownership change of more than 45%, transfers of our common stock will not be prohibited, except to the extent that they result in a cumulative indirect shift in ownership of more than 47%, but any transfer by or to a 5% stockholder of our common stock or any transfer that would cause a person or group of persons to become a 5% stockholder of our common stock requires notice to us. Similar restrictions apply to the issuance or transfer of an option to purchase our common stock, if the exercise of the option would result in a transfer that would be prohibited pursuant to the restrictions described above. These restrictions will remain in effect until the earliest of (1) the repeal of IRC Section 382 (or any comparable successor provision) and (2) the date on which the limitation amount imposed by IRC Section 382 in the event of an ownership change would not be less than the tax attributes subject to these limitations. Transfers by or to us and any transfer pursuant to a merger approved by our Board of Directors or any tender offer to acquire all of our outstanding stock where a majority of the shares have been tendered will be exempt from these restrictions.

Based on publicly available information and after considering any direct knowledge we may have, our combined cumulative change in ownership was an insignificant amount as of December 31, 2019 and 2018.

ITEM 6. *SELECTED FINANCIAL DATA*

The following selected consolidated financial data should be read in conjunction with “Item 7. Management’s Discussion and Analysis of Financial Condition and Statement of Operations,”, the consolidated financial statements and notes thereto, and other financial information appearing elsewhere in this 2019 Form 10-K. The Company adopted Accounting Standards Codification ("ASC") 606, "Revenue from Contracts with Customers" ("ASC 606") on January 1, 2018. Periods prior to January 1, 2018 reflect accounting under ASC 605, "Revenue Recognition" and have not been adjusted for the adoption of ASC 606.

	For the Year Ended December 31,				
	2019	2018	2017	2016	2015
	(Dollars in thousands, except per share amounts)				
Statements of Operations Data:					
Revenues	$ 160,289	$ 169,474	$ 171,175	179,561	189,628
Operating expenses	176,098	172,647	160,469	157,408	164,528
Operating (loss) income	(15,809)	(3,173)	10,706	22,153	25,100
Net (loss) income	(10,765)	(1,479)	(15,306)	13,979	80,246
Basic and diluted net (loss) income per common share	(0.56)	(0.08)	(0.76)	0.68	3.74
Cash dividends declared per common share	0.50	0.50	0.50	0.75	0.625

	December 31,				
	2019	2018	2017	2016	2015
	(Dollars in thousands)				
Balance Sheets Data:					
Current assets	$ 117,665	$ 130,978	$ 144,303	$ 155,862	$ 141,613
Total assets	319,872	327,712	348,004	388,087	386,433
Long-term liabilities, excluding deferred revenue	17,918	7,734	8,075	8,921	8,972
Stockholders’ equity	250,094	274,554	290,529	322,087	329,564

ITEM 7. *MANAGEMENT’S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTSOF OPERATIONS*

The following discussion and analysis should be read in conjunction with our consolidated financial statements and related notes and the discussion under “Organization and Significant Accounting Policies” (refer to Note 1), which describes key estimates and assumptions we make in the preparation of our consolidated financial statements; the cautionary language that appears under the title "Forward Looking Statements" immediately following the Table of Contents; “Item 1. Business,” which describes our operations; and “Item 1A. Risk Factors,” which describes key risks associated with our operations and markets in which we operate. A reference to a “Note” in this section refers to the accompanying Notes to Consolidated Financial Statements.

Overview and Highlights

We are a comprehensive provider of clinical communication and collaboration solutions for enterprises. We offer a suite of unified clinical communication and collaboration solutions that include call center operations, clinical alerting and notifications, one-way and advanced two-way wireless messaging services, mobile communications and public safety response. Our customers rely on Spok for workflow improvement, secure texting, paging services, contact center optimization and public safety response. Our product offerings are capable of addressing a customer’s mission clinical communications needs. We develop, sell and support enterprise-wide systems for healthcare and other organizations needing to automate, centralize and standardize their approach to clinical communications. Our solutions can be found in prominent hospitals, large government agencies, leading public safety institutions, colleges and universities, large hotels, resorts and casinos, and well-known manufacturers. Our primary market has been the healthcare industry, particularly hospitals. We have identified hospitals with 200 or more beds as the primary targets for our software and wireless solutions.

Revenue generated by wireless messaging services (including voice mail, personalized greetings, message storage and retrieval) and equipment loss and/or maintenance protection to both one-way and two-way messaging subscribers is presented as wireless revenue in our statements of operations. Revenue generated by the sale of our software solutions, which includes software license, professional services (installation, consulting and training), equipment procured by us from third parties (to be used in conjunction with our software) and post-contract support (on-going maintenance), is presented as software revenue in our statements of operations. Our software is licensed to end users under an industry standard software license agreement.

2019 Highlights

Total revenue declined by 5.4% or $9.2 million during 2019 compared to 2018, primarily as a result of the continued and expected decline in wireless revenue along with a decrease in license revenues. The rate of decline in wireless revenues continues to trend favorably over the last several years as we saw the lowest level of erosion in the last five years, declining at a rate of only 6.5%.

In the fourth quarter of 2019, we recognized non-cash pre-tax goodwill impairment charges of $8.8 million. Excluding the goodwill impairment, our operating expenses decreased by 3.1% or $5.4 million during 2019 compared to 2018, driven primarily by savings in cost of revenue and general and administrative.

While we continued investment in our development of Spok Go, we anticipate costs will begin to normalize in 2020. We saw growth in development costs decline from 30.8% between 2017 and 2018 to 12.6% from 2018 to 2019. We anticipate the rate of growth will continue to decline through 2020 as we balance the mix of staffing and outside service resources with internal development needs. We made significant progress in our development efforts related to Spok Go and expect to have a product ready for public release in 2020.

We returned approximately $16.4 million of capital to stockholders in the form of cash dividends and share repurchases.

2018 Highlights

Total revenue declined by 1.0% or $1.7 million during 2018 compared to 2017, primarily as a result of moderate growth in software revenue, offset by the continued and expected decline in wireless revenue. This represents a $6.7 million improvement in the decrease of consolidated revenues period over period as compared to the year ended December 31, 2017 and brings us closer to consolidated revenue growth as we continue our transition into a software company. The anticipated rate of decline in wireless revenues has trended favorably over the last several years continuing in 2018 as we saw the lowest level of erosion in the last five years, declining at a rate of only 6.8%.

Our operating expenses increased by 7.6% or $12.2 million during 2018 compared to 2017, driven primarily by our continued investment in the development of Spok Go and the related research and development costs.

We returned approximately $23.6 million of capital to stockholders in the form of cash dividends and share repurchases.

Wireless Revenue

Wireless revenue consists of two primary components: Paging revenue and product and other revenue. Paging revenue consists primarily of recurring fees associated with the provision of messaging services and fees for paging devices and is net of a provision for service credits. Product and other revenue reflects system sales, the sale of devices and charges for paging devices that are not returned and are net of anticipated credits. Our core offering includes subscriptions to one-way or two-way messaging services for a periodic (monthly, quarterly, semiannual, or annual) service fee. This is generally based upon the type of service provided, the geographic area covered, the number of devices provided to the customer and the period of commitment. A subscriber to one-way messaging services may select coverage on a local, regional or nationwide basis to best meet their messaging needs. Two-way messaging is generally offered on a nationwide basis. In addition, subscribers either contract for a messaging device from us for an additional fixed monthly fee or they own a device, having purchased it either from us or from another vendor. We also sell devices to resellers who lease or resell devices to their subscribers and then sell messaging services utilizing our networks. We offer ancillary services, such as voicemail and equipment loss or maintenance protection, which help increase the monthly recurring revenue we receive along with these traditional messaging services. We offer exclusive one-way (T5) and two-way (T52) alphanumeric pagers, which are configurable to support un-encrypted or encrypted operation. When configured for encryption, they utilize AES-128 bit encryption, screen locking and remote wipe capabilities. With encryption enabled, these new secure paging devices enhance our service offerings to the healthcare community by adding HIPAA security capabilities to the low cost, highly reliable and availability benefits of paging (see Item 1. “Business” for more details).

Software Revenue

Software revenue consists of two primary components: operations revenue and maintenance revenue. Operations revenue consists primarily of license revenues for our healthcare communications solutions, revenue from the sale of equipment that facilitate the use of our software solutions, and professional services revenue related to the implementation of our solutions. Maintenance revenue is for ongoing support of our software solutions or related equipment (typically for one year).

The Company adopted ASC 606 on January 1, 2018. Periods prior to January 1, 2018 reflect accounting under ASC 605, "Revenue Recognition" and have not been adjusted for the adoption of ASC 606.

As of 2018, with the adoption of ASC 606, our software licenses and hardware are generally recognized at a point in time when we have transferred control to the customer. For software licenses, revenue is not recognized until the related license(s) has been made available to the customer and the customer can begin to benefit from its right to use the license(s). Our software licenses represent a right to use Spok’s intellectual property ("IP") as it exists at the point in time at which the license is granted. Many of our software licenses have significant standalone functionality due to their ability to process a transaction or perform a function or task, and we do not need to maintain those products, once provided to the customer, for value to exist. While the functionality of IP that we license may substantively change during the license period, customers are not contractually or practically required to update their license as a result of those changes. Our wireless, professional and maintenance services are generally recognized over time due to a customer's simultaneous receipt and consumption of the benefit as we perform the work. As we transfer control over time, we recognize revenue based on the extent of progress towards completion of the performance obligation. The selection of the method to measure progress towards completion requires significant judgment and is based on the nature of the products or services to be provided. Generally, we use the time-elapsed measure of progress for performance obligations which include wireless or maintenance services. We believe this method best depicts the simultaneous transfer and consumption of the benefit based on our performance as these services are generally considered standby services. For professional services, we leverage an input methodology based on the number of hours worked on a project versus the total expected hours necessary to complete the project. Revenues are recognized proportionally as hours are incurred.

Operating Expenses

Our operating expenses are presented in functional categories. Certain of our functional categories are especially important to overall expense control and management. These operating expenses are categorized as follows:

- *Cost of revenue*. These are expenses primarily for hardware, third-party software, outside service expenses and payroll and related expenses for our professional services, logistics, customer support and maintenance staff.
- *Research and Development.* These expenses relate primarily to the development of new software products and the ongoing maintenance and enhancement of existing products. This classification consists primarily of employee payroll and related expenses, outside services related to the design, development, testing and enhancement of our solutions and to a lesser extent hardware equipment.
- *Technology operations*. These are expenses associated with the operation of our paging networks. Expenses consist largely of site rent expenses for transmitter locations, telecommunication expenses to deliver messages over our paging networks, and payroll and related expenses for our engineering and pager repair functions. We actively pursue opportunities to consolidate transmitters and other service, rental and maintenance expenses in order to maintain an efficient network while simultaneously ensuring adequate service for our customers. We believe continued reductions in these expenses will occur for the foreseeable future as our networks continue to be consolidated.
- *Selling and marketing*. The sales and marketing staff are involved in selling our communication solutions primarily in the United States. These expenses support our efforts to maintain gross placements of units in service, which mitigated the impact of disconnects on our wireless revenue base, and to identify business opportunities for additional or future software sales. We have a centralized marketing function, which is focused on supporting our products and vertical sales efforts by strengthening our brand, generating sales leads and facilitating the sales process. These marketing functions are accomplished through targeted email campaigns, webinars, regional and national user conferences, monthly newsletters and participation at industry trade shows. Expenses consist largely of payroll and related expenses, commissions and other costs such as travel and advertising costs.
- *General and administrative*. These are expenses associated with information technology and administrative functions which includes finance and accounting, human resources and executive management. This classification consists primarily of payroll and related expenses, outside service expenses, taxes, licenses and permit expenses, and facility rent expenses.

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Results of Operations

The following table is a summary of our Consolidated Statements of Operations for the years ended December 31, 2019, 2018 and 2017:

(Dollars in thousands)	2019	Change		2018	Change		2017
Revenues:							
Wireless	$ 88,167	(6,110)	(6.5)%	$ 94,277	$ (6,911)	(6.8)%	$ 101,188
Software	72,122	(3,075)	(4.1)%	75,197	5,210	7.4 %	69,987
Total revenue	160,289	(9,185)	(5.4)%	169,474	(1,701)	(1.0)%	171,175
Operating expenses:							
Cost of revenue	30,072	(2,336)	(7.2)%	32,408	3,990	14.0 %	28,418
Research and development	27,543	3,079	12.6 %	24,464	5,762	30.8 %	18,702
Technology operations	31,428	72	0.2 %	31,356	(146)	(0.5)%	31,502
Selling and marketing	23,170	(1,383)	(5.6)%	24,553	1,730	7.6 %	22,823
General and administrative	45,787	(3,310)	(6.7)%	49,097	1,697	3.6 %	47,400
Goodwill impairment	8,849	8,849	100.0 %	—	—	— %	—
Depreciation, amortization and accretion	9,249	(1,520)	(14.1)%	10,769	(855)	(7.4)%	11,624
Total operating expenses	176,098	3,451	2.0 %	172,647	12,178	7.6 %	160,469
Operating (loss) income	(15,809)	(12,636)	398.2 %	(3,173)	(13,879)	(129.6)%	10,706
Interest income	1,651	13	0.8 %	1,638	919	127.8 %	719
Other income (expense)	735	1,385	(213.1)%	(650)	(784)	(585.1)%	134
(Loss) income before income tax benefit (expense)	(13,423)	(11,238)	514.3 %	(2,185)	(13,744)	(118.9)%	11,559
Benefit from (provision for) income taxes	2,658	1,952	276.5 %	706	27,571	(102.6)%	(26,865)
Net loss	$ (10,765)	$ (9,286)	627.9 %	$ (1,479)	$ 13,827	(90.3)%	$ (15,306)
Supplemental information							
FTEs	638	42	7.0 %	596	—	— %	596
Active transmitters	3,840	(94)	(2.4)%	3,934	(96)	(2.4)%	4,030

Revenue

The table below details total revenue for the periods stated:

(Dollars in thousands)	2019	Change		2018	Change		2017
Revenue - wireless							
Paging revenue	$ 85,067	$ (5,503)	(6.1)%	$ 90,570	$ (6,726)	(6.9)%	$ 97,296
Product and other revenue	3,100	(607)	(16.4)%	3,707	(185)	(4.8)%	3,892
Total wireless revenue	88,167	(6,110)	(6.5)%	94,277	(6,911)	(6.8)%	101,188
Revenue - software							
License	8,950	(4,092)	(31.4)%	13,042	3,501	36.7 %	9,541
Services	19,189	1,098	6.1 %	18,091	461	2.6 %	17,630
Equipment	3,618	(1,377)	(27.6)%	4,995	848	20.4 %	4,147
Operations revenue	31,757	(4,371)	(12.1)%	36,128	4,810	15.4 %	31,318
Maintenance revenue	40,365	1,296	3.3 %	39,069	400	1.0 %	38,669
Total software revenue	72,122	(3,075)	(4.1)%	75,197	5,210	7.4 %	69,987
Total revenue	$ 160,289	$ (9,185)	(5.4)%	$ 169,474	$ (1,701)	(1.0)%	$ 171,175

The decrease in wireless revenue during 2019 compared to both 2018 and 2017, respectively, reflects the decrease in demand for our wireless services. Wireless revenue is generally based upon the number of units in service and the monthly Average Revenue Per User ("ARPU"). On a consolidated basis ARPU is affected by several factors, including the mix of units in service and the pricing of the various components of our services. The number of units in service changes based on subscribers added, referred to as gross placements, less subscriber cancellations, or disconnects. ARPU for the years ended December 31, 2019, 2018 and 2017 was $7.34, $7.39 and $7.51, respectively, while total units in service were 0.9 million for the year ended December 31, 2019, 1.0 million for the year ended December 31, 2018 and 1.0 million for the year ended December 31, 2017. While demand for wireless services continues to decline, it has done so at a slower rate for each of the periods presented. While we are encouraged that this trend will continue in future periods, we believe that demand will continue to decline for the foreseeable future in line with recent and historical trends. As our wireless products and services are replaced with other competing technologies, such as the shift from narrow band wireless service offerings to broad band technology services, our wireless revenue will continue to decrease.

The following reflects the impact of subscribers and ARPU on the change in wireless revenue:

	Units in Service as of December 31,			Revenue for the Year Ended December 31,			Change Due To:	
	2019	2018	Change	2019	2018	Change	ARPU	Units
	(Units in thousands)			(Dollars in thousands)				
Total	938	992	(54)	$ 85,067	$ 90,570	$ (5,503)	$ (583)	$ (4,920)

	Units in Service as of December 31,			Revenue for the Year Ended December 31,			Change Due To:	
	2018	2017	Change	2018	2017	Change	ARPU	Units
	(Units in thousands)			(Dollars in thousands)				
Total	992	1,049	(57)	$ 90,570	$ 97,296	$ (6,726)	$ (1,395)	$ (5,331)

As demand for one-way and two-way messaging has declined, we have developed or added service offerings such as encrypted paging and Spok Mobile with a pager number in order to increase our revenue potential and mitigate the decline in our wireless revenue. We will continue to explore ways to innovate and provide customers the highest value possible.

The decrease in software operations revenue during 2019 when compared to 2018 primarily resulted from the delivery of fewer software licenses and hardware products partially offset by an increase in services revenue stemming from stronger utilization rates and more efficient projects. The mix of sales in 2019 reflected a greater trend towards upgrade projects, which primarily consist of professional services, as we look to position our customer base for successful transition to Spok Go when available. Upgrade sales are generally weighted more heavily towards professional service revenues whereas new customer sales generally have a greater mix of license and equipment revenues. The increase in software operations revenue during 2018 when compared to 2017 primarily reflects an increase in the size and value of projects being worked during 2018 as compared to the same period in 2017 as well as the acceleration of license revenue due to a change in revenue rules resulting from the adoption of ASC 606.

The continued increase in maintenance revenue for each of the periods stated reflects our continuing success in renewals of our maintenance support for existing software solutions and in maintenance support for sales of new solutions. The renewal rates for maintenance revenue, including the annual uplifts, for the years ended December 31, 2019, 2018 and 2017 were in excess of 99%.

Operating Expenses

Certain immaterial prior period amounts, within individual operating expense categories, have been reclassified to conform to the current period's presentation. These reclassifications had no effect on the reported results of operations nor did they have any effect on the total operating expense amounts they are a part of.

Cost of revenue. Cost of revenue consisted primarily of the following items:

Cost of revenue	2019	Change		2018	Change		2017
(Dollars in thousands)							
Payroll and related	$ 20,001	$ 466	2.4 %	$ 19,535	$ 1,729	9.7 %	$ 17,806
Cost of sales	7,825	(2,746)	(26.0)%	10,571	2,453	30.2 %	8,118
Stock based compensation	267	18	7.2 %	249	70	39.1 %	179
Other	1,979	(74)	(3.6)%	2,053	(262)	(11.3)%	2,315
Total cost of revenue	$ 30,072	$ (2,336)	(7.2)%	$ 32,408	$ 3,990	14.0 %	$ 28,418
FTEs	202	24	13.5 %	178	(7)	(3.8)%	185

Cost of revenue expense decreased for the year ended December 31, 2019 compared to December 31, 2018 primarily due to the decrease in cost of sales partially offset by an increase in payroll and related expenses. The decrease in cost of sales is primarily related to lower hardware revenues with a corresponding decrease in related costs as well as lower use of third-party resources for professional services. The increase in payroll and related expenses is primarily related to an increase in headcount and general pay increases partially offset by lower benefit costs.

Cost of revenue expense increased for the year ended December 31, 2018 compared to December 31, 2017 primarily due to the increase in cost of sales and payroll and benefits. The increase in cost of sales is primarily due to an increase in the usage of third party implementation resources and an increase in equipment revenue which caused a corresponding increase in cost of sales.

Research and development. Research and development consisted primarily of the following items:

Research and development	2019	Change		2018	Change		2017
(Dollars in thousands)							
Payroll and related	$ 19,040	$ 1,473	8.4%	$ 17,567	$ 2,830	19.2%	$ 14,737
Outside services	7,426	1,277	20.8%	6,149	2,763	81.6%	3,386
Stock based compensation	310	74	31.4%	236	144	156.5%	92
Other	767	255	49.8%	512	25	5.1%	487
Total research and development	$ 27,543	$ 3,079	12.6%	$ 24,464	$ 5,762	30.8%	$ 18,702
FTEs	132	11	9.1%	121	10	9.0%	111

Research and development expense increased for the year ended December 31, 2019 compared to the same periods in 2018 and 2017 primarily as a result of our anticipated increases in payroll and benefits and outside service related costs as we continue to focus on the development efforts of our software solutions. We intend to continue these efforts based on their importance to our continued success and do not anticipate a return to historically low costs. However, increases in staffing and the use of outside services have grown at a slower pace in 2019 when compared to prior years. These costs will continue to substantially impact margins and our cash flow from operations as the benefits from our development efforts will not be realized for at least one to three years. We anticipate that certain of these costs will begin to qualify for capitalization under accounting principles generally accepted in the United States ("GAAP") beginning in early 2020 as it relates to the development of the Spok Go and these amounts will likely be material. Refer to "Item 1. Business," which describes our development efforts in further detail.

Technology operations. Technology operations consisted primarily of the following items:

Technology Operations	2019	Change		2018	Change		2017
(Dollars in thousands)							
Payroll and related	$ 10,788	$ (4)	— %	$ 10,792	$ 525	5.1 %	$ 10,267
Site rent	13,715	(233)	(1.7)%	13,948	(281)	(2.0)%	14,229
Telecommunications	4,058	253	6.6 %	3,805	(318)	(7.7)%	4,123
Stock based compensation	123	28	29.5 %	95	16	20.3 %	79
Other	2,744	28	1.0 %	2,716	(88)	(3.1)%	2,804
Total technology operations	$ 31,428	$ 72	0.2 %	$ 31,356	$ (146)	(0.5)%	$ 31,502
FTEs	92	—	— %	92	—	— %	92

Technology operations expense was relatively flat for the year ended December 31, 2019 compared to December 31, 2018 primarily due to an increase in telecommunications and other minor expenses partially offset by the reductions in site rent. For the year end December 31, 2018 compared to December 31, 2017 technology operation decreased primarily due to reductions in site rent and telecommunications partially offset by increase in payroll due to an increase in benefit expenses. The number of active transmitters declined 2.4% from December 31, 2018 to December 31, 2019 and 2.4% from December 31, 2017 to December 31, 2018. The number of active transmitters directly relates to the amount of site rent expenses we generally incur on a recurring basis. As we reach certain minimum frequency commitments, as outlined by the FCC, we will be unable to continue our efforts to rationalize and consolidate our networks.

Selling and marketing. Selling and marketing consisted primarily of the following items:

Selling and marketing	2019	Change		2018	Change		2017
(Dollars in thousands)							
Payroll and related	$ 13,508	$ 456	3.5 %	$ 13,052	$ 1,256	10.6 %	$ 11,796
Commissions	4,994	(1,158)	(18.8)%	6,152	961	18.5 %	5,191
Stock based compensation	590	87	17.3 %	503	126	33.4 %	377
Advertising and events	3,326	(921)	(21.7)%	4,247	(306)	(6.7)%	4,553
Other	752	153	25.5 %	599	(307)	(33.9)%	906
Total selling and marketing	$ 23,170	$ (1,383)	(5.6)%	$ 24,553	$ 1,730	7.6 %	$ 22,823
FTEs	105	8	8.2 %	97	4	4.3 %	93

Selling and marketing expense decreased for the year ended December 31, 2019 compared to December 31, 2018 primarily due to a decrease in commissions and advertising and events expense partially offset by an increase in payroll and related expenses. The decrease in commissions expense primarily relates to the mix of revenue and the related commissions associated with those revenues. Commissions were paid at a lower rate on revenues that were recognized for the year ended December 31, 2019 as compared to the same period in 2018. The increase in payroll and related expenses is primarily related to an increase in head count. The decrease in advertising and events expenses is largely due to management's focused efforts to reduce marketing costs to augment research and development initiatives.

Selling and marketing expense increased for the year ended December 31, 2018 compared to December 31, 2017 primarily due to an increase in benefits expenses due to higher medical benefit costs incurred across our employee base. The increase in commissions expense for the year ended December 31, 2018 primarily relates to the increase in operations revenue and the adoption of ASC 606.

General and administrative. General and administrative consisted primarily of the following items:

General and administrative	2019	Change		2018	Change		2017
(Dollars in thousands)							
Payroll and related	$ 16,372	$ (1,305)	(7.4)%	$ 17,677	$ 599	3.5 %	$ 17,078
Stock based compensation	2,353	(1,518)	(39.2)%	3,871	910	30.7 %	2,961
Facility rent and office costs	9,099	(862)	(8.7)%	9,961	(11)	(0.1)%	9,972
Outside services	8,437	646	8.3 %	7,791	(359)	(4.4)%	8,150
Taxes, licenses and permits	3,672	377	11.4 %	3,295	(926)	(21.9)%	4,221
Bad debt	669	(955)	(58.8)%	1,624	1,096	207.6 %	528
Other	5,185	307	6.3 %	4,878	388	8.6 %	4,490
Total general and administrative	$ 45,787	$ (3,310)	(6.7)%	$ 49,097	$ 1,697	3.6 %	$ 47,400
FTEs	107	(1)	(0.9)%	108	(7)	(6.1)%	115

For the years ended December 31, 2018 and 2017, we reclassified $3.6 million and $2.3 million from outside services to facility rent and office costs, respectively, to conform to current period presentation. These costs primarily related to software and other technology costs.

General and administrative expense decreased for the year ended December 31, 2019 compared to December 31, 2018 primarily due to a decrease in payroll and related, stock-based compensation, and bad debt expense. The decrease in payroll and related expenses is primarily due to a decrease in headcount, benefit related costs, and expenses related to the resignation of a named executive officer ("NEO"). The decrease in stock-based compensation is largely due to forfeitures related to the previously mentioned NEO resignation for the year ended December 31, 2019 when compared to the same period in 2018. The decrease in facility rent and office costs is related to the decrease in telephone and computer hardware and software costs. The decrease in bad debt expense is primarily related to a return to normal operating expectations as compared to 2018 and to a lesser extent, improvements in our collections. In 2018 a change in methodology was implemented, meant to provide additional coverage for our exposure to potentially uncollectible accounts receivable, which resulted in an increase in bad debt expense for the year ended December 31, 2018 which was not incurred during the year ended December 31, 2019.

General and administrative expense increased for the year ended December 31, 2018 compared to December 31, 2017 primarily due to an increase in benefits expenses due to higher medical benefit costs incurred across our employee base, stock compensation, outside services and bad debt. The increase in stock based compensation is largely related to additional grants made during the year ended December 31, 2018 which replace awards that vested on December 31, 2017 but were amortized at 50% of the original award due to anticipated forfeitures related to unmet performance obligations. The increase in bad debt is related to providing for our estimated exposure to potentially uncollectible accounts receivable.

Depreciation, amortization and accretion. For the year ended December 31, 2019 compared to the same period in 2018 depreciation, amortization and accretion expenses decreased by $1.5 million primarily due to certain paging assets becoming fully depreciated in 2018 and continued efforts to reduce capital expenditures. The decrease of $0.9 million in depreciation, amortization and accretion expenses for the year ended December 31, 2018 compared to the same period in 2017 was due primarily to various assets becoming fully depreciated during 2018.

Goodwill impairment. In the fourth quarter of 2019, we recognized non-cash pre-tax goodwill impairment charges of $8.8 million. The goodwill impairment relates to impairment charges recognized in the fourth quarter of 2019 as a result of the Company's annual goodwill impairment testing and, in our belief, does not reflect management's confidence in the future value of our business. Despite the impairment of goodwill, our outlook for the business continues to remain strong. We believe the launch of Spok Go is set to meet a significant need in the healthcare marketplace and will create significant value for shareholders in the coming years. Refer to Note 1, "Organization and Significant Accounting Policies", and Note 6, "Goodwill and Intangible Assets, Net", for further discussion.

Interest income, Other income (expense), and Income tax (benefit) expense

Interest income. Interest income increased slightly for the year ended December 31, 2019, compared to the same periods in 2018 and 2017, respectively, primarily due to interest earned on the Company's cash balances and short term investments due to increased investments in short-term treasury bonds.

Other income (expense). For the year ended December 31, 2019 compared to the same period in 2018, other income (expense) increased by $1.4 million primarily as a result of various immaterial expenses incurred in 2018 that were not subsequently incurred during 2019 and an increase in gains on foreign currency. The decrease of $0.8 million in other income (expense) for the year ended December 31, 2018 compared to the same period in 2017 was primarily a result of legal and other expenses related to the lawsuit previously reported in the 2017 Annual Report and our Quarterly Report on Form 10-Q for the quarterly period ended March 31, 2018.

Benefit from (provision for) income taxes. The effects of foreign taxes are immaterial for all periods presented. The following is the effective tax rate reconciliation for the years ended December 31, 2019, 2018 and 2017, respectively (See Note 9, "Income Taxes", for further discussion on our income taxes):

Effective tax rate reconciliation	**2019**		**2018**		**2017**	
(Dollars in thousands)						
(Loss) income before income tax (benefit) expense	$ (13,423)		$ (2,185)		$ 11,559	
Income taxes computed at the Federal statutory rate	$ (2,819)	21.0 %	$ (459)	21.0 %	$ 4,046	35.0 %
State income taxes, net of Federal benefit	(567)	4.2 %	306	(14.0)%	472	4.1 %
Goodwill impairment	2,243	(16.7)%	—	— %	—	— %
Impact of 2017 Tax Act	—	— %	—	— %	24,235	209.7 %
Research and development and other tax credits	(1,790)	13.3 %	(1,144)	52.4 %	(1,775)	(15.4)%
Excess executive compensation	322	(2.4)%	281	(12.9)%	—	— %
Other	(47)	0.4 %	310	(14.2)%	(113)	(1.0)%
(Benefit from) provision for income taxes	$ (2,658)	19.8 %	$ (706)	32.3 %	$ 26,865	232.4 %

Benefit from income taxes increased by $2.0 million for the year ended December 31, 2019 compared to the same period in 2018 due primarily to an overall increase in pretax book loss partially offset by the add back of goodwill that was impaired and an increase in research and development and other tax credits. Our investment in research and development qualifies for the research and development income tax credit under Section 41 of the Internal Revenue Code. Unused research and development tax credits have a 20-year carryover and will provide future tax benefits once Spok's net operating losses are fully utilized.

Liquidity and Capital Resources

Cash and Cash Equivalents

At December 31, 2019, we had cash and cash equivalents of $47.4 million. The available cash and cash equivalents are held in accounts managed by third-party financial institutions and consist of invested cash and cash in our operating accounts. The invested cash is invested in interest bearing funds managed by third-party financial institutions. These funds invest in direct obligations of the government of the United States. To date, we have experienced no loss or lack of access to our invested cash or cash equivalents; however, we can provide no assurance that access to our invested cash and cash equivalents will not be impacted by adverse market conditions.

We maintain a level of liquidity sufficient to allow us to meet our cash needs in both the short-term and long-term. At any point in time, we have approximately $7.0 to $12.0 million in our operating accounts that are with third-party financial institutions. While we monitor daily the cash balances in our operating accounts and adjust the cash balances as appropriate, these cash balances could be impacted if the underlying financial institutions fail or are subject to other adverse conditions in the financial markets. To date, we have experienced no loss or lack of access to cash in our operating accounts.

We intend to use our cash on hand to provide working capital, to support operations, to invest in our business and to return value to stockholders through cash dividends and possible repurchases of our common stock. We may also consider using cash to fund or complete opportunistic investments and acquisitions that we believe will provide a measure of growth or revenue stability while supporting our existing operations. Because we intend to increase substantially our investment in developing the Spok Go platform over the next two or three years, commensurate with declining revenues from our wireless business, we anticipate that our cash on hand will decrease significantly during that period and possibly longer until revenues from Spok Go begins to be realized.

Cash Flows Overview

In the event that net cash provided by operating activities and cash on hand are not sufficient to meet future cash requirements, we may be required to reduce planned capital expenses, reduce or eliminate our cash dividends to stockholders, not resume our common stock repurchase program, and/or sell assets or seek additional financing. We can provide no assurance that reductions in planned capital expenses or proceeds from asset sales would be sufficient to cover shortfalls in available cash or that additional financing would be available on acceptable terms.

Based on current and anticipated levels of operations, we anticipate net cash provided by operating activities, together with the available cash on hand at December 31, 2019, should be adequate to meet anticipated cash requirements for the foreseeable future.

The following table sets forth information on our net cash flows from operating, investing, and financing activities for the periods stated:

	For the Year Ended December 31,		
	2019	**2018**	**2017**
		(Dollars in thousands)	
Cash provided by operating activities	$ 11,693	$ 10,315	$ 15,515
Cash used in investing activities	(30,222)	(5,826)	(9,171)
Cash used in financing activities	(17,153)	(24,276)	(25,001)

Cash Provided by Operating Activities. As discussed above, we are dependent on cash flows from operating activities to meet our cash requirements. Cash from operations varies depending on changes in various working capital items, including deferred revenues, accounts payable, accounts receivable, prepaid expenses and various accrued expenses.

Cash provided by operating activities in 2019 was $11.7 million, due primarily to non-cash items such as goodwill impairment of $8.8 million, depreciation, amortization and accretion of $9.2 million, stock-based compensation of $3.6 million, and other non-cash items of $0.7 million, partially offset by the 2019 net loss of $10.8 million and deferred income benefit of $3.2 million. Cash provided by operating activities also increased resulting from changes in prepaids and other assets of $2.9 million and accounts receivable of $1.0 million and deferred revenue of $0.1 million, partially offset by a change in accounts payable, accrued liabilities and other of $0.6 million.

Cash provided by operating activities in 2018 was $10.3 million, due primarily to non-cash items such as depreciation, amortization and accretion of $10.8 million, stock-based compensation of $4.9 million and other non-cash items of $1.9 million, partially offset by the 2018 net loss of $1.5 million and deferred income benefit of $1.7 million. Cash provided by operating activities was partially offset resulting from changes in accounts receivable of $0.9 million, prepaids and other assets of $0.6 million, accounts payable, accrued liabilities and other of $1.7 million and deferred revenue of $0.9 million.

Cash provided by operating activities in 2017 was $15.5 million, due primarily to non-cash items such as depreciation, amortization and accretion of $11.6 million, stock-based compensation of $3.7 million, deferred income tax of $25.4 million and other non-cash items of $0.2 million, partially offset by the 2019 net loss of $15.3 million. Cash provided by operating activities was partially offset resulting from changes in accounts receivable of $9.6 million and accounts payable, accrued liabilities and other of $3.3 million, partially offset by a change in prepaids and other assets of $0.2 million and deferred revenue of $2.6 million.

Cash Used in Investing Activities. Cash used in investing activities in 2019, 2018, and 2017 was $30.2 million, $5.8 million, and $9.2 million, respectively, due primarily to the purchase and maturity of U.S. treasury securities, as well as purchases of property and equipment.

Cash Used in Financing Activities. Cash used in financing activities was $17.2 million, $24.3 million, and $25.0 million for the years ended December 31, 2019, 2018, and 2017, respectively, primarily due to cash distributions to stockholders and the purchase of common stock.

Cash Dividends to Stockholders. For the year ended December 31, 2019, we paid a total of $9.8 million in cash dividends compared to $10.1 million and $15.2 million in cash dividends for 2018 and 2017, respectively. In 2016, a special dividend of $0.25 per common stock was declared and paid in 2017.

Future Cash Dividends to Stockholders. On February 26, 2020, our Board of Directors declared a regular quarterly cash dividend of $0.125 per share of common stock, with a record date of March 16, 2020, and a payment date of March 30, 2020. This cash dividend of approximately $2.4 million is expected to be paid from available cash on hand.

Common Stock Repurchase Program. For the year ended December 31, 2019, we purchased 532,354 shares of our common stock under the repurchase program for $6.6 million excluding commissions. The repurchase authority allowed us, at management's discretion, to selectively repurchase shares of our common stock from time to time in the open market depending upon market price and other factors.

In August 2018, the Company's Board of Directors reset the repurchase authority under the share repurchase program to $10.0 million which was set to expire on December 31, 2018. In November 2018, the Company's Board of Directors extended the repurchase authority through December 31, 2019. The Company fully exhausted the repurchase authority in September 2019 (See Note 8, "Stockholders' Equity", for further discussion on our common stock repurchase program).

Other. For 2020, the Board of Directors currently expects to pay dividends of $0.125 per common share each quarter, subject to declaration by the Board of Directors.

Commitments and Contingencies

Contractual Obligations. The following table provides the Company's significant commitments and contractual obligations as of December 31, 2019.

	Payments Due by Period				
(Dollars in thousands)	**Total**	**Less than 1 Year**	**1 to 3 years**	**3 to 5 years**	**More than 5 years**
Operating lease obligations	$ 17,570	$ 6,792	$ 8,095	$ 2,466	$ 217
Unconditional purchase obligations	$ 2,188	$ —	$ 2,188	$ —	$ —
Total contractual obligations	$ 19,758	$ 6,792	$ 10,283	$ 2,466	$ 217

As of December 31, 2019, our contractual payment obligations under our operating leases for office and transmitter locations are indicated in the table above. For purposes of the table above, purchase obligations are defined as agreements to purchase goods or services that are enforceable, legally binding, noncancelable, have a remaining term in excess of one year and that specify all significant terms, including: fixed or minimum quantities to be purchased; fixed, minimum or variable pricing provisions; and the approximate timing of transactions. The amounts are based on our contractual commitments; however, it is possible that we may be able to negotiate lower payments if we choose to exit these contracts before their expiration date. Refer to Note 10, "Commitments and Contingencies," for further discussion on commitments and contingencies.

Off-Balance Sheet Arrangements. We do not have any relationships with unconsolidated entities or financial partnerships, such as entities often referred to as structured finance or special purpose entities, which would have been established for the purpose of facilitating off-balance sheet arrangements or other contractually narrow or limited purposes. As such, we are not exposed to any financing, liquidity, market or credit risk that could arise if we had engaged in such relationships.

Related Parties

Refer to Note 12, "Related Parties," for further discussion on our related party transactions.

Inflation

Inflation has not had a material effect on our operations to date. System equipment and operating costs have not significantly increased in price, and the price of wireless messaging devices has tended to decline in recent years. Our general operating expenses, such as salaries, site rent for transmitter locations, employee benefits and occupancy costs, are subject to normal inflationary pressures.

Critical Accounting Policies and Estimates

Refer to Note 1, "Organization and Significant Accounting Policies," for a summary of significant accounting policies and estimates.

Refer to Note 2, "Recent and Pending Accounting Standards," for a summary of recent and pending accounting standards.

ITEM 7A. *QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK*

Interest Rate Risk

At December 31, 2019, we had no outstanding borrowings or associated debt service requirements.

Foreign Currency Exchange Rate Risk

We conduct a limited amount of business outside the United States. The financial impact of transactions billed in foreign currencies is immaterial to our financial results and, consequently, we do not have any material exposure to the risk of foreign currency exchange rate fluctuations.

ITEM 8. *FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA*

The consolidated financial statements are included in this Report beginning on Page F-1.

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ITEM 9. *CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE*

There are no reportable events.

ITEM 9A. *CONTROLS AND PROCEDURES*

Evaluation of Disclosure Controls and Procedures

Our management carried out an evaluation, as required by Rule 13a-15(b) of the Securities Exchange Act of 1934, as amended (the “Exchange Act”), with the participation of our principal executive officer and our principal financial officer, of the effectiveness of our disclosure controls and procedures, as of the end of our last fiscal year. Disclosure controls and procedures are defined under Rule 13a-15(e) under the Exchange Act as controls and other procedures of an issuer that are designed to ensure that the information required to be disclosed by the issuer in the reports that it files or submits under the Exchange Act (i) is recorded, processed, summarized and reported within the time periods specified in SEC rules and forms, and (ii) is accumulated and communicated to the issuer’s management, including its principal executive officer and principal financial officer, or persons performing similar functions, as appropriate to allow timely decisions regarding required disclosure. Based upon this evaluation, our principal executive officer and our principal financial officer have concluded that our disclosure controls and procedures were effective as of December 31, 2019.

Management’s Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as defined in the Exchange Act Rule 13a-15(f) and 15d-15(f). Management conducted an evaluation of the effectiveness of our internal control over financial reporting based on the 2013 *Internal Control — Integrated Framework* issued by the Committee of Sponsoring Organizations of the Treadway Commission (“COSO”).

Such internal controls include those policies and procedures that:

- pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of the assets of the Company;
- provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with GAAP, and that receipts and expenditures are being made only in accordance with authorizations of management and members of the Board of Directors of the Company; and
- provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our 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. 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.

Based on our evaluation under the 2013 *Internal Control — Integrated Framework*, our management concluded that our internal control over financial reporting was effective as of December 31, 2019.

The effectiveness of our internal control over financial reporting as of December 31, 2019 has been audited by Grant Thornton LLP, an independent registered public accounting firm, as stated in their report which appears in this 2019 Form 10-K.

Changes in Internal Control Over Financial Reporting

There were no changes made in the Company’s internal control over financial reporting during the quarter ended December 31, 2019 that have materially affected, or are reasonably likely to materially affect, the Company’s internal control over financial reporting**.**

ITEM 9B. ***OTHER INFORMATION***

None.

PART III

Certain information called for by Items 10 through 14 is incorporated by reference from Spok's definitive Proxy Statement for our 2020 Annual Meeting of Stockholders, which will be filed with the SEC no later than April 29, 2020.

ITEM 10. *DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE*

The following information required by this item is incorporated by reference from Spok's definitive Proxy Statement for our 2020 Annual Meeting of Stockholders:

- information regarding directors is set forth under the caption "Election of Directors";
- information regarding executive officers is set forth under the caption "Executive Officers";
- information regarding our audit committee and designated "audit committee financial expert" is set forth under the caption "Committees of the Board of Directors"; and
- if applicable, information regarding compliance with Section 16(a) of the Exchange Act is set forth under the caption "Delinquent Section 16(a) Reports."

We also make available on our website, and in print, if any stockholder or other person so requests, our code of business conduct and ethics entitled "Code of Ethics" which is applicable to all employees and directors, our "Corporate Governance Guidelines," and the charters for all committees of our Board of Directors, including Audit, Compensation and Nominating and Governance. Any changes to our Code of Ethics or waiver, if any, of our Code of Ethics for executive officers or directors will be posted on that website.

ITEM 11. *EXECUTIVE COMPENSATION*

The information required by this item is incorporated by reference from the section of Spok's definitive Proxy Statement for our 2020 Annual Meeting of Stockholders entitled "Compensation Discussion and Analysis."

ITEM 12. *SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS*

The information required by this item is incorporated by reference from the section of Spok's definitive Proxy Statement for our 2020 Annual Meeting of Stockholders entitled "Security Ownership of Certain Beneficial Owners and Management."

ITEM 13. *CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE*

The information required by this item with respect to certain relationships and related transactions is incorporated by reference from the section of Spok's definitive Proxy Statement for our 2020 Annual Meeting of Stockholders entitled "Related Person Transactions and Code of Conduct." The information required by this item with respect to director independence is incorporated by reference from the section of Spok's definitive Proxy Statement for our 2020 Annual Meeting of Stockholders entitled "Board of Directors and Governance Matters."

ITEM 14. *PRINCIPAL ACCOUNTING FEES AND SERVICES*

The information required by this item is incorporated by reference from the section of Spok's definitive Proxy Statement for our 2020 Annual Meeting of Stockholders entitled "Independent Registered Public Accounting Firm Fees."

PART IV

ITEM 15. *EXHIBITS, FINANCIAL STATEMENT SCHEDULES*

The following documents are filed as part of this Form 10-K:

(a) 1. *Financial Statements*

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2. *Financial Statement Schedules*

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(b) *Exhibits*

The exhibits listed in the accompanying index to exhibits, that follows the Signatures page, are filed as part of this Form 10-K.

ITEM 16. FORM 10-K SUMMARY

None.

SIGNATURES

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

Spok Holdings, Inc.

By: /s/ Vincent D. Kelly

Vincent D. Kelly
President and Chief Executive Officer
February 27, 2020

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

Signature	Title	Date
/s/ Vincent D. Kelly Vincent D. Kelly	Director, President and Chief Executive Officer (principal executive officer)	February 27, 2020
/s/ Michael W. Wallace Michael W. Wallace	Chief Financial Officer (principal financial officer and principal accounting officer)	February 27, 2020
/s/ Royce Yudkoff Royce Yudkoff	Chairman of the Board	February 27, 2020
/s/ N. Blair Butterfield N. Blair Butterfield	Director	February 27, 2020
/s/ Stacia A. Hylton Stacia A. Hylton	Director	February 27, 2020
/s/ Brian O’Reilly Brian O’Reilly	Director	February 27, 2020
/s/ Matthew Oristano Matthew Oristano	Director	February 27, 2020
/s/ Todd Stein Todd Stein	Director	February 27, 2020
/s/ Samme L. Thompson Samme L. Thompson	Director	February 27, 2020
/s/ Dr. Bobbie Byrne Dr. Bobbie Byrne	Director	February 27, 2020

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Board of Directors and Stockholders
Spok Holdings, Inc.

Opinion on the financial statements

We have audited the accompanying consolidated balance sheets of Spok Holdings, Inc. (a Delaware corporation) and subsidiaries (the "Company") as of December 31, 2019 and 2018, the related consolidated statements of comprehensive operations, comprehensive loss, changes in stockholders' equity, and cash flows for each of the three years in the period ended December 31, 2019, and the related notes and financial statement schedule included under Item 15(a) (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019, in conformity with accounting principles generally accepted in the United States of America.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the Company's internal control over financial reporting as of December 31, 2019, based on criteria established in the 2013 Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO"), and our report dated February 27, 2020 expressed an unqualified opinion.

Change in accounting principle

As discussed in Note 2 to the consolidated financial statements, the Company has changed its method of accounting for leases in 2019 due to the adoption of Accounting Standards Update 2016-02, *Leases (Topic 842)*.

Basis for opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the 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 audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the 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 supporting the amounts and disclosures in the 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 financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ GRANT THORNTON LLP

We have served as the Company's auditor since 2006.

Arlington, Virginia
February 27, 2020

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Board of Directors and Stockholders
Spok Holdings, Inc.

Opinion on internal control over financial reporting

We have audited the internal control over financial reporting of Spok Holdings, Inc. (a Delaware corporation) and subsidiaries (the “Company”) as of December 31, 2019, based on criteria established in the 2013 Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (“COSO”). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2019, based on criteria established in the 2013 Internal Control-Integrated Framework issued by COSO.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (“PCAOB”), the consolidated financial statements of the Company as of and for the year ended December 31, 2019, and our report dated February 27, 2020 expressed an unqualified opinion on those financial statements.

Basis for opinion

The Company’s management is responsible 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 an opinion on the Company’s internal control over financial reporting based on our audit. We are a public accounting firm registered with the 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 audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

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 (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) 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 (3) 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.

/s/ GRANT THORNTON LLP

Arlington, Virginia
February 27, 2020

SPOK HOLDINGS, INC.
CONSOLIDATED BALANCE SHEETS

(Dollars in thousands, except share and per share amounts)	December 31, 2019	December 31, 2018
ASSETS		
Current assets:		
Cash and cash equivalents	$ 47,361	$ 83,343
Short-term investments	29,899	3,963
Accounts receivable, net	30,174	32,386
Prepaid expenses	7,517	6,906
Other current assets	1,710	2,672
Inventory, net	1,004	1,708
Total current assets	117,665	130,978
Non-current assets:		
Property and equipment, net	8,000	10,354
Operating lease right-of-use assets	16,317	—
Goodwill	124,182	133,031
Intangible assets, net	2,917	5,417
Deferred income tax assets, net	48,983	46,484
Other non-current assets	1,808	1,448
Total non-current assets	202,207	196,734
TOTAL ASSETS	$ 319,872	$ 327,712
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 3,615	$ 2,010
Accrued compensation and benefits	11,680	11,348
Accrued taxes	1,529	1,822
Deferred revenue	25,944	26,106
Operating lease liabilities	5,437	—
Other current liabilities	2,978	3,662
Total current liabilities	51,183	44,948
Non-current liabilities:		
Asset retirement obligations	6,061	6,513
Operating lease liabilities	11,575	—
Other non-current liabilities	959	1,697
Total non-current liabilities	18,595	8,210
TOTAL LIABILITIES	69,778	53,158
COMMITMENTS AND CONTINGENCIES (Note 10)		
STOCKHOLDERS' EQUITY:		
Preferred stock—$0.0001 par value; 25,000,000 shares authorized; no shares issued or outstanding	$ —	$ —
Common stock—$0.0001 par value; 75,000,000 shares authorized; 19,071,614 and 19,389,066 shares issued and outstanding as of December 31, 2019 and December 31, 2018, respectively	2	2
Additional paid-in capital	86,874	90,559
Accumulated other comprehensive loss	(1,601)	(1,301)
Retained earnings	164,819	185,294
TOTAL STOCKHOLDERS' EQUITY	250,094	274,554
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	$ 319,872	$ 327,712

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

SPOK HOLDINGS, INC.
CONSOLIDATED STATEMENTS OF OPERATIONS

(Dollars in thousands, except share and per share amounts)	For the Year Ended December 31, 2019	2018	2017
Revenue:			
Wireless	$ 88,167	$ 94,277	$ 101,188
Software	72,122	75,197	69,987
Total revenue	160,289	169,474	171,175
Operating expenses:			
Cost of revenue	30,072	32,408	28,418
Research and development	27,543	24,464	18,702
Technology operations	31,428	31,356	31,502
Selling and marketing	23,170	24,553	22,823
General and administrative	45,787	49,097	47,400
Depreciation, amortization and accretion	9,249	10,769	11,624
Goodwill impairment	8,849	—	—
Total operating expenses	176,098	172,647	160,469
Operating (loss) income	(15,809)	(3,173)	10,706
Interest income	1,651	1,638	719
Other income (expense)	735	(650)	134
(Loss) income before income tax benefit (expense)	(13,423)	(2,185)	11,559
Benefit from (provision for) income taxes	2,658	706	(26,865)
Net loss	$ (10,765)	$ (1,479)	$ (15,306)
Basic and diluted net (loss) income per common share	$ (0.56)	$ (0.08)	$ (0.76)
Basic and diluted weighted average common shares outstanding	19,089,402	19,667,891	20,210,260
Cash dividends declared per common share	$ 0.50	$ 0.50	$ 0.50

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

SPOK HOLDINGS, INC.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS

	For the Year Ended December 31,		
	2019	2018	2017
(Dollars in thousands)			
Net loss	$ (10,765)	$ (1,479)	$ (15,306)
Other comprehensive (loss) income, net of tax:			
Foreign currency translation adjustments	(300)	(49)	11
Other comprehensive (loss) income	(300)	(49)	11
Comprehensive loss	$ (11,065)	$ (1,528)	$ (15,295)

SPOK HOLDINGS, INC.
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

(Dollars in thousands, except share amounts)	Outstanding Common Shares	Common Stock	Additional Paid-In Capital & Accumulated Other Comprehensive Loss	Retained Earnings	Total Stockholders' Equity
Balance, January 1, 2017	20,525,614	$ 2	$ 104,810	$ 217,275	$ 322,087
Net income	—	—	—	(15,306)	(15,306)
Issuance of common stock under the Employee Stock Purchase Plan	17,760	—	256	—	256
Issuance of common stock for vested restricted stock units under the 2012 Equity Plan	143,394	—	—	—	—
Amortization of stock based compensation	—	—	3,688	—	3,688
Cash dividends declared	—	—	—	(10,332)	(10,332)
Common stock repurchase program	(572,550)	—	(10,023)	—	(10,023)
Issuance of restricted stock under the Equity Plan and other	21,296	—	(11)	159	148
Cumulative translation adjustment	—	$ —	$ 11	$ —	$ 11
Balance, December 31, 2017	20,135,514	$ 2	$ 98,731	$ 191,796	$ 290,529
Net loss	—	—	—	(1,479)	(1,479)
Adjustment to beginning balance due to adoption of ASC 606 and related tax impact	—	—	(166)	5,110	4,944
Issuance of common stock under the Employee Stock Purchase Plan	20,120	—	247	—	247
Issuance of common stock for vested restricted stock units under the 2012 Equity Plan	199,991	—	—	—	—
Purchase of common stock for tax withholding	(62,432)	—	(976)	—	(976)
Amortization of stock based compensation	—	—	4,954	—	4,954
Cash dividends declared	—	—	—	(10,133)	(10,133)
Common stock repurchase program including commissions	(929,116)	—	(13,483)	—	(13,483)
Issuance of restricted stock under the Equity Plan	24,989	—	—	—	—
Cumulative translation adjustment	—	—	(49)	—	(49)
Balance, December 31, 2018	19,389,066	$ 2	$ 89,258	$ 185,294	$ 274,554
Net loss	—	—	—	(10,765)	(10,765)
Issuance of common stock under the Employee Stock Purchase Plan	23,299	—	264	—	264
Issuance of common stock for vested restricted stock units under the 2012 Equity Plan	233,507	—	—	—	—
Purchase of common stock for tax withholding	(74,049)	—	(1,017)	—	(1,017)
Amortization of stock based compensation	—	—	3,643	—	3,643
Cash dividends declared	—	—	—	(9,864)	(9,864)
Common stock repurchase program including commissions	(532,354)	—	(6,575)	—	(6,575)
Issuance of restricted stock under the Equity Plan and other	32,145	—		154	154
Cumulative translation adjustment	—	—	(300)	—	(300)
Balance, December 31, 2019	19,071,614	$ 2	$ 85,273	$ 164,819	$ 250,094

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

SPOK HOLDINGS, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS

(Dollars in thousands)	For the Year Ended December 31, 2019	2018	2017
Cash flows from operating activities:			
Net loss	$ (10,765)	$ (1,479)	$ (15,306)
Adjustments to reconcile net (loss) income to net cash provided by operating activities:			
Depreciation, amortization and accretion	9,249	10,769	11,624
Goodwill impairment	8,849	—	—
Deferred income tax (benefit) expense	(3,253)	(1,692)	25,390
Stock based compensation	3,643	4,954	3,688
Provisions for doubtful accounts, service credits, adjustments of non-cash transaction taxes and other	694	1,922	222
Changes in assets and liabilities:			
Accounts receivable	964	(915)	(9,648)
Prepaid expenses and other assets	2,913	(646)	244
Accounts payable, accrued liabilities and other	(643)	(1,732)	(3,278)
Deferred revenue	42	(866)	2,579
Net cash provided by operating activities	11,693	10,315	15,515
Cash flows from investing activities:			
Purchases of property and equipment	(4,837)	(5,915)	(9,214)
Purchase of short-term investments	(59,385)	(3,911)	(3,957)
Maturity of short-term investments	34,000	4,000	4,000
Net cash used in investing activities	(30,222)	(5,826)	(9,171)
Cash flows from financing activities:			
Cash distributions to stockholders	(9,819)	(10,064)	(15,234)
Purchase of common stock (including commissions)	(6,575)	(13,483)	(10,023)
Proceeds from issuance of common stock under the Employee Stock Purchase Plan	258	247	256
Purchase of common stock for tax withholding on vested equity awards	(1,017)	(976)	—
Net cash used in financing activities	(17,153)	(24,276)	(25,001)
Effect of exchange rate on cash	(300)	(49)	11
Net decrease in cash and cash equivalents	(35,982)	(19,836)	(18,646)
Cash and cash equivalents, beginning of period	83,343	103,179	121,825
Cash and cash equivalents, end of period	$ 47,361	$ 83,343	$ 103,179
Supplemental disclosure:			
Income taxes paid	$ 901	$ 1,061	$ 2,620

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

SPOK HOLDINGS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

NOTE 1 - ORGANIZATION AND SIGNIFICANT ACCOUNTING POLICIES

Spok, Inc., a wholly owned subsidiary of Spok Holdings, Inc. (NASDAQ: SPOK) ("Spok" or the "Company"), is proud to be the global leader in healthcare communications. We deliver clinical information to care teams when and where it matters most to improve patient outcomes. Top hospitals rely on the Spok Care Connect platform to enhance workflows for clinicians, support administrative compliance, and provide a better experience for patients.

We offer a focused suite of unified clinical communication and collaboration solutions that include call center operations, clinical alerting and notifications, one-way and advanced two-way wireless messaging services, mobile communications and public safety solutions.

We provide one-way and advanced two-way wireless messaging services, including information services, throughout the United States. These services are offered on a local, regional and nationwide basis, employing digital networks. One-way messaging consists of numeric and alphanumeric messaging services. Numeric messaging services enable subscribers to receive messages that are composed entirely of numbers, such as a phone number, while alphanumeric messages may include numbers and letters, which enable subscribers to receive text messages. Two-way messaging services enable subscribers to send and receive messages to and from other wireless messaging devices, including pagers, personal digital assistants and personal computers. We also offer voice mail, personalized greetings, message storage and retrieval, and equipment loss and/or maintenance protection to both one-way and two-way messaging subscribers. These services are commonly referred to as wireless messaging and information services.

We also develop, sell and support enterprise-wide systems for hospitals and other organizations needing to automate, centralize and standardize mission clinical communications. These solutions are used for contact centers, clinical alerting and notification, mobile communications and messaging and for public safety notifications. These areas of market focus compliment the market focus of our wireless services outlined above.

Basis of Presentation

The accompanying Consolidated Financial Statements include our accounts and the accounts of our wholly owned direct and indirect subsidiaries. All significant intercompany accounts and transactions have been eliminated in consolidation. Our Consolidated Financial Statements have been prepared in accordance with accounting principles generally accepted in the United States (“GAAP”) and the rules and regulations of the United States Securities and Exchange Commission (the “SEC”). In management's opinion, the Consolidated Financial Statements include all adjustments and accruals that are necessary for the presentation of the results of all periods reported herein and all such adjustments are of a normal, recurring nature. As a result of the adoption of Accounting Standards Codification (“ASC”) 842, Leases, and our application of the modified retrospective approach using a cumulative effect adjustment to our opening balance of retained earnings as of January 1, 2019, prior period amounts have not been restated under ASC 842. For additional details refer to Note 2, "Recent and Pending Accounting Standards" and Note 4, "Leases."

Amounts shown on the consolidated statements of operations within the operating expense categories of cost of revenue; research and development; technology operations; selling and marketing; and general and administrative are recorded exclusive of depreciation, amortization and accretion. These items are shown separately on the consolidated statements of operations within operating expenses to the extent that they are considered material for the periods presented.

The Company adopted ASC 606 on January 1, 2018. Periods prior to January 1, 2018 reflect accounting under ASC 605, "Revenue Recognition" and have not been adjusted for the adoption of ASC 606.

Use of Estimates

The preparation of these consolidated financial statements requires management to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues, expenses and related disclosures. On an on-going basis, we evaluate estimates and assumptions, including but not limited to those related to the impairment of long-lived assets, intangible assets subject to amortization and goodwill, accounts receivable allowances, revenue recognition, depreciation expense, asset retirement obligations, and income taxes. We base our estimates on historical experience and various other assumptions that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

Revenue Recognition

The majority of our revenues are derived from short-term contracts related to the sale of wireless paging services and software solutions. Our arrangements exist primarily with customers in the healthcare market and to a lesser extent State and Federal governments, as well as large enterprise businesses.

Under the typical payment terms of our software contracts customers will normally pay a material amount of the contract price immediately upon execution of the contract. The remaining payments are required when product is delivered, when services begin and, to a lesser extent, when services are completed. Wireless services are generally billed as incurred on a monthly basis. Our contracts will generally result in billings in excess of revenue recognized, which we present as deferred revenues on the Consolidated Balance Sheets, primarily due to the receipt of payment in advance of product or services being provided. Amounts billed and due from our customers are classified as accounts receivable on the Consolidated Balance Sheets. At times, we may have contracts which require us to perform work or provide products prior to billing which will generally result in revenue recognized in excess of billings. This excess is presented as unbilled receivables in the Notes to the Consolidated Financial Statements. We generally do not have transactions that include a significant financing component (whether payments are made in advance or in arrears) as our contracts typically take less than 12 months to complete once started. We would not adjust the total consideration for the effects of a significant financing component if we anticipate, at contract inception, that the period between when we transfer a promised good or service to a customer and when the customer pays for that good or service will be one year or less.

We account for a contract when: (1) both parties have approved the contract through mutually signed agreements but at times may be done through other methods such as purchase orders or master agreements; (2) the rights of the parties have been identified; (3) payment terms have been identified; (4) the contract has commercial substance; and (5) collectability of consideration is probable. We also evaluate whether two or more contracts should be combined and accounted for as a single contract. In our evaluation, we consider criteria such as, but not limited to, whether: (1) the contracts are negotiated as a package with a single commercial objective; (2) the amount of consideration to be paid in one contract is dependent on the price or performance of another contract; and (3) some or all of the goods or services promised in the contracts are a single performance obligation. Should we consider contracts related, we would account for those contracts as if they were a single contract. Evaluating whether two or more contracts should be combined and accounted for as a single contract requires significant judgment. In the aggregate, a decision to combine a group of contracts could significantly impact the amount of revenue and profit recorded in a given period.

We review each contract to determine whether to account for the various promises as one or more performance obligations. The assessment and determination of performance obligations for a given contract requires significant judgment. Wireless service contracts are generally considered to be a single promise and therefore accounted for as a single performance obligation. Contracts which include goods or services related to our software solutions are generally sold with multiple promises and therefore will often include multiple performance obligations. Material performance obligations related to the sale of our software solutions include software licenses, professional services, hardware and maintenance, of which professional services and maintenance are generally considered a series of performance obligations.

More often than not, total consideration will equate to the stated value on the contract taking into consideration any period or term over which services are to be provided, if applicable. However, we could have contracts in which variable consideration is present. It is common for our contracts which include wireless services to contain customer penalties if rental pagers are not returned and fees for usage of services in excess of the contractually allotted amount for a given period. It is also common for our contracts that include professional services to include travel related costs. These are costs which we incur in the normal course of delivering professional services and are generally billable to the customer based on our incurred expenses. These elements of variable consideration are fully constrained when an agreement is initially executed and are generally not considered estimable until the penalties, fees or costs have been incurred or are otherwise known. We include estimated amounts in the transaction price to the extent it is probable that a significant reversal of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is resolved. Estimating variable consideration requires significant judgment and our assessment includes all relevant information that is reasonably available to us including historical, current and forecasted information. We have elected to exclude from revenue, all amounts collected on behalf of third parties, and therefore, items such as sales and use tax are excluded from our calculation of the total transaction price.

If a contract is separated into more than one performance obligation we allocate the total transaction price to each performance obligation proportionately based on the estimated relative standalone selling price ("SSP") of the promised goods or services underlying each performance obligation. We rarely sell goods or services with readily observable standalone sales, however, if we do, the observable standalone sales are used to determine the SSP. In most cases, we must estimate the relative SSP which requires significant judgment and estimates. In instances where SSP is not directly observable we determine the SSP using information that may include contractually stated prices, market conditions, costs, renewal contracts, list prices and other observable inputs. A discount is present if the total transaction price is less than the sum of the estimated SSPs of the goods or services promised in the contract. Discounts are generally allocated proportionately based on the relative SSP of the identified performance obligations for a given contract.

Our wireless, professional and maintenance services are generally recognized over time due to a customer's simultaneous receipt and consumption of the benefit as we perform the work. As we transfer control over time, we recognize revenue based on the extent of progress towards completion of the performance obligation. The selection of the method to measure progress towards completion requires significant judgment and is based on the nature of the products or services to be provided. Generally, we use the time-elapsed measure of progress for performance obligations which include wireless or maintenance services. We believe this method best depicts the simultaneous transfer and consumption of the benefit based on our performance as these services are generally considered standby services. For professional services, we leverage an input methodology based on the number of hours worked on a project versus the total expected hours necessary to complete the project. Revenues are recognized proportionally as hours are incurred. This is a significant area of judgment as it requires an estimate at completion ("EAC") for each contract. Our initial EAC is primarily based on prior experience also taking into consideration any specific facts and circumstances for a given contract. As projects progress, the EAC is periodically updated and reviewed to ensure the timing of revenue recognition is appropriate. The creation, maintenance and review of a project's EAC requires significant judgment to determine an appropriate number of hours over which the remaining project is expected to be completed.

Our software licenses and hardware are generally recognized at a point in time when we have transferred control to the customer. For software licenses, revenue is not recognized until the related license(s) has been made available to the customer and the customer can begin to benefit from its right to use the license(s). Our software licenses represent a right to use Spok's Intellectual Property ("IP") as it exists at a point in time at which the license is granted. Many of our software licenses have significant standalone functionality due to their ability to process a transaction or perform a function or task, and we do not need to maintain those products, once provided to the customer, for value to exist. While the functionality of IP that we license may substantively change during the license period, customers are not contractually or practically required to update their license as a result of those changes. Assessing when transfer of control has occurred requires significant judgment. In most contracts transfer of control for software licenses occurs in a short period of time after a contract has been executed and licenses are made electronically available.

Contracts may be modified to account for changes in a project's scope or other customer requirements. Most of our contract modifications are for goods or services that are distinct from the existing contract. In these instances, the contract modification would either be recognized as an entirely new and separate contract or the modification would be treated as if it were a termination of the existing contract and the creation of a new contract including all undelivered goods and services under the previous contract. Revenue would be recognized on a prospective basis and a cumulative catch-up would not be recognized.

Incremental Costs of Obtaining a Contract and Costs to Fulfill a Contract

Our incremental costs primarily relate to sales commissions. We capitalize commissions and proportionally recognize the related expense to revenue as it is recognized on the underlying performance obligations. Some of these costs may relate to specific future anticipated contracts, specifically future maintenance renewals, which we do not pay commensurate sales commissions on. We amortize commission costs proportionally with revenue, thus it is necessary for us to estimate future revenues when there are future anticipated contracts. We estimate future revenues based on anticipated renewal amounts over an expected useful life (e.g. the period over which we believe the initial sales commissions relate to future anticipated contracts). The expected useful life is based on a review of our product life cycles, customer upgrade patterns and the rate at which customers renew maintenance. Commission expense was $5.0 million, $6.2 million and $5.2 million for the years ended December 31, 2019, 2018 and 2017, respectively. Commission expense is classified within the selling and marketing operating expenses category.

Leases

Operating lease right-of-use ("ROU") assets and liabilities are recognized at the commencement date based on the present value of lease payments over the lease term. We have made an accounting policy election not to apply the recognition requirements of ASC 842 to short-term leases. Those leases which have a term of less than 12 months will have lease payments recognized, in our Condensed Consolidated Statement of Operations, on a straight-line basis over the lease term. An optional renewal or termination is not recognized as part of the lease term unless we determine that it is reasonably certain that we will exercise that option. The term reasonably certain is a high threshold for which pervasive evidence generally does not exist, and therefore, optional renewal periods are generally excluded from our ROU assets and lease liabilities until they have been exercised. Lease expense is recognized on a straight-line basis over the lease term.

As most of our leases do not provide an implicit rate, we use an estimated incremental borrowing rate in determining the present value of lease payments. The Company uses a portfolio approach when determining the discount rate to be applied to its leases. Significant judgment is necessary when determining a discount rate because we must estimate the discount rate based on a number of factors and observable inputs including current market conditions, market yields, government bonds, credit risk, and other factors as necessary. The Company must also exercise significant judgment when determining whether an option to renew or terminate a lease should be included in the lease term. This judgment includes an assessment of all relevant economic factors such as costs relating to the termination or extension of a lease, importance of the underlying asset to the Company's operations, and the terms and conditions of the optional periods in relation to current market rates.

Where we have lease agreements which contain lease and non-lease components, we have elected to make use of the practical expedient to account for each separate lease component and associated non-lease component as a single lease component.

Impairment of Long-Lived Assets, Intangible Assets Subject to Amortization and Goodwill

We are required to evaluate the carrying value of our long-lived assets, amortizable intangible assets and goodwill. Amortizable intangible assets include customer-related intangibles that resulted from previous acquisitions. Such intangibles are amortized over periods up to ten years. Quarterly, we assess whether circumstances exist which suggest that the carrying value of long-lived and amortizable intangible assets may not be recoverable. When applicable, we assess the recoverability of the carrying value of our long-lived assets and certain amortizable intangible assets based on estimated undiscounted cash flows to be generated from such assets. In assessing the recoverability of these assets, we forecast estimated enterprise-level cash flows based on various operating assumptions such as revenue forecasted by product line and in-process research and development cost. If the forecast of undiscounted cash flows does not exceed the carrying value of the long-lived and amortizable intangible assets, we record an impairment charge to the extent the carrying value exceeded the fair value of such assets.

Goodwill is not amortized but is evaluated for impairment at least annually, or when events or circumstances suggest a potential impairment has occurred. We generally perform this annual impairment test in the fourth quarter of the fiscal year. We evaluate goodwill for impairment between annual tests if indicators of impairment exist. The impairment test involves comparing the fair value of the reporting unit with its carrying value. An impairment charge is recognized for the amount that the carrying value exceeds the reporting unit's fair value. For purposes of the goodwill impairment evaluation, the Company as a whole is considered the reporting unit. The fair value of the reporting unit is estimated under a market based approach using the fair value of the Company's common stock. The estimated fair value requires significant judgments, including timing and appropriateness of the price of common stock used (e.g. point-in-time application, simple moving average, exponential moving average), as well as application of an estimated control premium. The estimated control premium is based on a review of current and past market information published by a third-party resource.

Based on our assessment during the fourth quarter of 2019, the estimated fair value exceeded the carrying value of the reporting unit and, therefore, an impairment existed. For additional details refer to Note 6, "Goodwill and Intangible Assets, Net."

We did not record any impairment of long-lived assets or definite-lived intangible assets for the years ended December 31, 2019, 2018 and 2017.

Accounts Receivable Allowances

Our two most significant allowance accounts are: an allowance for doubtful accounts and an allowance for service credits. Provisions for these allowances are recorded on a monthly basis and are included as a component of general and administrative expenses, respectively.

Estimates are used in determining the allowance for doubtful accounts and are based on historical collection experience and current and forecasted trends, as well as known specific collection risks. In determining these estimates, we review historical write-offs, including comparisons of write-offs to provisions for doubtful accounts. We compare the ratio of the allowance to gross receivables to historical levels, and monitor amounts collected and related statistics. We write off receivables when they are deemed uncollectible. While write-offs of customer accounts have historically been within our expectations and the provisions established, we cannot guarantee that the future write-off experience will be consistent with historical experience, which could result in material differences when compared to the allowance for doubtful accounts and related provisions.

From time to time, we grant service credits for customer retention purposes or when there is an adjustment in the scope of work. The allowance for service credits related provisions are based on historical credit percentages, current credit and aging trends, historical actual payment trends and actual credit experience. We analyze our past credit experience over several time frames. Using this analysis along with current operational data, including existing experience of credits issued and the time frames in which credits are issued, we establish an appropriate allowance for service credits. This allowance also reduces accounts receivable for lost and non-returned pagers to the expected realizable amounts and for free wireless services. While credits issued have been within our expectations and the provisions established, we cannot guarantee that future credit experience will be consistent with historical experience, which could result in material differences when compared to the allowance for service credits and maintenance related provisions.

Inventory

Inventories are stated at the lower of cost or net realizable value. Cost is computed using a weighted average cost approach which averages the prices at which goods are purchased from vendors. We evaluate our ending inventories for shrinkage and estimated obsolescence. Any shrinkage identified is written off to cost of goods sold in the period in which the shrinkage is identified. Further, we assess the impact of changing technology on our inventories and we write off inventories that are considered obsolete in the period in which the analysis takes place. Inventory consists primarily of finished goods. We do not account for inventory as work-in-process or raw materials as any such inventory would be immaterial to the consolidated financial statements.

Property and Equipment

Property and equipment are reported at cost and are depreciated using the straight-line method based on estimated useful lives which range from one to five years.

Transmitter assets are grouped into tranches based on our transmitter decommissioning forecast and are depreciated using the group life method on a straight-line basis. Depreciation expense is determined by the expected useful life of each tranche of the underlying transmitter assets. The expected useful life is based on our forecasted usage of those assets and their retirement over time and aligns the useful lives of these transmitter assets with their planned removal from service. Disposals are charged against accumulated depreciation with no gain or loss recognized. This rational and systematic method matches the underlying usage of these assets to the underlying revenue that is generated from these assets. Depreciation expense for these assets is subject to change based upon revisions in the timing of transmitter deconstruction resulting from our long-range planning and network rationalization process.

Asset Retirement Obligations

We recognize liabilities and corresponding assets for future obligations associated with the retirement of assets. We have paging equipment assets, principally transmitters, which are located on leased locations. The underlying leases generally require the removal of equipment at the end of the lease term; therefore, a future obligation exists. Asset retirement costs are reflected in paging equipment assets with depreciation expense recognized over the estimated lives, which range between one and five years. The asset retirement costs and the corresponding liabilities that have been recorded to date generally relate to either current plans to consolidate networks or to the removal of assets at a future terminal date. When an asset retirement obligation arises, the liabilities and corresponding assets are recorded at their present value using a discounted cash flow approach and the liabilities are accreted using the interest method.

The recognition of an asset retirement obligation requires that management make numerous assumptions regarding such factors as the cost and timing of deconstruction; the credit-adjusted risk-free rate to be used; inflation rates; and future advances in technology. The fair value estimate of contractor fees to remove each asset is assumed to escalate by 2% each year through the terminal date. The total estimated liability is based on the estimated future value of those costs and the timing of deconstruction.

We believe these estimates are reasonable at the present time, but we can give no assurance that changes in technology, our financial condition, the economy or other factors would not result in higher or lower asset retirement obligations. Any variations from our estimates would generally result in a change in the assets and liabilities in equal amounts, and operating results would differ in the future by any difference in depreciation expense and accretion expense (see Note 5, "Consolidated Financial Statement Components", and Note 7, "Asset Retirement Obligations", for additional details).

Income Taxes

We file a consolidated U.S. Federal income tax return and income tax returns in state, local and foreign jurisdictions as required. The provision for current income taxes is calculated and accrued on income and expenses expected to be included in current year U.S. and foreign income tax returns. The provision for current income taxes may also include interest, penalties and an estimated amount reflecting uncertain tax positions.

Deferred income tax assets and liabilities are computed based on temporary differences between the financial statement values and the tax bases of assets and liabilities including net operating loss and tax credit carryforwards at the enacted tax rates expected to apply to taxable income when taxes are actually paid or recovered. Changes in deferred income tax assets and liabilities are included as a component of deferred income tax expense. Deferred income tax assets represent amounts available to reduce future income taxes payable. We provide a valuation allowance when we consider it “more likely than not” (greater than a 50% probability) that a deferred income tax asset will not be fully recovered. Our valuation allowance assessment includes an evaluation of our history of generating taxable income and estimates of future taxable income, including when applicable the use of appropriate tax planning strategies.

Assets and liabilities are established for uncertain tax positions taken or positions expected to be taken in income tax returns when such positions fail to meet the “more likely than not” threshold based on the technical merits of the positions. We assess whether previously unrecognized tax benefits may be recognized when the tax position is (1) more likely than not of being sustained based on its technical merits, (2) effectively settled through examination, negotiation or litigation, or (3) settled through actual expiration of the relevant tax statutes We had no uncertain tax positions for the periods ended December 31, 2019 and 2018. (see Note 9, "Income Taxes," for additional details).

Research and Development

In accordance with ASC 985-20, *Software to be Sold, Leased, or Marketed*, certain software development costs are charged to operations and expensed as incurred until technological feasibility has been established. Material costs incurred after technological feasibility is established and before the product is ready for general release are capitalized and amortized on a straight-line basis over the estimated remaining economic life of the product or the ratio of current revenues to total projected product revenues, whichever is greater. To date, the time between technological feasibility and general release to the public has been extremely short and consequently expenses available for capitalization have been immaterial. Accordingly, all research and developments costs incurred to date, accounted for in accordance with ASC 985-20, have been expensed as incurred.

In accordance with ASC 350-40, *Internal-use Software*, certain software development costs are capitalized while in the application development stage related to software developed for internal use or software sold in a SaaS arrangement. This includes certain development costs for Spok Go. All other costs incurred during the preliminary project stage or the post implementation stage, are expensed as incurred. To date, we have not incurred material costs that would qualify for capitalization. We anticipate certain costs will begin to qualify for capitalization beginning in early 2020 and these costs are likely to be material.

Shipping and Handling Costs

We incur shipping and handling costs to send and receive messaging devices and other equipment to/from our customers. Amounts billed to customers related to shipping and handling are classified as revenue and the Company's shipping and handling costs are classified as cost of revenue. These costs are expensed as incurred.

Advertising Expenses

Advertising costs are charged to operations when incurred. Advertising costs are classified as selling and marketing expenses. Advertising expenses were $1.7 million, $2.4 million and $2.3 million for the years ended December 31, 2019, 2018, and 2017, respectively.

Stock Based Compensation

We account for share-based payments to employees, including restricted stock units ("RSUs"), restricted common stock ("restricted stock") and the option to purchase common stock under the Employee Stock Purchase Plan ("ESPP") based on their fair value and the estimated number of shares we expect will vest based on the performance metrics associated with the award, if applicable. Fair value is measured based on the closing fair market value of the Company's common stock on the date of grant. Compensation expense is recognized on a straight-line basis over the requisite service period. Forfeitures and withdrawals are accounted for on an as incurred basis.

Changes in our estimates of the expected attainment of performance targets are reflected in the amount of compensation expense that we recognize for the related instruments during the interim reporting period when the change in estimate is determined and may cause the amount of compensation expense that we record for each period to vary. Further information regarding stock based compensation can be found in Note 8, "Stockholders' Equity."

Concentration of Credit Risk

Our financial instruments that are potentially subject to concentrations of credit risk consist primarily of cash, cash equivalents, short-term receivables and accounts receivable. While our cash and cash equivalents are managed by reputable financial institutions, deposits at these institutions and funds may, at times, exceed federally insured limits. Management believes that these financial institutions and funds are financially sound and, accordingly, that minimal credit risk exists.

Accounts receivable are typically unsecured and are derived from revenue earned from customers across different geographic locations, primarily within the U.S. We perform ongoing credit evaluations of our customers, and generally do not require collateral. We maintain an allowance for estimated credit losses. During the years ended December 31, 2019, 2018, and 2017, our bad debt expenses were $0.7 million, $1.6 million, and $0.5 million, respectively. In the event that accounts receivable collection cycles deteriorate, our operating results and financial position could be adversely affected. No customer represented 10% or more of total revenue or accounts receivable during the years ended December 31, 2019, 2018, and 2017.

Sales and Use Taxes

Sales and use taxes imposed on the ultimate consumer are excluded from revenue where we are required by law or regulation to act as collection agent for the taxing jurisdiction.

Fair Value Measurements and Financial Instruments

We account for certain assets and liabilities at fair value. We categorize each of our fair value measurements in one of the following three levels based on the lowest level input that is significant to the fair value measurement in its entirety. These levels are:

Level 1 - Inputs are based upon unadjusted quoted prices for identical instruments in active markets.

Level 2 - Inputs are based upon quoted prices for similar instruments in active markets, quoted prices for identical or similar instruments in markets that are not active, inputs other than quoted prices that are observable for the asset or liability and inputs that are corroborated by other observable market data.

Level 3 - Unobservable inputs that cannot be corroborated by observable market data and typically reflect management's estimates of assumptions that market participants would use in pricing the asset or liability.

We consider all highly liquid interest-earning investments with a maturity of three months or less at the date of purchase to be cash equivalents. Those investments with an original maturity of greater than three months and less than one year are classified as short-term investments. Cash and cash equivalents consist primarily of cash on deposit with banks and investments in money market funds.

Our short-term investments consist entirely of U.S. Treasury securities which are classified as held-to-maturity and are measured at amortized cost on our Consolidated Balance Sheets. These investments are classified as Level 1 and mature within 12 months. The differences between carrying value and fair value are not material to the Consolidated Financial Statements.

Financial instruments including cash and cash equivalents, accounts receivable and accounts payable all have fair values that approximate their carrying values at December 31, 2019 and 2018 due to their short maturities.

Earnings Per Common Share

The calculation of earnings per common share is based on the weighted-average number of common shares outstanding during the applicable period. The calculation for diluted earnings per common share recognizes the effect of all potential dilutive common shares that were outstanding during the respective periods, unless the impact would be anti-dilutive. Further information regarding earnings per common share can be found in Note 8, "Stockholders' Equity."

NOTE 2 - RECENT AND PENDING ACCOUNTING STANDARDS

Recently Adopted

Leases - ASC 842 "Leases"

On January 1, 2019, we adopted ASC 842 using the modified retrospective approach that resulted in a material adjustment to our balance sheet as of January 1, 2019. During the quarter ended June 30, 2019, we adjusted our opening balance to record the effect of adopting ASC 842 by approximately $0.4 million. As a result, the impact of the adoption of ASC 842 was an increase to assets and liabilities of approximately $17.8 million. Results for reporting periods beginning after January 1, 2019 are presented under ASC 842, while prior period amounts are not adjusted and continue to be reported in accordance with our historic accounting under ASC 840. In the adoption of ASC 842, we elected to use the package of available practical expedients with the exception of hindsight. For additional details refer to Note 1, "Significant Accounting Policies Update" and Note 4 "Leases."

Pending Adoption

In June 2016, the FASB issued ASU No. 2016-13, *Financial Instruments-Credit Losses on Financial Instruments* ("CECL") that requires early recognition of credit losses on financial assets held at the reporting date based on historical experience, current conditions, and reasonable and supportable forecasts. This guidance is effective for fiscal years beginning after December 15, 2019. While our assessment is on-going, we do not believe the impact will have a material effect on our consolidated financial statements.

NOTE 3 - REVENUE, DEFERRED REVENUE AND PREPAID COMMISSIONS

Wireless Revenue

Wireless revenue consists of two primary components: paging revenue and product and other revenue. Paging revenue consists primarily of recurring fees associated with the provision of messaging services and fees for paging devices and is net of a provision for service credits. Product and other revenue reflects system sales, the sale of devices and charges for paging devices that are not returned and are net of anticipated credits. Our core offering includes subscriptions to one-way or two-way messaging services for a periodic (monthly, quarterly, semiannual, or annual) service fee. This is generally based upon the type of service provided, the geographic area covered, the number of devices provided to the customer and the period of commitment. A subscriber to one-way messaging services may select coverage on a local, regional or nationwide basis to best meet their messaging needs. Two-way messaging is generally offered on a nationwide basis. In addition, subscribers either contract for a messaging device from us for an additional fixed monthly fee or they own a device, having purchased it either from us or from another vendor. We also sell devices to resellers who lease or resell devices to their subscribers and then sell messaging services utilizing our networks. We offer ancillary services, such as voicemail and equipment loss or maintenance protection, which help increase the monthly recurring revenue we receive along with these traditional messaging services. We offer exclusive one-way (T5) and two-way (T52) alphanumeric pagers, which are configurable to support un-encrypted or encrypted operation. When configured for encryption, they utilize AES-128 bit encryption, screen locking and remote wipe capabilities. With encryption enabled these new secure paging devices enhance our service offerings to the healthcare community by adding Health Insurance Portability and Accountability Act ("HIPAA") security capabilities to the low cost, highly reliable and availability benefits of paging. (see Item 1. “Business,” for more details).

Software Revenue

Software revenue consists of two primary components: operations revenue and maintenance revenue. Operations revenue consists primarily of license revenues for our healthcare communications solutions, equipment revenues that facilitate the use of our software solutions, and professional services revenue related to the implementation of our solutions. Maintenance revenue is for ongoing support of our software solutions or related equipment (typically for one year) and access to when-and-if available software updates. Our software licenses and hardware are generally recognized at a point in time when we have transferred control to the customer. For software licenses, revenue is not recognized until the related license(s) has been made available to the customer and the customer can begin to benefit from its right to use the license(s). Our software licenses represent a right to use Spok’s IP as it exists at a point in time at which the license is granted. Many of our software licenses have significant standalone functionality due to their ability to process a transaction or perform a function or task, and we do not need to maintain those products, once provided to the customer, for value to exist. While the functionality of IP that we license may substantively change during the license period, customers are not contractually or practically required to update their license as a result of those changes. Our paging, professional and maintenance services are generally recognized over time due to a customer's simultaneous receipt and consumption of the benefit as we perform the work. As we transfer control over time, we recognize revenue based on the extent of progress towards completion of the performance obligation. The selection of the method to measure progress towards completion requires significant judgment and is based on the nature of the products or services to be provided. Generally, we use the time-elapsed measure of progress for performance obligations which include wireless or maintenance services. We believe this method best depicts the simultaneous transfer and consumption of the benefit based on our performance as these services are generally considered standby services. For professional services, we leverage an input methodology based on the number of hours worked on a project versus the total expected hours necessary to complete the project. Revenues are recognized proportionally as hours are incurred.

Revenue Recognition

Revenues are recognized when control of the promised goods or services is transferred to our customers, in an amount that reflects the consideration we expect to be entitled to in exchange for those goods or services. The Company adopted ASC 606 on January 1, 2018. Periods prior to January 1, 2018 reflect accounting under ASC 605, "Revenue Recognition" and have not been adjusted for the adoption of ASC 606.

The following table presents our revenues disaggregated by revenue type:

	For the Twelve Months Ended December 31,		
(Dollars in thousands)	**2019**	**2018**	**2017**
Revenue - wireless			
Paging revenue	85,067	90,570	97,296
Product and other revenue	3,100	3,707	3,892
Total wireless revenue	88,167	94,277	101,188
Revenue - software			
License	8,950	13,042	9,541
Services	19,189	18,091	17,630
Equipment	3,618	4,995	4,147
Operations revenue	$ 31,757	$ 36,128	$ 31,318
Maintenance revenue	$ 40,365	$ 39,069	$ 38,669
Total software revenue	$ 72,122	$ 75,197	$ 69,987
Total revenue	$ 160,289	$ 169,474	$ 171,175

The Company is currently structured as a single operating (and reportable) segment, a clinical communication and collaboration business. The U.S. was the only country that accounted for more than 10% of the Company's total revenue for the years ended December 31, 2019, 2018 and 2017. Revenue generated in the U.S. and internationally consisted of the following for the periods stated:

	For the Twelve Months Ended December 31,		
(Dollars in thousands)	**2019**	**2018**	**2017**
Revenue			
United States	$ 154,766	$ 164,558	$ 166,790
International	5,523	4,916	4,385
Total revenue	$ 160,289	$ 169,474	$ 171,175

Deferred Revenues

Our deferred revenues represent payments made to, or due from, customers in advance of our performance. Changes in the balance of total deferred revenue during the twelve months ended December 31, 2019 are as follows:

(Dollars in thousands)	**December 31, 2018**	**Additions**	**Revenue Recognized**	**December 31, 2019**
Deferred Revenue	$ 26,582	$ 70,684	$ (70,645)	$ 26,621

During the twelve months ended December 31, 2019, the Company recognized $25.3 million of revenue related to amounts deferred as of December 31, 2018.

Prepaid Commissions

Our prepaid commissions represent payments made to employees in advance of our performance on the related underlying contracts. These costs have been incurred directly in relation to obtaining a contract. As such, these costs are amortized over the estimated period of benefit. Changes in the balance of total prepaid commissions during the twelve months ended December 31, 2019 are as follows:

(Dollars in thousands)	**December 31, 2018**	**Additions**	**Commissions Recognized**	**December 31, 2019**
Prepaid Commissions	$ 2,394	$ 5,031	$ (4,994)	$ 2,431

Prepaid commissions are included within prepaid expenses on the Consolidated Balance Sheets and commissions expense is included within Selling and marketing on the Consolidated Statement of Operations.

Remaining Performance Obligations

The balance of remaining performance obligations at December 31, 2019 was $50.6 million. We expect to recognize approximately $36.5 million of these remaining performance obligations over the next 12 months, with the remaining balance recognized thereafter.

NOTE 4 - Leases

We have operating lease arrangements for corporate offices, cellular towers, storage units and small building spaces. The building space is used to house infrastructure, such as transmitters, antennae and other various equipment for the Company’s wireless paging services. For leases with a term of 12 months or less, renewal terms are generally of an evergreen nature (either month-to-month or year-to-year). For leases with a term greater than 12 months, renewal terms are generally explicit and provide for one to five optional renewals consistent with the initial term. Many of our leases, with the exception of those for our corporate offices, include options to terminate the lease within one year. Variable lease payments, residual value guarantees or purchase options are not generally present in these leases.

Lease costs are included in Technology Operations and General and Administrative expenses on the Consolidated Statement of Operations. The following table presents lease costs disaggregated by type:

	For the Year Ended December 31,
(Dollars in thousands)	**2019**
Operating lease cost	$ 5,823
Short-term lease cost	8,281
Short-term lease cost - related party[(1)]	3,589
Total lease cost	$ 17,693

Supplemental Disclosure:	
Cash paid for amounts included in the measurement of lease liabilities - operating leases	$ 1,421
Weighted-average remaining lease term - operating leases	5.60 years
Weighted-average discount rate - operating leases	5.45%

(1) A member of our Board of Directors also serves as a director for an entity that leases transmission tower sites to the Company. Refer to Note 12, "Related Parties" for additional details.

Maturities of lease liabilities as of December 31, 2019 were as follows:

For the Year Ended December 31,		(Dollars in thousands)
2020		5,447
2021		4,398
2022		2,765
2023		1,860
2024		1,409
Thereafter		3,824
Total future lease payments		19,703
Imputed interest		(2,691)
Total	$	17,012

NOTE 5 - CONSOLIDATED FINANCIAL STATEMENTS' COMPONENTS

Depreciation, Amortization and Accretion

Depreciation, amortization and accretion consisted of the following for the periods stated:

	For the Year Ended December 31,					
(Dollars in thousands)		2019		2018		2017
Depreciation						
Leasehold improvements	$	63	$	232	$	234
Asset retirement costs		(766)		(300)		(388)
Paging and computer equipment		6,526		7,397		8,024
Furniture, fixtures and vehicles		374		398		306
Total depreciation		6,197		7,727		8,176
Amortization		2,500		2,500		2,886
Accretion		552		542		562
Total depreciation, amortization and accretion expense	$	9,249	$	10,769	$	11,624

Accounts Receivable, net

Accounts receivable was recorded net of an allowance of $1.3 million and $1.7 million for the years ended December 31, 2019 and 2018, respectively. Accounts receivable, net includes $6.4 million and $8.7 million of unbilled receivables for the years ended December 31, 2019 and 2018, respectively. Unbilled receivables are defined as the Company's right to consideration in exchange for goods or services that we have transferred to the customer but have not yet billed for, generally as a result of contractual billing terms. The decrease in unbilled receivables was primarily due to an increase in billings for the year ended December 31, 2019.

Property and Equipment, net

Property and equipment, net consisted of the following for the periods stated:

		For the Year Ended December 31,			
(Dollars in thousands)	Useful Life (In Years)		2019		2018
Leasehold improvements	lease term	$	3,620	$	4,139
Asset retirement costs	1-5		1,922		2,021
Paging and computer equipment	1-5		96,562		98,401
Furniture, fixtures and vehicles	3-5		3,716		4,353
Total property and equipment			105,820		108,914
Accumulated depreciation			(97,820)		(98,560)
Total property and equipment, net		$	8,000	$	10,354

For purposes of assessing our asset retirement costs, we completed a review of the estimated useful life of our transmitter assets during the fourth quarter of 2019 (that are part of paging and computer equipment). This review was based on the results of our long-range planning and network rationalization process and indicated that the expected useful life of the last tranche of the transmitter assets was no longer appropriate. As a result of that review, the expected useful life of the final tranche of transmitter assets was extended from 2023 to 2024. This change resulted in a revision of the expected future depreciation expense for the transmitter assets and an immaterial impact to the consolidated financial statements beginning in 2020. We believe these estimates remain reasonable at the present time, but we can give no assurance that changes in technology, customer usage patterns, our financial condition, the economy or other factors would not result in changes to our transmitter decommissioning plans. Any further variations from our estimates could result in a change in the expected useful lives of the underlying transmitter assets and operating results could differ in the future by any difference in depreciation expense. The extension of the depreciable life was accounted for as a change in accounting estimate.

NOTE 6 - GOODWILL AND INTANGIBLE ASSETS, NET

Goodwill

During the quarter ended December 31, 2019, we performed our annual assessment of goodwill. Based on our assessment, using data as of October 31, 2019, the carrying value of the reporting unit exceeded the estimated fair value of the Company which indicated an impairment existed. For purposes of the goodwill impairment assessment, the Company as a whole is considered the reporting unit. The fair value of the reporting unit is estimated under a market based approach using the fair value of the Company's common stock. The estimated fair value requires significant judgments, including timing and appropriateness of the price of common stock used (e.g., point-in-time application, simple moving average, exponential moving average), as well as application of an estimated control premium. The estimated control premium is based on a review of current and past market information published by a third-party resource. While a formal impairment assessment is performed annually, the Company monitors its business environment for potential triggering events on a quarterly basis. There is potential for further impairment charges being recognized in future periods based on these ongoing assessments. The change in goodwill for the year ended December 31, 2019 was as follows:

(Dollars in thousands)	(Dollars in thousands)
Goodwill at January 1, 2019	$ 133,031
Impairment	(8,849)
Goodwill at December 31, 2019	$ 124,182

Intangible Assets

Amortizable intangible assets at December 31, 2019 and 2018 related primarily to customer relationships. Such intangible assets are being amortized over a period of ten years. We have not recorded an impairment of our intangible assets during the years ended December 31, 2019, 2018 and 2017.

The net consolidated balance of intangible assets consisted of the following at December 31, 2019 and 2018:

		As of December 31,					
		2019			2018		
(Dollars in thousands)	Useful Life (In Years)	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Customer relationships	10	$ 25,002	$ (22,085)	$ 2,917	$ 25,002	$ (19,585)	$ 5,417

Estimated amortization of intangible assets for future periods was as follows:

For the year ending December 31,	(Dollars in thousands)
2020	2,500
2021	417
Total	$ 2,917

NOTE 7 - ASSET RETIREMENT OBLIGATIONS

The components of the changes in the asset retirement obligation liabilities for the periods stated were as follows:

(Dollars in thousands)	Short-Term Portion	Long-Term Portion	Total
Balance at January 1, 2018	$ 234	$ 7,174	$ 7,408
Accretion	(91)	633	542
Amounts paid	(154)	—	(154)
Additions	—	55	55
Reductions	(185)	(1,119)	(1,304)
Reclassifications	230	(230)	—
Balance at December 31, 2018	34	6,513	6,547
Accretion	39	513	552
Amounts paid	(177)	—	(177)
Additions	—	32	32
Reductions	14	(817)	(803)
Reclassifications	180	(180)	—
Balance at December 31, 2019	$ 90	$ 6,061	$ 6,151

Increases and reductions other than accretion, reclassification and amounts paid primarily relate to changes in estimates of the underlying liability, specifically as it relates to updates in estimated costs to remove a transmitter and the estimated timing of removal. The cost associated with the estimated removal costs and timing refinements due to ongoing network rationalization activities is expected to accrete to a total liability of $7.6 million.

Additional information regarding asset retirement costs and accretion expense can be found in Note 5, "Consolidated Financial Statements' Components."

NOTE 8 - STOCKHOLDERS' EQUITY

General

Our authorized capital stock consists of 75 million shares of common stock, par value $0.0001 per share, and 25 million shares of preferred stock, par value $0.0001 per share.

At December 31, 2019 and 2018, we had no stock options outstanding.

At December 31, 2019 and 2018, there were 19,071,614 and 19,389,066 shares of common stock outstanding, respectively, and no shares of preferred stock outstanding.

Dividends

For each of the three years ending December 31, 2019, 2018 and 2017 our Board of Directors declared cash dividends of $0.50 per share of our outstanding common stock. An immaterial amount of dividends declared were related to unvested RSUs and unvested shares of restricted stock, which are accrued for and paid when the applicable vesting conditions are met. Accrued cash dividends on forfeited RSUs and restricted stock are also forfeited. Cash dividends paid as disclosed in the statements of cash flows for the years ended December 31, 2019, 2018 and 2017 included previously declared cash dividends on vested RSUs and on shares of vested restricted stock issued to non-executive members of our Board of Directors.

On February 26, 2020, our Board of Directors declared a regular quarterly cash dividend of $0.125 per share of common stock, with a record date of March 16, 2020, and a payment date of March 30, 2020. This cash dividend of approximately $2.4 million is expected to be paid from available cash on hand.

Common Stock Repurchase Program

On July 31, 2008, our Board of Directors approved a program to repurchase our common stock in the open market. This program has been extended at various times. In August 2018, the Company's Board of Directors authorized the repurchase of up to $10.0 million of the Company's common stock through December 31, 2018 on the open market or in privately negotiated transactions. In November 2018, the Company's Board of Directors extended the repurchase authority through December 31, 2019. The Company fully exhausted the repurchase authority in September 2019.

We use available cash on hand and net cash provided by operating activities to fund the common stock repurchase program. This repurchase authority allows us, at management’s discretion, to selectively repurchase shares of our common stock from time to time in the open market depending upon market price and other factors.

Repurchased shares of our common stock were accounted for as a reduction to common stock and additional paid-in-capital in the period in which the repurchase occurred. All repurchased shares of common stock are returned to the status of authorized, but unissued, shares of the Company.

Common stock purchased in 2019, 2018 and 2017 (excluding commission and the purchase of common stock for tax withholdings) was as follows:

For the Three Months Ended	**Shares Purchased**	**Amount**	**Shares Purchased**	**Amount**	**Shares Purchased**	**Amount**
(dollars in thousands, except for shares purchased)	**2019**		**2018**		**2017**	
March 31,	131,012	$ 1,806	127,792	$ 1,922	—	$ —
June 30,	—	—	501,782	7,520	572,550	10,000
September 30,	401,342	4,749	36,542	558	—	—
December 31,	—	—	263,000	3,446	—	—
Total	532,354	$ 6,555	929,116	$ 13,446	572,550	$ 10,000

Net Loss per Common Share

Basic net loss per common share is computed on the basis of the weighted average common shares outstanding. Diluted net loss per common share is computed on the basis of the weighted average common shares outstanding plus the effect of all potentially dilutive common shares, including unvested and outstanding equity awards. The components of basic and diluted net loss per common share were as follows for the periods stated:

	For the Year Ended December 31,		
(in thousands, except for share and per share amounts)	**2019**	**2018**	**2017**
Numerator:			
Net loss	$ (10,765)	$ (1,479)	$ (15,306)
Denominator:			
Basic and diluted weighted average outstanding shares of common stock	19,089,402	19,667,891	20,210,260
Basic and diluted net loss per common share	$ (0.56)	$ (0.08)	$ (0.76)

For the years ended December 31, 2019, 2018 and 2017, the following securities were not included in the calculation of diluted shares outstanding as the effect would have been anti-dilutive:

	For the Year Ended December 31,		
	2019	**2018**	**2017**
Restricted stock units	189,862	178,279	90,665

Share-based Compensation Plans

On March 23, 2012, our Board of Directors adopted the Spok Holdings, Inc. 2012 Equity Incentive Award Plan (the "2012 Equity Plan") that was subsequently approved by our stockholders on May 16, 2012. A total of 2,194,986 shares of common stock have been reserved for issuance under this plan.

Awards under the 2012 Equity Plan may be in the form of stock options, common stock, restricted stock, RSUs, performance awards, dividend equivalents, deferred stock, deferred stock units, or stock appreciation rights.

Restricted stock awards generally vest one year from the date of grant. Related dividends accumulate during the vesting period and are paid at the time of vesting.

Contingent RSU's generally vest over a three-year performance period upon successful completion of the performance objectives. Non-contingent RSU's generally vest in thirds, annually, over a three-year period. Dividend equivalents rights generally accompany each RSU award and those rights accumulate and vest along with the underlying RSU.

The following table summarizes the activities under the 2012 Equity Plan from January 1, 2017 through December 31, 2019:

	Activity
Total equity securities available at January 1, 2017	1,246,939
Less: RSU and restricted stock awarded to eligible employees, net of forfeitures	(106,281)
Total equity securities available at December 31, 2017	1,140,658
Less: RSU and restricted stock awarded to eligible employees, net of forfeitures	(236,221)
Total equity securities available at December 31, 2018	904,437
Less: RSU and restricted stock awarded to eligible employees, net of forfeitures	(257,957)
Total equity securities available at December 31, 2019	646,480

The following table details activities with respect to outstanding RSUs and restricted stock for the year ended December 31, 2019:

	Shares	Weighted-Average Grant Date Fair Value
Unvested at January 1, 2019	404,325	$ 17.27
Granted	388,321	13.27
Vested	(242,856)	17.48
Forfeited	(130,364)	15.49
Unvested at December 31, 2019	419,426	$ 14.00

Of the 419,426 unvested RSUs and restricted stock outstanding at December 31, 2019, 273,788 RSUs include contingent performance requirements for vesting purposes. At December 31, 2019, there was $3.1 million of unrecognized net compensation cost related to RSUs and restricted stock, which is expected to be recognized over a weighted average period of 1.60 years.

Employee Stock Purchase Plan

In 2016, our Board of Directors adopted the ESPP that was subsequently approved by our stockholders on July 25, 2016. A total of 250,000 shares of common stock have been reserved for issuance under this plan.

The Company's ESPP allows employees to purchase shares of common stock at a discounted rate, subject to plan limitations. Under the ESPP, eligible participants can voluntarily elect to have contributions withheld from their pay for the duration of an offering period, subject to the ESPP limits. At the end of an offering period, contributions will be used to purchase the Company's common stock at a discount to the market price based on the first or last day of the offering period, whichever is lower. Participants are required to hold common stock for a minimum period of two years from the grant date. Participants will begin earning dividends on shares after the purchase date. Each offering period will generally last for no longer than six months. Once an offering period begins, participants cannot adjust their withholding amount. If a participant chooses to withdraw, any previously withheld funds will be returned to the participant, with no stock purchased, and that participant will be eligible to participate in the ESPP at the next offering period. If the participant terminates employment with the Company during the offering period, all contributions will be returned to the employee and no stock will be purchased at a discounted rate.

The Company uses the Black-Scholes model to calculate the fair value of each offering period on their offer date. The Black-Scholes model requires the use of estimates for the expected term, the expected volatility of the underlying common stock over the expected term, the risk-free interest rate and the expected dividend payment.

For the year ended December 31, 2019, employees purchased 23,299 shares of common stock for a total price of $0.3 million. For the year ended December 31, 2018, employees purchased 20,120 shares of common stock for a total price of $0.2 million.

The following table summarizes the activities under the ESPP from January 1, 2017 through December 31, 2019:

	Activity
Total ESPP equity securities available at January 1, 2017	246,039
Less: common stock purchased by eligible employees	(17,760)
Total ESPP equity securities available at January 1, 2018	228,279
Less: common stock purchased by eligible employees	(20,120)
Total ESPP equity securities available at January 1, 2019	208,159
Less: common stock purchased by eligible employees	(23,299)
Total ESPP equity securities available at December 31, 2019	184,860

Amounts withheld from participants will be classified as a liability on the balance sheet until funds are used to purchase shares. This liability amount is immaterial to the consolidated financial statements.

Stock-Based Compensation Expense

Compensation expense associated with common stock, RSUs and restricted stock was recognized based on the grant date fair value of the instruments, over the instruments' vesting period.

The following table reflects stock based compensation expense for the periods stated:

	For the Year Ended December 31,		
(Dollars in thousands)	**2019**	**2018**	**2017**
Performance-based RSUs	$ 1,434	$ 2,127	$ 1,762
Time-based RSUs and restricted stock	2,119	2,756	1,862
ESPP	90	71	64
Total stock based compensation	$ 3,643	$ 4,954	$ 3,688

NOTE 9 - INCOME TAXES

The Tax Cuts and Jobs Act of 2017 ("2017 Tax Act") was signed into law on December 22, 2017. The 2017 Tax Act significantly revised the U.S. corporate income tax by, among other things, lowering the statutory corporate tax rate from 35% to 21%, eliminating certain deductions, imposing a mandatory one-time tax on accumulated earnings of foreign subsidiaries, introducing new tax regimes, and changing how foreign earnings are subject to U.S. tax. The 2017 Tax Act also enhanced and extended through 2026 the option to claim accelerated depreciation deductions on qualified property. We have completed our determination of the accounting implications of the 2017 Tax Act on our tax accruals.

The significant components of our income tax (benefit) expense attributable to current operations for the periods stated were as follows:

	For the Year Ended December 31,		
(Dollars in thousands)	**2019**	**2018**	**2017**
(Loss) income before income tax (benefit) expense	$ (13,423)	$ (2,185)	$ 11,559
Current:			
Federal tax	$ —	$ —	$ 199
State tax	582	838	1,006
Foreign tax	13	148	270
Total current	595	986	1,475
Deferred:			
Federal tax	(2,121)	(1,467)	26,348
State tax	(1,239)	(532)	(787)
Foreign tax	107	307	(171)
Total deferred	(3,253)	(1,692)	25,390
Total income tax (benefit) expense	$ (2,658)	$ (706)	$ 26,865

Foreign income before income tax (benefit) expense is immaterial to consolidated income before income tax (benefit) expense.

The following table summarizes the principal elements of the difference between the United States Federal statutory rate of 21% and our effective tax rate:

Effective tax rate reconciliation	**2019**		**2018**		**2017**	
(Dollars in thousands)						
(Loss) income before income tax (benefit) expense	$ (13,423)		$ (2,185)		$ 11,559	
Income taxes computed at the Federal statutory rate	$ (2,819)	21.0 %	$ (459)	21.0 %	$ 4,046	35.0 %
State income taxes, net of Federal benefit	(567)	4.2 %	306	(14.0)%	472	4.1 %
Goodwill impairment	2,243	(16.7)%	—	— %	—	— %
Impact of 2017 Tax Act	—	— %	—	— %	24,235	209.7 %
Research and development and other tax credits	(1,790)	13.3 %	(1,144)	52.4 %	(1,775)	(15.4)%
Excess executive compensation	322	(2.4)%	281	(12.9)%	—	— %
Other	(47)	0.4 %	310	(14.2)%	(113)	(1.0)%
(Benefit from) provision for income taxes	$ (2,658)	19.8 %	$ (706)	32.3 %	$ 26,865	232.4 %

The anticipated effective income tax rate is expected to continue to differ from the Federal statutory rate primarily due to the effect of state income taxes, the benefit of the research and development tax credit, permanent differences between book and taxable income and certain discrete items. The earnings of non-U.S. subsidiaries are deemed to be indefinitely reinvested in non-U.S. operations.

The components of deferred income tax assets at December 31, 2019 and 2018 were as follows:

	December 31,				
(Dollars in thousands)	2019			2018	
Capitalized research and development costs	$	18,605		$	14,219
Net operating loss carryforward		15,978			18,851
Property and equipment		6,092			5,969
Accrued liabilities, reserves and other expenses		3,718			3,837
Research and development credits		4,140			2,360
Tax credits		1,467			2,141
Stock based compensation		1,600	12		1,739
Other		121			200
Gross deferred income tax assets		51,721			49,316
Deferred income tax liabilities:					
Intangible assets		(2,430)			(2,711)
Prepaid and other expenses		(308)			(121)
Gross deferred income tax liabilities	$	(2,738)		$	(2,832)
Net deferred income tax assets	$	48,983		$	46,484

Net Operating Losses

As of December 31, 2019, we had approximately $71.2 million of NOLs available to offset future taxable income. The Federal NOLs begin expiring in 2026 and will fully expire in 2029. We have an immaterial amount of foreign NOLs and tax credits available for future use.

Valuation Allowance

We assess the recoverability of our deferred income tax assets, which represent the tax benefits of future tax deductions, NOLs and tax credits, by considering the adequacy of future taxable income from all sources, including prudent and feasible tax planning strategies. This assessment is required to determine whether based on all available evidence, it is “more likely than not” (which means a probability of greater than 50%) that all or some portion of the DTAs will be realized in future periods. As of December 31, 2019 and 2018, we believe it is more likely than not that our DTAs will be realized in future periods and thus did not have a valuation allowance.

Income Tax Audits

The 2017, 2018 and 2019 Federal and state income tax returns are within the statute of limitations (“SOL”) and are currently not under examination by any Federal or state tax authority.

We operate in all states and the District of Columbia and are subject to various state income and franchise tax audits. The states’ SOL varies from three to four years from the later of the due date of the return or the date filed. We usually file our Federal and all state and local income tax returns on or before September 15 of the following year; therefore, the SOL for those states with a three-year SOL is open for calendar years ending 2016 through 2019, and for the four-year SOL states, the SOL is open for years ending from 2015 through 2019.

NOTE 10 - COMMITMENTS AND CONTINGENCIES

Contractual Obligations

We had no significant commitments and contractual obligations as of December 31, 2019.

Other Commitments

We have various LOCs outstanding with multiple state agencies which are considered to be immaterial to the consolidated financial statements. The LOCs typically have one to three-year contract requirements and contain automatic renewal terms.

Legal Contingencies

We are involved, from time to time, in lawsuits arising in the normal course of business. We believe these pending lawsuits will not have a material adverse impact on our financial position or statement of operations.

Operating Leases

We have operating leases for office and transmitter locations. Substantially all of these leases have lease terms ranging from one month to five years. We continue to review our office and transmitter locations, and intend to replace, reduce or consolidate leases, where possible.

Future minimum lease payments under non-cancelable operating leases at December 31, 2019 were as follows:

For the Year Ended December 31,	(Dollars in thousands)	
2020	$	6,792
2021		5,056
2022		3,039
2023		1,968
2024		498
Thereafter		217
Total	$	17,570

These leases typically include renewal options and escalation clauses. Where material, we recognize rent expense on a straight-line basis over the lease period.

Total rent expense under operating leases for the years ended December 31, 2019, 2018 and 2017, was approximately $17.7 million, $17.5 million and $17.7 million, respectively.

NOTE 11 - EMPLOYEE BENEFIT PLANS

Spok Holdings, Inc. Savings and Retirement Plan

The Company has a savings plan in the U.S. that qualifies under Section 401(k) of the Internal Revenue Code ("IRC"). Participating U.S. employees may elect to contribute a percentage of their salary, subject to certain limitations. Matching contributions under the savings plan were approximately $1.6 million for the years ended December 31, 2019 and 2018 and $1.1 million for the year ended December 31, 2017.

NOTE 12 - RELATED PARTIES

A member of our Board of Directors also serves as a director for an entity that leases transmission tower sites to the Company. We incurred $3.6 million for the years ended December 31, 2019 and 2018 and $3.8 million for the same period in 2017 of site rent expense from the entity on which the individual serves as a director. These amounts are included in technology operations expenses.

NOTE 13 - SELECTED QUARTERLY FINANCIAL INFORMATION (UNAUDITED)

Quarterly financial information for the years ended December 31, 2019 and 2018 is summarized below:

For the Year Ended December 31, 2019	First Quarter	Second Quarter	Third Quarter	Fourth Quarter[3]
	(Dollars in thousands except per share amounts)			
Revenues[1]	$ 41,764	$ 39,525	$ 39,453	$ 39,548
Operating income (loss)[1]	1,115	(1,992)	(2,692)	(12,239)
Net income (loss)[1]	742	(670)	(1,326)	(9,511)
Basic and diluted net income (loss) per common share[2]	0.04	(0.03)	(0.07)	(0.50)
For the Year Ended December 31, 2018	**First Quarter**	**Second Quarter**	**Third Quarter**	**Fourth Quarter**
	(Dollars in thousands except per share amounts)			
Revenues[1]	$ 43,114	$ 40,628	$ 42,476	$ 43,256
Operating income (loss)[1]	584	(2,346)	(1,560)	149
Net income (loss)[1]	345	(1,172)	(840)	189
Basic and diluted net income (loss) per common share[2]	0.02	(0.06)	(0.04)	0.01

(1) Slight variations in totals are due to rounding.
(2) Basic and diluted net income (loss) per common share is computed independently for each period presented. As a result, the sum of the quarterly basic and diluted net income (loss) per common share for the years ended December 31, 2019 and 2018 may not equal the total computed for the year.
(3) During the fourth quarter of 2019, the Company recorded a goodwill impairment of $8.8 million. See Note 6 "Goodwill and Intangible Assets, Net" for additional details.

SCHEDULE II

SPOK HOLDINGS, INC.
VALUATION AND QUALIFYING ACCOUNTS

Allowance for Doubtful Accounts, Service Credits and Other	Balance at the Beginning of the Period	Charged to Operations	Write-offs	Balance at the End of the Period
	(Dollars in thousands)			
Year ended December 31, 2019	$ 1,705	$ 1,248	$ (1,660)	$ 1,293
Year ended December 31, 2018	$ 1,065	$ 2,125	$ (1,485)	$ 1,705
Year ended December 31, 2017	$ 1,056	$ 1,035	$ (1,026)	$ 1,065

EXHIBIT INDEX

Exhibit Number	Exhibit Description	Incorporated by Reference: Form	File No.	Exhibit	Filing Date	Filed/Furnished Herewith
3.1	Amended and Restated Certificate of Incorporation	8-K	001-32358	3.1	7/8/2014	
3.2	Second Amended and Restated Bylaws	8-K	001-32358	3.1	12/20/2016	
4.1*	Specimen of common stock certificate, par value $0.0001 per share	S-4/A	333-115769	4.1	10/6/2004	
10.1	Form of Indemnification Agreement for executive officers of Spok, Holding Inc.	10-Q	001-32358	10.1	10/25/2018	
10.2*	USA Mobility, Inc. Equity Incentive Plan Restricted Stock Agreement (For Board of Directors) (amended)	10-Q	001-32358	10.18	11/1/2007	
10.3*	Form of Director’s Indemnification Agreement	10-Q	001-32358	10.24	10/30/2008	
10.4*	USA Mobility, Inc. 2012 Equity Incentive Award Plan	DEF 14A	001-32358	A	3/28/2012	
10.5†	Employment Agreement, between Spok Holdings, Inc. and Vince D. Kelly, dated as of January 1, 2019	8-K	001-32358	10.1	1/4/2019	
10.6*	Restricted Stock Unit Grant Notice for the USA Mobility, Inc. 2012 Equity Incentive Award Plan	10-K	001-32358	10.16	3/2/2017	
10.7	Restricted Stock Unit Grant Notice for the Spok Holdings, Inc. 2015 Long-Term Incentive Plan	10-K	001-32358	10.17	3/2/2017	
10.8*†	Spok Holdings, Inc. Severance Pay Plan and Summary Plan Description (For certain C-Level, not including CEO) (amended and restated)	10-K	001-32358	10.18	3/2/2017	
10.9†	Spok Holdings, Inc. 2015 Long-Term Incentive Plan	10-K	001-32358	10.10	3/1/2018	
10.10†	Exhibits to Spok Holdings, Inc., 2015 Long-Term Incentive Plan for the 2016 - 2018 performance period	10-K	001-32358	10.10	2/28/2019	
10.11†	Spok Holdings, Inc. 2017 Short-Term Incentive Plan	10-K	001-32358	10.13	3/1/2018	
10.12†	Exhibits to Spok Holdings, Inc., 2015 Long-Term Incentive Plan for the 2017 - 2019 performance period					Filed
10.13†	Spok Holdings, Inc. 2018 Short-Term Incentive Plan	10-K	001-32358	10.15	2/28/2019	
10.14†	Spok Holdings, Inc. 2018 Long-Term Incentive Plan(1)	10-K	001-32358	10.16	3/1/2018	
10.15†	Spok Holdings, Inc. 2019 Short-Term Incentive Plan	10-K	001-32358	10.16	2/28/2019	
10.16†	Spok Holdings, Inc. 2020 Short-Term Incentive Plan					Filed
10.17*	Amendment to the USA Mobility, Inc. 2012 Equity Incentive Award Plan	DEF 14A	001-32358	A	4/27/2017	
10.18†	NEO Severance and Change in Control Document	10-Q	001-32358	10.2	4/27/2017	
21	Subsidiaries of the Company	10-K	001-32358	21	3/1/2018	
23	Consent of Grant Thornton LLP					Filed
31.1	Certification of President and Chief Executive Officer pursuant to Rule 13a-14(a)/Rule 15d-14(a) of the Securities Exchange Act of 1934, as amended					Filed
31.2	Certification of Chief Financial Officer pursuant to Rule 13a-14(a)/Rule 15d-14(a) of the Securities Exchange Act of 1934, as amended					Filed
32.1	Certification of President and Chief Executive Officer pursuant to 18 U.S.C. Section 1350					Furnished
32.2	Certification of Chief Financial Officer pursuant to 18 U.S.C. Section 1350					Furnished
101.INS	XBRL Instance Document**					Furnished
101.SCH	XBRL Taxonomy Extension Schema**					Furnished
101.CAL	XBRL Taxonomy Extension Calculation**					Furnished
101.DEF	XBRL Taxonomy Extension Definition**					Furnished
101.LAB	XBRL Taxonomy Extension Labels**					Furnished
101.PRE	XBRL Taxonomy Extension Presentation**					Furnished

* On July 8, 2014, the Company changed its name from USA Mobility, Inc. to Spok Holdings, Inc.

** The financial information contained in these XBRL documents is unaudited.

† Denotes a management contract or compensatory plan or arrangement.

(1) Portions of this document have been omitted and filed separately with the Securities and Exchange Commission pursuant to requests for confidential treatment pursuant to Rule 24b-2.

Exhibit 10.12

Exhibit E

Performance Goals

2017-2019 Performance Period

Spok 2017 Long Term Incentive Plan (LTIP) Payout Scale

Wireless Revenue (20%) ($ in millions)	Result	Performance	Payout
Over Perform	$287.570	110.0%	130.0%
	$274.498	105.0%	120.0%
	$267.963	102.5%	110.0%
	$264.041	101.0%	105.0%
Target	**$261.427**	**100.0%**	**100.0%**
Under Perform	$248.356	95.0%	95.0%
	$235.284	90.0%	90.0%
	$222.213	85.0%	85.0%
	$209.142	80.0%	80.0%
	< $209.142	< 80.0%	0.0%

Operations Bookings (50%) ($ in millions)	Result	Performance	Payout
Over Perform	$136.981	110.0%	150.0%
	$130.754	105.0%	137.5%
	$127.641	102.5%	125.0%
	$125.773	101.0%	112.5%
Target	**$124.528**	**100.0%**	**100.0%**
Under Perform	$118.302	95.0%	95.0%
	$112.075	90.0%	90.0%
	$105.849	85.0%	85.0%
	$99.622	80.0%	80.0%
	< $99.622	< 80.0%	0.0%

Operating and Capital Expenses (30%) [1] ($ in millions)	Result	Performance	Payout
Over Perform	$390.299	80.0%	125.0%
	$414.693	85.0%	120.0%
	$439.087	90.0%	115.0%
	$463.480	95.0%	107.5%
Target	**$487.874**	**100.0%**	**100.0%**
Under Perform	$512.268	105.0%	95.0%
	$536.661	110.0%	90.0%
	$561.055	115.0%	85.0%
	$585.449	120.0%	80.0%
	> $585.449	>120.0%	0.0%

[1] Operating and Capital Expenses exclude severance and stock based compensation expense.

Amount is calculated as follows:		2017	2018	2019	Total
Operating Expenses		$ 156,009	$ 160,460	$ 164,911	481,380
Capital Expenses		9,831	5,775	5,060	20,666
Less:	Severance	(216)	(92)	(67)	(375)
	Stock Based Compensation	(4,536)	(4,550)	(4,711)	(13,797)
Operating and Capital Expenses		$ 161,088	$ 161,593	$ 165,193	$ 487,874

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Exhibit F

List of Spok Holdings, Inc., Participants (as of January 1, 2017)

2017-2019 Performance Period

Name, Corporate Employee	Title
Executives	
Kelly, Vince	CEO*
Goel, Hemant	President
Endsley, Shawn	CFO
Saine, Tom	CIO
Woods, Sharon	Corp Secretary/Treasurer
Culp, Bonnie	EVP, H.R. & CCO
Soucy, Don	EVP, Sales
Vice Presidents	
Gunderson, Kyle	VP, Development & CTO
Ling, Mick	VP, Maintenance Revenue
Olson-Stepp, Terri	VP, Professional Services
Edds, Brian	VP, Product Strategy
DeBoer, John	VP, Technical Engineering
Czop, Mike	VP, Technical Operations
Scott, Donna	SVP, Marketing
Van Wijk, Mathilde	VP, Customer Support
Giorgi, Vincent	VP, Alliances
Mellin, Andrew	CMO
Guyton, Nate’	CNO
Robinson, Donna	DVP Sales
Kendzierski, Michael	DVP, Sales
Gildea, Brian	RVP, Sales
Was, Jonathan	RVP, Sales
Stein, James	RVP, Sales
Cardelino, Jason	RVP, Sales

*The Chief Executive Officer participates in the Plan pursuant to his employment agreement.

Exhibit 10.16

Spok Holdings, Inc.
2020 Short-Term Incentive Plan
(Effective January 1, 2020)

I. Effective Date. The 2020 Short-Term Incentive Plan (the "Plan") for Spok Holdings, Inc., was adopted by the Compensation Committee of the Board of Directors (the "Compensation Committee") of Spok Holdings, Inc., (the "Parent" or the "Company"), a Delaware corporation for the employees of Spok, Inc., a Delaware corporation and an indirect wholly-owned subsidiary of the Parent ("Spok") on December 17, 2020. The Plan is effective as of January 1, 2020 and supersedes and replaces all former management short-term incentive plans, including the Spok Holdings, Inc., 2019 Short-Term Incentive Plan.

II. Purpose. The Plan is designed to attract, motivate, retain and reward key employees for their performance during the calendar year, from January 1 through December 31, 2020 (the "Performance Period"). The Plan rewards key employees by allowing them to receive cash bonuses based on how well the Company performs against the performance objectives as set forth by the Compensation Committee and, as may be adjusted by the Compensation Committee in the event of a Change of Control or other corporate reorganization, merger, similar transaction, to take into account extraordinary events or as the Compensation Committee determines is in the best interests of the Company. In order for bonuses to be earned, the Company must meet the quantitative Performance Objectives and the Management by Objective (MBO) criteria as by December 31, 2020. Performance Objectives are based solely on the consolidated performance of the Company. For clarity, Performance Objectives and the attainment thereof does not include revenue or expenses related to acquisitions or due diligence expenses occurring after the Effective Date of this Plan except as directed by the Compensation Committee.

III. Eligibility. Participation in the Plan is limited to those key employees who are selected for participation in the Plan by the Compensation Committee, in its sole discretion (each such individual, a "Participant"). Individuals selected by the Compensation Committee to participate as of January 1, 2020 are listed on Exhibit A. Newly hired or promoted employees, or employees who otherwise become eligible to participate, who are selected to participate in the Plan after January 1, 2020 but before October 1, 2020 will participate in the Plan on a prorated basis based on the number of days worked during the performance period after becoming bonus eligible. Employees who are newly hired or promoted on or after October 1, 2020 will not be eligible to participate in the Plan.

IV. Target Bonus. The target bonus for each Participant is based on a percentage of the Participant's annual (or prorated, if applicable) salary as of January 1, 2020 (or date of hire or promotion to an eligible position, if later). The applicable percentage is determined by the Compensation Committee with respect to executives earning $250,000 or more and by the CEO for other management and need not be identical among Participants. The earned bonus may be greater than or less than the target bonus depending on the level at which the Performance Objectives are attained.

V. Payment of Earned Bonus.

   a. Except as provided herein, each earned bonus under the Plan will be calculated based on the attainment of the Performance Objectives and will be paid in a lump sum (subject to any required withholding for income and employment taxes) after the 2020 annual audit of the Parent's consolidated financial statement has been completed and the Parent's 2020 Annual Report on Form 10-K has been filed with the Securities and Exchange Commission but in no event later than December 31, 2021.

   b. If the Participant involuntarily Separates from Service without Cause or due to disability or dies prior to December 31, 2020, he or she will be eligible to receive a prorated bonus provided that the Company is on track to attain the Performance Objectives as reasonably determined by the Compensation Committee and provided further that, in the event Participant involuntarily Separates from Service without Cause, he or she has executed a release, any waiting period in connection with such release has expired, he or she has not exercised any rights to revoke the release and he or she has followed any other applicable and customary termination procedures, as determined by the Parent in its sole discretion. The bonus will be prorated to the date of Participant's Separation from Service or death, calculated as follows: one-hundred percent (100%) of a Participant's target bonus will be multiplied by a fraction, the numerator of which is the number of days the Participant was continuously providing services to the Company from January 1, 2020 through the date immediately prior to the Participant's Separation from Service or death, and the denominator of which is 365 days. Prorated bonuses will be paid to the Participant, or in the event of Participant's death, the Participant's estate, on the sixty-fifth (65th) day following the date of Participant's Separation from Service or death.

i. For purposes of the Plan, "Separation from Service" shall have the meaning provided in the Treasury Regulations under section 409A of the Internal Revenue Code of 1986, as amended (the "Code"), and "Separates from Service" shall have a consistent meaning. Unless otherwise defined in an employment agreement between the Participant and the Parent or the Company, for purposes of the Plan, "Cause" means (i) dishonesty of a material nature that relates to the performance of services for the Company by Participants; (ii) criminal conduct (other than minor infractions and traffic violations) that relates to the performance of services for the Company by Participant; (iii) the Participant's willfully breaching or failing to perform his or her duties as an employee of the Company (other than any such failure resulting from the Participant having a disability (as defined herein)), within a reasonable period of time after a written demand for substantial performance is delivered to the Participant by the Compensation Committee, which demand specifically identifies the manner in which the Compensation Committee believes that the Participant has not substantially performed his duties; or (iv) the willful engaging by the Participant in conduct that is demonstrably and materially injurious to the Parent, Company or an Affiliate, monetarily or otherwise. No act or failure to act on the Participant's part shall be deemed "willful" unless done, or omitted to be done; by the Participant not in good faith and without reasonable belief that such action or omission was in the reasonable best interests of the Parent, Company and Affiliates. For this purpose, "disability" means a condition or circumstance such that the Participant has become totally and permanently disabled as defined or described in the Parent's long term disability benefit plan applicable to executive officers as in effect at the time the Participant incurs a disability.

c. Notwithstanding anything to the contrary in this Plan, no payments contemplated by this Plan will be paid during the six-month period following a Participant's Separation from Service unless the Company determines, in its good faith judgment, that paying such amounts at the time indicated in paragraph b above would not cause the Participant to incur an additional tax under Code section 409A (a)(2)(B)(i), in which case the bonus payment shall be paid in a lump sum on the first day of the seventh month following the Participant's Separation from Service.

VI. Forfeiture. Any Participant whose employment is terminated for Cause or who voluntarily Separates from Service prior to the date bonuses are paid shall forfeit any right to receive a bonus award.

VII. Clawback. The Compensation Committee of the Board may require forfeiture or a clawback of any incentive compensation awarded or paid under this Plan in excess of the compensation actually earned based on a restatement of the Company's financial statements as filed with the Securities and Exchange Commission for the period covered by this Plan.

VIII. Administrator. The Compensation Committee shall administer the Plan in accordance with its terms, and shall have full discretionary power and authority to construe and interpret the Plan; to prescribe, amend and rescind rules and regulations, terms, and notices hereunder; and to make all other determinations necessary or advisable in its discretion for the administration of the Plan. Any actions of the Compensation Committee with respect to the Plan shall be conclusive and binding upon all persons interested in the Plan. The Compensation Committee, in its sole discretion and on such terms and conditions as it may provide, may delegate all or part of its authority and powers under the Plan to one or more directors and/or officers of the Parent or the Company.

IX. Amendment; Termination. The Compensation Committee, in its sole discretion, without prior notice to Participants, may amend or terminate the Plan, or any part thereof, including the Performance Objectives as described in Section II, at any time and for any reason, to the extent such action will not cause adverse tax consequences to a participant under Code section 409A. Any amendment or termination must be in writing and shall be communicated to all Participants. No award may be granted during any period of suspension or after termination of the Plan.

X. Miscellaneous.

a. No Rights as Employee. Nothing contained in this Plan or any documents relating to this Plan shall (a) confer on a Participant any right to continue in the employ of the Company; (b) constitute any contract or agreement of employment; or (c) interfere in any way with the Company's right to terminate the Participant's employment at any time, with or without Cause.

b. Tax Withholding. To the extent required by applicable federal, state, local or foreign law, the Company shall withhold all applicable taxes (including, but not limited to, the Participant's FICA and Social Security obligations) from any bonus payment.

c. Transferability. A Participant may not sell, assign, transfer or encumber any of his or her rights under the Plan.

d. Unsecured General Creditor. Participants (or their beneficiary) may seek to enforce any rights or claims for payment under the Plan solely as an unsecured general creditor of the Parent or Spok.

e. Successors. This Plan shall be binding upon and inure to the benefit of the Parent, Company and any successor to the Company and the Participant's heirs, executors, administrators and legal representatives.

f. Code Section 409A. The Plan is intended to be a nonqualified deferred compensation plan within the meaning of Code section 409A and shall be interpreted to meet the requirements of Code section 409A. To the extent that any provision of the Plan would cause a conflict with the requirements of Code section 409A, or would cause the administration of the Plan to fail to satisfy Code section 409A, such provision shall be deemed null and void to the extent permitted by applicable law. Nothing herein shall be construed as a guarantee of any particular tax treatment to a Participant.

g. Governing Law. All questions pertaining to the validity, construction and administration of the Plan shall be determined in accordance with the laws of the State of Delaware, without regard to conflicts of law provisions.

h. Integration. This document and each exhibit hereto represent the entire agreement and understanding between the Company and the Participants and supersede any and all prior agreements or understandings, whether oral or written, with the Company relating to the subject matter covered by this Plan.

i. Severability. In case any provision of this Plan shall be held illegal or invalid, such illegality or invalidity shall be construed and enforced as if said illegal or invalid provision had never been inserted herein and shall not affect the remaining provisions of this Plan, but shall be fully severable, and the Plan shall be construed and enforced as if any such illegal or invalid provision were not a part hereof.

[Execution page follows]

IN WITNESS WHEREOF, Spok Holdings, Inc., by its duly authorized officer acting in accordance with a resolution duly adopted by the Compensation Committee of the Board of Directors of Spok Holdings, Inc., has executed this Plan for the benefit of employees of Spok Holdings, Inc. and subsidiaries, effective as of January 1, 2020.

SPOK HOLDINGS, INC.

/s/ Vincent D. Kelly
Vincent D. Kelly, President & CEO

Exhibit 23

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We have issued our reports dated February 27, 2020, with respect to the consolidated financial statements and internal control over financial reporting included in the Annual Report of Spok Holdings, Inc. on Form 10-K for the year ended December 31, 2019. We consent to the incorporation by reference of said reports in the Registration Statements of Spok Holdings, Inc. on Forms S-8 (File No. 333-182444 and File No. 333-212724).

/s/ GRANT THORNTON LLP

Arlington, Virginia
February 27, 2020

Exhibit 31.1

CERTIFICATIONS

I, Vincent D. Kelly, certify that:

1. I have reviewed this Annual Report on Form 10-K of Spōk Holdings, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;

   c. Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d. Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   a. All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b. Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Dated: February 27, 2020

/s/ Vincent D. Kelly

Vincent D. Kelly

President and Chief Executive Officer

Exhibit 31.2

CERTIFICATIONS

I, Michael W. Wallace, certify that:

1. I have reviewed this Annual Report on Form 10-K of Spōk Holdings, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant’s other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;

   c. Evaluated the effectiveness of the registrant’s disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d. Disclosed in this report any change in the registrant’s internal control over financial reporting that occurred during the registrant’s most recent fiscal quarter (the registrant’s fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant’s internal control over financial reporting; and

5. The registrant’s other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant’s auditors and the audit committee of the registrant’s board of directors (or persons performing the equivalent functions):

   a. All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant’s ability to record, process, summarize and report financial information; and

   b. Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant’s internal control over financial reporting.

Dated: February 27, 2020

/s/ Michael W. Wallace

Michael W. Wallace

Chief Financial Officer

Exhibit 32.1

CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

Pursuant to 18 U.S.C. § 1350, as created by Section 906 of the Sarbanes-Oxley Act of 2002, the undersigned officer of Spōk Holdings, Inc. (the "Company") hereby certifies, to such officer's knowledge, that:

(i) the accompanying Annual Report on Form 10-K of the Company for the year ended December 31, 2019 (the "Report") fully complies with the requirements of Section 13(a) or Section 15(d), as applicable, of the Securities Exchange Act of 1934, as amended; and

(ii) the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: February 27, 2020

/s/ Vincent D. Kelly

Vincent D. Kelly
President and Chief Executive Officer

Exhibit 32.2

CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

Pursuant to 18 U.S.C. § 1350, as created by Section 906 of the Sarbanes-Oxley Act of 2002, the undersigned officer of Spōk Holdings, Inc. (the "Company") hereby certifies, to such officer's knowledge, that:

(i) the accompanying Annual Report on Form 10-K of the Company for the year ended December 31, 2019 (the "Report") fully complies with the requirements of Section 13(a) or Section 15(d), as applicable, of the Securities Exchange Act of 1934, as amended; and

(ii) the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: February 27, 2020

/s/ Michael W. Wallace

Michael W. Wallace

Chief Financial Officer