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

FORM 10-K

(Mark One)

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

For the Fiscal Year Ended December 31, 2021
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.)**
5911 Kingstown Village Pkwy, 6th Floor Alexandria, Virginia	**22315**
(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

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

None

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

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

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

Indicate by check mark whether the registrant has submitted electronically 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 ☒ 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	☒
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 has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒

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

The aggregate market value of the common stock held by non-affiliates of the registrant was $181 million based on the closing price of $9.62 per share on the NASDAQ National Market® on June 30, 2021.

The number of shares of registrant's common stock outstanding on February 14, 2022, was 19,742,512.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Definitive Proxy Statement for the 2022 Annual Meeting of Stockholders of the registrant, which will be filed with the Securities and Exchange Commission pursuant to Regulation 14A no later than May 2, 2022, 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:

- Risks related to our ongoing review of strategic alternatives to evaluate potential transactions that may affect our ownership or capital structure, including a sale of the Company or other actions that would maximize value for stockholders;
- Risks related to the stockholder rights plan adopted to allow our Board of Directors to conduct an orderly review of strategic alternatives;
- Risks related to the COVID-19 pandemic and its effect on our business and the economy;
- Other economic conditions such as recessionary economic cycles, higher interest rates, inflation and higher levels of unemployment;
- Risks related to the new strategic plan announced by our Board of Directors, including our ability to implement the restructuring program to discontinue Spok Go in accordance with our timing and cost expectations, maximize revenue and cash generation from our established businesses and return capital to stockholders through dividends and repurchases of shares of our common stock;
- Continuing decline in the number of paging units we have in service with customers, commensurate with a continuing decline in our wireless revenue;
- Our dependence on the U.S. healthcare industry;
- 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 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;
- Our ability to protect our rights in intellectual property that we own and develop and the potential for litigation claiming intellectual property infringement by us;
- Unauthorized breaches or failures in cybersecurity measures adopted by us and/or included in our products and services;
- Our ability to realize the benefits associated with our deferred income tax assets;
- Future impairments of our long-lived assets, amortizable intangible assets or goodwill; and
- Those matters that 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 quarterly reports on Form 10-Q and current reports on 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 products and services to enhance workflows for clinicians, support administrative compliance, and provide a better experience for patients.

Our headquarters is located at 5911 Kingstown Village Pkwy, 6th Floor, Alexandria, Virginia 22315, 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 2021 Annual Report on Form 10-K ("2021 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.

In February 2022, our Board of Directors announced a new strategic business plan. In accordance with this plan, the Company expects to discontinue Spok Go and intends to eliminate all associated costs. Additional information related to the new strategic business plan can be found throughout this 2021 Form 10-K.

Industry Overview

In March 2020, the World Health Organization declared COVID-19 a global pandemic. The pandemic has had a severe impact on the global economy and has caused a significant strain on the healthcare industry. In the early months of the pandemic, hospitals struggled to maintain capacity within their intensive care units, and most stopped performing elective procedures in order to reallocate bed capacity to meet the surge of critical COVID-19 patients. Simultaneously, non-emergency clinic visits declined, resulting in a marked decrease in total clinic visits and non-COVID-19-related hospitalizations. This placed a significant burden on hospital cash flow and revenue, which many organizations were still recovering from towards the end of 2020 and into 2021.

While the impact of COVID-19 has varied greatly from one organization or region to the next, in general, reducing costs was a critical theme for the healthcare provider industry in 2020 and 2021. Initially, many organizations furloughed employees or significantly slowed the contracting process for new products or services as they braced for the unknown impacts of this virus. Some organizations enacted a complete moratorium on product renewals and new purchases. As hospitals began to better manage their admissions process and capacity constraints, they began to resume performing elective procedures in the second half of 2020. As a result, we began to see improved operating levels during this period and into 2021. While we are likely to see some lingering and continued effects from COVID-19, barring the emergence of a severe COVID-19 variant of concern, which might have significant negative effects on the overall economy and our customer base specifically, we anticipate a return to pre-pandemic operating levels in 2022.

Aside from the serious impact that COVID-19 has had on the healthcare industry, 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 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 now require greater communication and better collaboration between clinicians in order to generate improvements in the quality, safety, satisfaction and efficiency of patient care delivery. 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 workflow automation, process improvement and, in limited circumstances, machine learning and 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 pressure for organizations to provide improved services with fewer resources place an even greater emphasis on the need for improved clinical communication and collaboration tools to meet the increasing requirements demanded by the healthcare industry in today’s marketplace. Our solutions help hospitals significantly increase the quality and safety of patient care delivery, while increasing patient and provider satisfaction and simultaneously increasing employee productivity, reducing costs and clinician burnout. This is accomplished through workflow enhancement; secure, reliable and integrated communication tools; and mobile accessibility.

Sales and Marketing

We offer a focused suite of unified clinical communication and collaboration solutions primarily to organizations in the healthcare sector. We generate wireless revenue from the sales of wireless messaging services, equipment, maintenance plans and/or equipment loss protection to both one-way and two-way messaging subscribers. We generate software revenue from the sale of our software solutions, including software licenses, professional services, equipment we procure from third parties, and post-contract support.

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, laboratory directors, radiology directors and contact center managers. The timing for a direct sale varies but may take from 6 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 wireless services that we do not provide directly, we contract with and invoice an intermediary for airtime services. For our software sales, relationships with alliance partners assist us in broadening the distribution of our products and further diversifying into markets outside of the healthcare provider vertical. We will continue to expand partnership efforts in 2022.

Within our target market, we have identified and focused our efforts to address the following 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.

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.

<u>Licenses and Messaging Networks</u>

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. Cost savings began to slow in 2019 and 2020 as compared to historical cost savings, and we expect this trend to continue in the future. As we reach certain minimum frequency commitments, as outlined by the FCC, we may 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

In alignment with our new strategic business plan announced in February 2022, our over-arching strategy is to prioritize free cash flow generation and the return of capital to stockholders, by maximizing revenue and cash generation from our established lines of business while effectively managing expenses. Through targeted investments in these important and valuable business lines, we aim to reinvigorate growth in our legacy software solutions and minimize wireless revenue attrition.

Particular areas of strategic emphasis include:

Acquire new customers and expand relationships within our existing customer base - We will continue to focus our sales and marketing efforts in the healthcare market in order to identify opportunities for new sales as well as grow revenues from our existing customer base. We have ongoing initiatives 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 near-term focus is on the domestic market.

We have a significant presence in the healthcare marketplace, and 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.

Minimize wireless revenue attrition - 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 revenue attrition.

We recognize that the number of wireless subscribers, units in service, and the related revenue will likely 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.

The introduction of our GenA pagers in November 2021 is a key initiative that we believe may slow our wireless revenue attrition. Further details on GenA pagers can be found under "GenA Pagers."

Enhance existing software applications - We will continue to invest in the development and enhancement of our Care Connect Suite products and services, although at a significantly reduced rate relative to our total research and development costs over the last several years. Targeted enhancements and continued development efforts are critical to our ability to maintain our core software maintenance revenue and are necessary to drive future software operations revenue. Additionally, targeted enhancements of the Spok Mobile application will be critical in our ability to help further mitigate wireless customer attrition.

Manage expenses – With a renewed focus on generating cash flow it is critical that we manage costs in alignment with our revenue. We will continue to look for ways to reduce our underlying cost structure should revenue continue to decline. While we will continue to invest in the business, we will do so in a more targeted manner to drive tangible earnings that can be returned to our stockholders.

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. In February 2022, our Board of Directors authorized an increase of our quarterly dividend to $0.325 per share of common stock, or $1.250 annually, in 2022, and they authorized the repurchase of up to $10.0 million of our common stock.

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. We also sell devices to resellers who lease or resell them to their subscribers and then sell messaging services utilizing our networks.

Wireless products and services revenue represented 55%, 56% and 55% of total consolidated revenue for the years ended December 31, 2021, 2020 and 2019, respectively. Demand for one-way and two-way messaging services declined during these years, and we believe demand will continue to decline for the foreseeable future. As demand for one-way and two-way messaging has declined, we have developed or added service offerings, including our GenA pagers discussed below, in order to optimize our revenue potential and mitigate the decline in our wireless revenues. We will continue to evaluate opportunities within our wireless business while providing customers the highest value possible.

Legacy Wireless Services

A subscriber to one-way messaging services may select coverage on a local, regional, or nationwide basis to best meet their messaging needs, while two-way messaging is generally offered on a nationwide basis. In addition, subscribers either contract to use a messaging device that we own for an additional fixed monthly fee, or they own the device used, after either purchasing it from us or from another vendor.

We offer exclusive one-way (T5) and two-way (T52) alphanumeric pagers that are configurable to support unencrypted or encrypted operation. When configured for encryption, these devices utilize AES-128 bit encryption, screen locking and remote wipe capabilities. With encryption, 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 and high reliability and availability benefits of paging. We also 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.

GenA Pagers

On November 16, 2021, we announced the launch of our newest pager, GenA. This one-way alphanumeric pager, available on our wide-area paging network, features a high resolution ePaper display, intuitive modern user interface, advanced HIPAA-compliant encryption and security features, over-the-air remote programming, and an antimicrobial housing. The ePaper display advances the user experience with its larger screen featuring a high-resolution, high-contrast display for easy reading in all conditions, while an automatic front-light eases reading messages in the dark. Users can select from various font sizes, and the large GenA display also leverages proportional fonts to maximize key information on a single screen.

GenA pagers also allow for superior message reception in buildings with difficult coverage conditions using the high-powered Spok 900MHz simulcast network. Enhanced over-the-air (OTA) programming through the Spok My Account customer web portal enables remote pager configuration changes such as updating the user’s name on the pager, assigning a pager to a group, deleting message data and encryption keys, modifying global security settings, and remotely unlocking the device. The GenA pager also provides advanced message management features allowing critical messages to be locked to prevent deletion or saved to a separate folder. In addition, separate inbox folders can be set up for group messages.

The GenA pager is the only product available on the market with these capabilities, and we maintain an exclusive arrangement with the product's manufacturer whereby it may not market or sell the product to any third party without our consent. Given the uniqueness of the GenA pager, we believe its development is a key initiative that may help slow our wireless revenue attrition.

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 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 individuals, 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 touch-tone 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-compliant, 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 convenience 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.

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 that are provided by a dedicated group of professional service employees. Our professional services include consultation, implementation, and training services. 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 each of the years ended December 31, 2021, 2020 and 2019.
- **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 27% of total consolidated revenue for the year ended December 31, 2021, 26% for the year ended December 31, 2020, and 25% for the year ended December 31, 2019.

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. With the exception of our GenA pagers, 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. However, the COVID-19 pandemic has contributed to global supply chain disruptions from which we are not immune. These disruptions may contribute to delayed production of certain of the products that we offer, including, but not limited to, our recently launched GenA pagers, which are assembled with certain microchip technology that has experienced, and may continue to experience, shortages. Such shortages may result in delayed delivery of the products that we offer to customers.

Intellectual Property

As of December 31, 2021, we held 79 trademarks and six patents, as well as four pending trademarks and one pending patent, which we believe are important to protect our intellectual property. We believe our intellectual property distinguishes our business from our competition and is integral to our continued success in the area of clinical communication and collaboration solutions. The expiration dates of these trademarks range from 2022 to 2033 and can be extended for ten-year periods upon renewals.

Customers

Our customers include businesses and their 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 us 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 2021, 2020 or 2019.

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.

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 messaging capabilities are generally available in today's mobile phone devices. Many of these companies possess far greater financial, technical and other resources than we do.

Most personal communication 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, Wi-Fi, 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 we have no competitors that offer a comprehensive set of software modules that match our product offerings, several competitors offer software similar to many of our solutions. Selected competitors for portions of our product portfolio include:

- ATN International, Inc.. - Mobile communications solutions;
- CareCloud, Inc. - Healthcare solutions;
- Castlight Health, Inc. - Software as a service health benefits platform;
- Computer Programs and Systems, Inc. - Healthcare IT solutions;
- Domo, Inc. - Cloud-based solutions;
- Globalstar, Inc. - Mobile communications solutions;
- Health Catalyst, Inc. - healthcare data and analytics;
- HealthStream, Inc. - Healthcare workforce solutions;
- NextGen Healthcare, Inc. - Healthcare solutions;
- Ooma, Inc. - Telecommunications;
- OptimizeRx Corporation. - Healthcare solutions;
- ORBCOMM Inc. - Network connectivity and device management solutions;
- Tabula Rasa Healthcare, Inc. - Healthcare Solutions; and
- Vocera Communications, Inc. - Mobile communications solutions.

In addition to these select competitors, substantially larger companies in the electronic medical records space such as Epic Systems Corporation, Cerner Corporation ("Cerner"), 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.

Furthermore, the healthcare sector continues to experience significant consolidation, in large part due to COVID-19, which has highlighted the need to improve patient outcomes, reduce the burden on providers and streamline operations. As certain industries have been challenged during the pandemic, many organizations are motivated to reduce costs and improve efficiencies while others attempt to enter new markets with complementary or divergent product offerings and drive growth. Large acquisitions have recently been announced, including Microsoft Corporation's proposed acquisition of Nuance Communications, Inc., and Oracle Corporation's proposed acquisition of Cerner. Should organizations of this size enter the markets in which we operate, they may have a competitive advantage through aggressive pricing power, established brand recognition, extensive capital resources, and broader delivery and distribution channels.

Research and Development

We maintain a product development group, a substantial portion of which is focused on the enhancement of existing software 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.

Human Capital

At December 31, 2021, and 2020, we had 563 and 602 full time equivalent ("FTE") employees, respectively. As part of the restructuring of our business in connection with the new strategic business plan announced by our Board of Directors in February 2022, we intend to eliminate approximately 175 positions, primarily in research and development, but also in professional services, selling and marketing, and back-office support functions. Our employees are not represented by labor unions or covered by a collective bargaining agreement.

Employee Health, Safety and Well-Being

Spok is committed to conducting its business operations in a manner that protects the health and safety of its employees, visitors, contractors and the public, and to the reduction of risks within our work centers. Spok believes that no job is so important that our employees cannot take the time to ensure the work is performed safely and in an environmentally conscious manner. Spok’s policies and procedures are intended to provide employees with the information needed to meet all federal, state and local guidelines for occupational health and safety.

The COVID-19 pandemic continues to affect our policies with regard to our employees, whose health and safety is our highest priority. Following strategies recommended by the Centers for Disease Control and Prevention, we have continued to implement enhanced safety measures, including restrictions on business travel, the implementation of remote work arrangements for our office-based employees, and liberal leave policies for employees who may be affected by illness, quarantines or childcare obligations. We are compliant with all federal, state and local regulations as applicable.

Diversity and Inclusion

As a global company, Spok strives to create an environment that embraces diversity and fosters inclusion. We recognize the value and contributions of individuals with a wide range of capabilities, experience, and perspectives, and draws upon this diversity to create value for our customers and maintain an effective and engaged workforce. Spok is committed to maintaining a work environment free from discrimination and harassment, and one where employees are treated with dignity and respect. We refuse to accept or tolerate harassment or discrimination against any employee or applicant for employment.

Spok has a council composed of employees and executive sponsors to provide feedback and make recommendations regarding our diversity and inclusion policies and practices. We believe that by promoting and supporting inclusiveness and by leveraging our organization’s diversity, we have a competitive advantage that allows us to innovate and draw from our workforce’s differing perspectives. By bringing together employees from diverse backgrounds and providing each an opportunity to develop their skills and actively contribute to our mission, we cultivate an engaged workforce which in turn helps us deliver value to our customers.

Ethical Standards

Integrity is a core tenet of Spok’s culture, and we have measures and controls in place to regularly ensure that our work and organization are held to the highest ethical standards. We provide numerous resources to our employees, including regular, annual training on maintaining these standards. We also maintain employee guidelines and policies that align with Spok’s Code of Business Conduct and Ethics.

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 we provide. 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 2022 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 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 to federal agencies.

Available Information

We make available on our website, *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 2021 Form 10-K or presented elsewhere by management from time to time.

Risks Related to our Business and Operations

Our Board of Directors has adopted a stockholder rights plan, which could delay or discourage a merger, tender offer, or assumption of control of the Company not approved by our Board of Directors.

On September 2, 2021, our Board of Directors entered into a Rights Agreement between the Company and Computershare Trust Company, N.A., as Rights Agent (as amended from time to time, the "Rights Agreement") with an expiration date of August 31, 2022, and a beneficial ownership trigger threshold of 10% (20% in the case of a passive institutional investor), subject to certain exceptions.

In connection with the Rights Agreement, a dividend was declared of one preferred stock purchase right (individually, a “Right” and collectively, the “Rights”) for each share of our common stock outstanding at the close of business on September 17, 2021. Each Right will entitle the registered holder thereof, after the Rights become exercisable and until August 31, 2022 (or the earlier redemption, exchange or termination of the Rights), to purchase from the Company one one-tenth of a share of Series A Junior Participating Preferred Stock, par value $0.00001 per share (the “Series A Preferred”), of the Company at a price of $50.95 per one one-tenth of a share of Series A Preferred.

The Rights Agreement was adopted in order to ensure our Board of Directors can conduct an orderly review of strategic alternatives and to provide our Board of Directors and stockholders with adequate time to make informed decisions regarding any potential transactions, including a sale of all or part of the Company. The Rights Agreement will not preclude our Board of Directors from considering an offer that is fair and in the best interests of our stockholders. However, the Rights Agreement could render more difficult, or discourage, a merger, tender offer, or assumption of control of the Company that is not approved by our Board of Directors, even if some stockholders consider such a transaction to be favorable. These deterrents could adversely affect the price of our common stock.

Our new strategic business plan may fail to deliver the results we expect, which could have a material adverse effect on our business, financial condition and operating results.

In February 2022, our Board of Directors announced a new strategic business plan that includes a restructuring of our business to discontinue Spok Go, eliminate all associated costs and optimize the Company’s existing structure to drive continued cost improvement, while placing a renewed focus on our existing and established business, including the Spok Care Connect Suite and our wireless service offerings. We cannot assure you that our plan to focus on our existing and established business will be successful or that we will be able to achieve growth in revenues related to our legacy software solutions and minimize wireless revenue attrition.

In addition, pursuant to the new strategic business plan, we will undertake various restructuring activities in an effort to better align our organizational structure and costs with our strategy. We cannot assure you that our estimates regarding the costs to be incurred or the future cost savings as a result of such restructuring activities will be accurate or that we will complete such restructuring activities within our expected timeframe. Also, we may experience a disruption in our ability to perform functions critical to our strategy as we undertake these restructuring activities. For example, these restructuring activities could result in significant disruptions to our operations, including adversely affecting the timeliness of product releases or our ability to acquire new customers or expand relationships with existing customers.

Any failure to successfully implement our new strategic business plan, including the restructuring activities contemplated thereby, could have a material adverse effect on our business, financial condition and operating results.

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

We have an active program to consolidate the number of wireless 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 wireless service to our existing subscribers, and there can be no assurance that any efforts to minimize that impact would be successful. Any adverse impact to our wireless service could lead to increases in the rate of gross subscriber cancellations and/or the level of wireless revenue erosion. Adverse changes in gross subscriber cancellations and/or wireless revenue erosion could have a material adverse effect on our business, financial condition and operating results.

We depend on highly skilled personnel, and, if we are unable to retain or hire qualified personnel, including as a result of our public announcement of our new strategic business plan or our review of strategic alternatives, 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 and 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.

In August 2021, we announced that we received an unsolicited proposal from a third party to acquire all of the outstanding shares of common stock of the Company, and, in September 2021, we announced that we have initiated a review of strategic alternatives to evaluate potential transactions, including a sale of the Company, and other actions that would maximize value for stockholders. Further, in February 2022, we announced a new strategic business plan that includes a restructuring of our business to discontinue Spok Go, eliminate all associated costs and optimize the Company's existing structure to drive continued cost improvement. The ongoing review of strategic alternatives, which may eventually result in a change in control of the Company, may create a perception of uncertainty regarding our future operations or employment needs, and therefore may limit our ability to retain or hire qualified personnel and may contribute to the unplanned loss of highly skilled employees through attrition.

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.

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.
- **Customer Uncertainty.** The recently announced new strategic business plan that includes a restructuring of our business to discontinue Spok Go may create a perception of uncertainty regarding our future operations, which may limit our ability to sell products and services to prospective customers. Additionally, this perceived uncertainty may contribute to an increase in churn of existing customers.

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 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 such business or the expenditures needed to develop such business; and
- 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.

Risks Related to the COVID-19 Pandemic and the Economy

Our business, financial condition and operating results have been, and will continue to be, adversely affected by the recent COVID-19 pandemic.

The COVID-19 pandemic has resulted in a widespread health crisis that has adversely affected businesses, economies and financial markets worldwide, and has caused significant volatility in U.S. and international debt and equity markets. In particular, healthcare organizations have faced, and will continue to face, substantial challenges in treating patients with COVID-19, such as the diversion of hospital staff and resources from ordinary functions to the treatment of COVID-19, supply, resource and capital shortages and the overburdening of staff and resource capacity.

Our business, financial condition and operating results have been, and will continue to be, adversely affected by the COVID-19 pandemic. For example, the COVID-19 pandemic has caused, and will continue to cause, delays in or the loss of revenue from services that require onsite implementation as well as delays in or the loss of software bookings, which directly impacts license and equipment revenues, as healthcare organizations are putting these projects on hold to focus limited resources and personnel capacity toward the treatment of COVID-19. We also may be affected by the cancellation of or delay in healthcare information technology and management systems conferences and exhibitions.

The COVID-19 pandemic has also contributed to global supply chain disruptions from which we are not immune. These disruptions may contribute to delayed production of certain of the products that we offer, including, but not limited to, our recently launched GenA pagers, which are assembled with certain microchip technology that has experienced, and may continue to experience, shortages. Such shortages may result in delayed delivery of the products that we offer to customers, and in certain circumstances, may increase our production costs.

The extent to which COVID-19 impacts our results will depend on future developments, which are highly uncertain and cannot be predicted. These developments may include the emergence of new COVID-19 variants of concern as well as actions taken to further contain the virus or treat its impact or the possible reinstatement of government or other restrictions implemented in certain locations, and the acceptance, distribution and effectiveness of new and existing vaccines and other medications to treat and prevent the spread of COVID-19.

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

Our business is sensitive to 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 that 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 for our wireless business and could cause delays in or the loss of software revenue or bookings, which impacts license, professional services, equipment and subscription revenues.

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 uncertainty created by the possibility of additional healthcare reform 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.

Risks Related to our Products and Services

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 from our wireless business.

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 one of our lower-priced 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 operating cash flow from our wireless business 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, and pay cash dividends to stockholders.

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 business, financial condition and operating results, including our continued ability to remain profitable, produce positive operating cash flow and pay cash dividends to stockholders.

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 result in 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.

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

We generate over 75% of our revenue 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 the COVID-19 pandemic, healthcare reform legislation and the reimbursement policies of 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.

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 6 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.

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 additional 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 respective 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 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. Litigation 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.

Risks Related to Technology

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.

System disruptions and security threats to our computer networks, satellite control or telecommunications systems, or to those of our service providers, 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, or those of our service providers, of unauthorized access, computer hackers, computer viruses, malicious code, organized cyber-attacks and other security problems and system disruptions (e.g., distributed denial of service (DDoS) attacks, ransomware attacks). 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, such as a ransomware attack that encrypts some or all of our or our service providers' systems, data or infrastructure. 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 online 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, a 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 intrusions, data breaches or failures in cybersecurity measures adopted by us or our service providers and/or included in our products and services could have a material adverse effect on our business.

Our security controls are designed to maintain the physical security of our facilities and to protect the systems that process and store our customers', suppliers' and employees' confidential information, as well as our own proprietary information. We are also dependent on a number of third-party providers of various technology, tools and services relating to, among other things, human resources, electronic communications, data storage, finance, and other business functions, and we are, of necessity, dependent on the security systems of these providers. Accidental or willful security breaches or other unauthorized access events committed or enabled by third parties or by our employees or contractors (for example, due to social engineering or phishing attacks) can impact the security of our facilities, our systems or the systems of our third-party providers, and the information maintained in such systems. In addition, the existence of computer viruses or malware in our or our service providers' data, software, products or services, as well as external cyberattacks and data breaches, could expose us to the risks of corruption, loss, and misappropriation of proprietary and confidential information. We also routinely transmit and receive proprietary and confidential information, including through third parties, which makes that information vulnerable to interception, misuse or mishandling.

We utilize a security framework that includes security policies and procedures, security appliances and software, third-party vulnerability testing, business continuity plans, and other administrative, physical and technical measures. The frequency and scope of cyberattacks has been steadily increasing, and attackers are increasingly sophisticated, using tools and techniques that we and our service providers may be unable to detect or identify, or that may cause significant delays in our detection or identification. Once identified, we and our service providers may be unable to investigate or remediate incidents due to attackers taking steps to obfuscate or remove forensic evidence and to circumvent logging tools and counter-measures, rendering us unable to anticipate or implement adequate preventative or restorative measures.

We and our service providers have, from time to time, been subject to unauthorized network intrusions, malware and other cyberattacks. Any theft, misuse of, or unauthorized access to confidential, personal or proprietary information as a result of such incidents 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, increased costs of investigation and remediation, 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, regulatory investigations and enforcement actions, as well as fines and other sanctions pursuant to data privacy and security rules and regulations, any or all of which could have a material adverse effect on our reputation, operations, business, profitability and financial condition. Any losses, costs and liabilities may not be covered by, or may exceed the coverage limits of, any or all of our applicable insurance policies.

Risks Related to our Financial Results

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. For example, we maintained a valuation allowance of $24.2 million and $22.1 million at December 31, 2021 and 2020, respectively, to reduce net deferred income tax assets as their realization did not meet the applicable more-likely-than-not criterion.

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, as a result of our periodic evaluation of our capitalized software development costs, we recorded an impairment charge of $15.7 million for the year ended December 31, 2021. Furthermore, as a result of our annual goodwill impairment testing that takes place in the fourth quarter of each year, we recognized a non-cash, pre-tax goodwill impairment charge of $25.0 million for the year ended December 31, 2020.

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 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 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.

Risks Related to Regulatory Matters

We are subject to data privacy and protection-related laws and regulation, and 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 in the European Union subject to the General Data Protection Regulation (the "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 data protection rules imposed by the GDPR, we may be required to put in place additional mechanisms that could be onerous and adversely affect our business, financial condition, and operating results.

Existing privacy-related laws and regulations in the United States and other countries are evolving and are subject to potentially differing interpretations, and various 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 wireless 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.

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 U.S. Court of Appeals for the DC Circuit 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 business, financial condition and operating results, including our continued ability to remain profitable, produce positive operating cash flow and pay cash dividends to stockholders.

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 operating results.

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 business, financial condition and operating results, including our continued ability to remain profitable, produce positive operating cash flow and pay cash dividends to stockholders.

ITEM 1B. *UNRESOLVED STAFF COMMENTS*

We had no unresolved SEC staff comments as of February 17, 2022.

ITEM 2. *PROPERTIES*

In March 2021, we relocated our corporate headquarters to a commercial property located in Alexandria, Virginia, consisting of approximately 26,000 square feet of space under a lease that will expire on September 30, 2026.

At December 31, 2021, we leased facility space, including our corporate headquarters, sales offices, technical facilities, warehouse and storage facilities in 51 locations in 26 states in the United States, one facility in Australia and one facility in the Middle East. The total leased space is approximately 170,000 square feet. At December 31, 2021, we owned three small parcels of land in three states in the United States.

At December 31, 2021, we leased transmitter sites on commercial broadcast towers, buildings and other fixed structures, some of which are free of charge, in approximately 2,836 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, 2021, we had 3,468 active transmitters on leased sites which provide service to our customers.

ITEM 3. *LEGAL PROCEEDINGS*

Refer to Note 11, "Commitments and Contingencies," in the Notes to Consolidated Financial Statements for information regarding legal proceedings in which we are involved.

PART II

ITEM 4. *MINE SAFETY DISCLOSURES*

Not applicable.

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 14, 2022, there were 2,950 holders of record of our common stock.

Dividends

The Company declared dividends totaling $10.2 million and $10.0 million during 2021 and 2020, respectively. Cash dividends declared for the years ended December 31, 2021, and 2020, respectively, include dividends related to unvested restricted stock units ("RSUs") and shares of unvested restricted common stock ("restricted stock") granted under the Company's Equity Plans (as defined below) 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, 2021:

(Dollars in Thousands) Year	Dividends Declared Per Share Amount	Total Payment[1]
Prior to 2017[2]	$ 18.275	$ 452,033
2017	0.500	15,234
2018	0.500	10,064
2019	0.500	9,819
2020	0.500	9,771
2021	0.500	10,025
Total	$ 20.775	$ 506,946

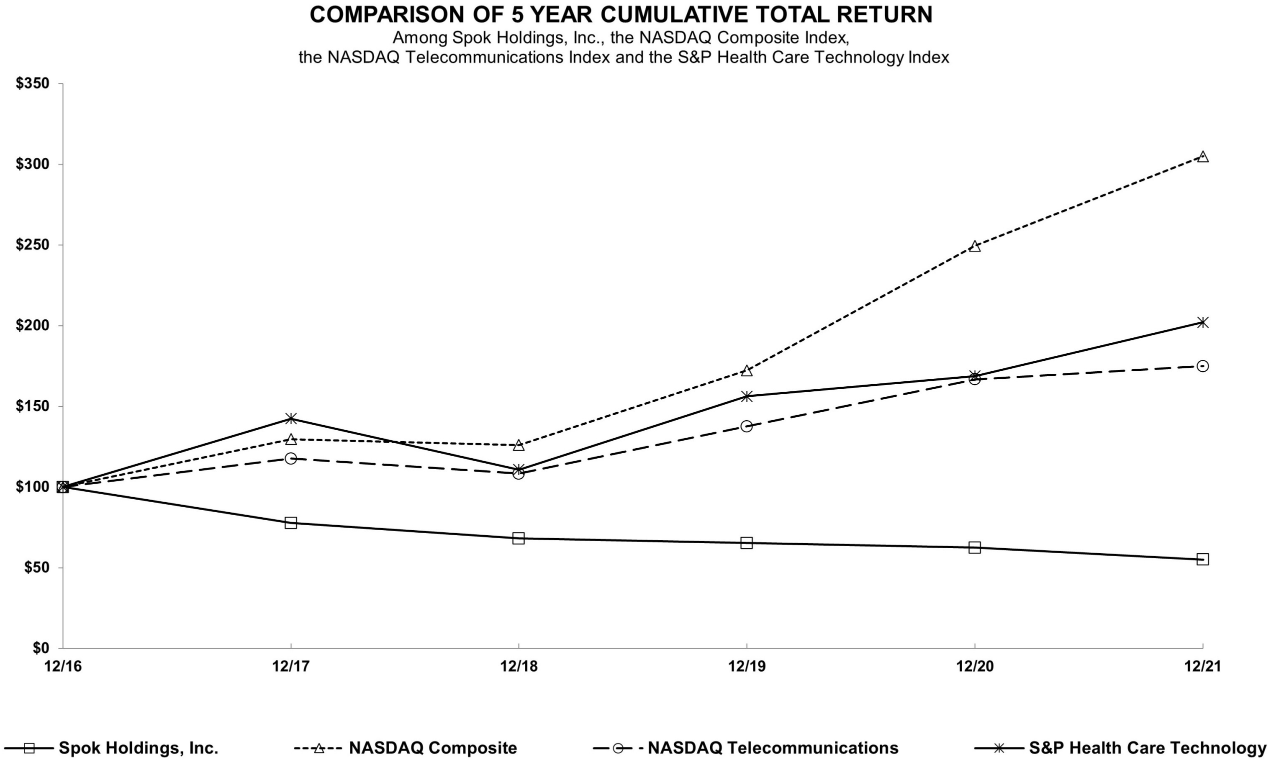
(1) The total payment reflects the cash distributions paid in relation to common stock, vested RSUs and vested shares of restricted stock.
(2) The per share amount includes a special one-time dividend of $0.25 per share of common stock declared in 2016 but distributed to stockholders in 2017.

We expect to increase our quarterly dividends to $0.3125 per common share for each quarter in 2022, subject to declaration by the Board of Directors. On February 16, 2022, the Board of Directors declared a regular quarterly cash dividend of $0.3125 per share of common stock, with a record date of March 16, 2022, and a payment date of March 30, 2022. This cash dividend of approximately $6.2 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 of December 31, 2016, to December 31, 2021, 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 assumes that on December 31, 2016, $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, 2016, to December 31, 2021. The stock performance depicted on the chart represents historical stock performance and is not necessarily indicative of future stock price performance.



	December 31,					
	2016	2017	2018	2019	2020	2021
Spok Holdings, Inc.	$ 100.00	$ 77.66	$ 68.04	$ 65.20	$ 62.37	$ 55.03
NASDAQ Composite	100.00	129.64	125.96	172.17	249.51	304.85
NASDAQ Telecommunications	100.00	117.62	108.29	137.49	166.70	174.78
S&P Health Care Technology	100.00	142.26	110.70	156.11	168.77	202.07

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, 2021.

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 February 2022, the Company's Board of Directors authorized a share repurchase program of up to $10 million of the Company's common stock.

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, 2021, and 2020.

ITEM 6. *[RESERVED]*

ITEM 7. *MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF 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 in the Notes to the Consolidated Financial Statements), 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 offer a focused suite of unified clinical communication and collaboration solutions that include call center applications, clinical alerting and notifications, one-way and advanced two-way wireless messaging services, mobile communications and public safety solutions. 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 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. While our primary market has been the healthcare industry with a focus on prominent hospitals, our solutions can also be found in large government agencies; leading public safety institutions; colleges and universities; large hotels, resorts and casinos; and well-known manufacturers.

Revenue generated by wireless messaging services (including voice mail, personalized greetings, message storage and retrieval), equipment, maintenance plans and/or equipment loss 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.

New Strategic Business Plan

In February 2022, our Board of Directors announced a new strategic business plan that includes a restructuring of our business to discontinue Spok Go, eliminate all associated costs and optimize the Company's existing structure to drive continued cost improvement. The strategic business plan includes a renewed focus on our existing and established business, including the Spok Care Connect Suite and our wireless service offerings. While there are numerous factors that went into this decision, the ongoing challenge of the COVID-19 pandemic made it difficult for the Spok Go platform to gain sufficient traction with customers or for our business to continue operating with our current level of costs and personnel. This shift in focus will allow us to prioritize cash flow generation and the return of capital to stockholders. As a result of this new strategic business plan, our Board of Directors has increased the regular quarterly dividend from $0.125 to $0.3125 and has authorized a share repurchase program of up to $10 million of our common stock.

As part of the restructuring program, we intend to eliminate approximately 175 positions, primarily in research and development, but also in professional services, selling and marketing, and back-office support functions. We expect to record one-time pre-tax restructuring charges of approximately $6.4 million to $10.2 million, comprised of approximately $5.0 million to $6.6 million in severance and personnel related costs and approximately $1.4 million to $3.6 million in contractual terminations. Future cash payments related to these charges are expected to generally be within the same range. The restructuring actions associated with these charges are expected to be substantially complete in 2022.

COVID-19

In March 2020, the World Health Organization declared COVID-19 a global pandemic, and the virus significantly impacted the global economy. Although federal and state restrictions were not widely adopted until late in the first quarter of 2020, we began to experience a direct impact on our sales cycle in late February 2020 as hospitals began to delay purchasing decisions and address staff reductions. These delays continued to affect our software bookings, which directly impacted license and equipment revenues during 2020 and 2021.

We also experienced delays in our ability to deliver on-site implementation services, which has impacted our services revenue since the onset of the pandemic. While much of our implementation process can be performed remotely, the on-premise nature of certain of our solutions requires some level of on-site availability to completely implement. These impacts primarily resulted in delays in the timing of revenue recognition during 2020 and 2021, as associated revenue corresponds to our backlog of performance obligations ready for delivery at some point in the future.

While many hospitals relaxed their initial capacity and social distancing guidelines in the second half of 2020, some of our customers continued such restrictions into 2021 to ensure the safety of their personnel and patients. Such restrictions, which have varied considerably depending on the size of the organization, geographical location and local regulations, can make it difficult for external personnel who are not critical to the immediate operating needs of a hospital, such as our implementation staff, to gain access.

As we return to normal operating levels, much of our business continues to be driven by our customers and their ability to resume operations beyond providing just critical needs and emergency services. Many hospitals initially reduced the number of elective surgeries as a result of government restrictions, as well as patients delaying or canceling elective procedures during the pandemic. While most organizations began to see improved operating levels during the second half of 2020 and into 2021 as the number of overall U.S. virus cases declined, some of our customers in certain geographic areas continued to experience periodic capacity constraints due to the emergence of new COVID-19 variants.

The length and severity of pandemic-related challenges affecting our customer base remain uncertain, and we continue to monitor new COVID-19 variants of concern that may indicate risks of increased transmission and more severe disease. Any significant spikes in U.S. virus cases could delay or reverse progress towards returning to normal operational levels. With continued distribution of effective vaccines, however, we are optimistic that spikes in virus cases will be mitigated and that our customers' operating levels will continue to improve as pandemic-related restrictions are lifted.

While we are likely to see some lingering and continued effects from COVID-19, barring the emergence of a severe COVID-19 variant of concern, which might have significant negative effects on the overall economy and our customer base specifically, we anticipate a return to pre-pandemic operating levels in 2022. Since the fourth quarter of 2020, we have seen modest improvements in each of the aforementioned areas impacted by the pandemic, and we remain cautiously optimistic that we will continue seeing sequential improvement in these areas over the next several quarters. Likewise, we are optimistic that any lingering effects from COVID-19 will have a lesser impact on our financial results in 2022 than they did in 2020 and 2021.

As facts and circumstances continue to evolve over the coming months, we will continue to assess and communicate the anticipated impact on our business, and we will continue to diligently pursue countermeasures to prudently manage operating expenses and liquidity during this time, with a goal of neutralizing the impact of the pandemic on our cash flows. Each of these measures is described in further detail below and is subject to actual operating conditions experienced during the year.

- **Reduced Work Schedules:** We enacted a Company-wide plan that reduced work schedules, resulting in a temporary reduction in compensation expenses during the second, third and fourth quarters of 2020 and continuing for the first half of 2021, whereby each of our employees, including our executive officers, was subject to one to two weeks of a reduced work schedule per quarter. For the years ended December 31, 2021 and 2020, these reduced work schedules resulted in realized savings of $1.8 million and $5.6 million in compensation expense, respectively. While we originally expected this plan to continue for all of 2021, we subsequently concluded that continuing the plan for the second half of the year was unnecessary given our positive results during the first half of the year, as well as management's confidence in mitigating short-term uncertainties with regard to the pandemic.
- **Equity in Lieu of Cash Compensation:** We also enacted a plan for the first three quarters of 2021 whereby qualified employees received a portion of their compensation in the form of shares of the Company's common stock in lieu of cash. These awards, which affected approximately 450 of our employees, were made in advance on a quarterly basis and vested immediately. While we originally expected this plan to continue for all of 2021, we subsequently concluded that continuing the plan for the fourth quarter of 2021 was unnecessary, for the same reasons as explained above. For the year ended December 31, 2021, we achieved cash savings of $1.9 million.
- **Non-Employee Director Alternative DSU or Restricted Stock Plan:** Since inception of this alternative payment plan, which began in the third quarter of 2020, all non-employee directors have voluntarily elected to receive either DSUs or restricted stock in lieu of the entire cash portion of their compensation. As a result, for the year ended December 31, 2021, we achieved cash savings of $0.3 million. We do not anticipate any further savings from this plan. (Refer to Note 9, "Stockholders' Equity," in the Notes to Consolidated Financial Statements for further detail related to the alternative DSU or restricted stock plan).

As we continue to see improvements in our operating levels, we are confident that the need to mitigate cash flow impacts through direct expense management will also continue to decline. While the Company has no plans to resume its countermeasures, we anticipate re-evaluating our position on a quarterly basis based on the progression of COVID-19 and any variants of concern, impacts on our business, and other facts and circumstances as deemed relevant by management.

2021 Highlights

Total revenue declined by $6.0 million or 4.1% during 2021 compared to 2020, primarily as a result of the continued and expected decline in wireless revenue.

The wireless revenue attrition rate in 2021 was 5.7%, an increase from a 5.2% attrition rate in 2020. This increase was driven by product and other revenue which is highly variable. The attrition rate within recurring paging revenue categories was 5.1% as compared to an attrition rate of 6.1% in both 2020 and 2019.

For the year ended December 31, 2021 we recognized impairment charges of $15.7 million pertaining to capitalized software development, and for the year ended December 31, 2020, we recognized impairment charges of $25.0 million pertaining to goodwill. Excluding these impairment charges, our operating expenses increased by $8.4 million or 5.7% during 2021 compared to 2020, driven primarily by the 2021 curtailment of the pandemic-related cost mitigation measures that we enacted in 2020, as discussed above, our utilization of certain provisions under The Coronavirus Aid Relief and Economic Security ("CARES") Act in 2020 that were not available in 2021, and costs related to our strategic alternatives review.

We returned approximately $10.0 million of capital to stockholders in the form of cash dividends.

Results of Operations

The following table is a summary of our Consolidated Statements of Operations for the years ended December 31, 2021, 2020 and 2019 and the discussion that follows compares the year ended December 31, 2021 to the year ended December 31, 2020. For a discussion and analysis of the year ended December 31, 2020, compared to the year ended December 31, 2019, please refer to Management's Discussion and Analysis of Financial Condition and Results of Operations included in Part II, Item 7 of our Annual Report on Form 10-K for the year ended December 31, 2020, filed with the SEC on February 18, 2021:

(Dollars in thousands)	2021	Change		2020	Change		2019
Revenue:							
Wireless revenue	$ 78,826	(4,767)	(5.7)%	$ 83,593	$ (4,574)	(5.2)%	$ 88,167
Software revenue	63,327	(1,260)	(2.0)%	64,587	(7,535)	(10.4)%	72,122
Total revenue	142,153	(6,027)	(4.1)%	148,180	(12,109)	(7.6)%	160,289
Operating expenses:							
Cost of revenue (exclusive of items shown separately below)	32,574	1,219	3.9 %	31,355	(1,226)	(3.8)%	32,581
Research and development	17,920	2,092	13.2 %	15,828	(11,715)	(42.5)%	27,543
Technology operations	29,247	(596)	(2.0)%	29,843	(1,585)	(5.0)%	31,428
Selling and marketing	20,168	701	3.6 %	19,467	(3,703)	(16.0)%	23,170
General and administrative	43,853	3,564	8.8 %	40,289	(2,989)	(6.9)%	43,278
Depreciation, amortization and accretion	10,446	1,390	15.3 %	9,056	(193)	(2.1)%	9,249
Goodwill and capitalized software development impairment	15,663	(9,344)	(37.4)%	25,007	16,158	182.6 %	8,849
Total operating expenses	169,871	(974)	(0.6)%	170,845	(5,253)	(3.0)%	176,098
Operating loss	(27,718)	(5,053)	22.3 %	(22,665)	(6,856)	43.4 %	(15,809)
Interest income	320	(367)	(53.4)%	687	(964)	(58.4)%	1,651
Other income	66	(142)	(68.3)%	208	(527)	(71.7)%	735
Loss before income taxes	(27,332)	(5,562)	25.5 %	(21,770)	(8,347)	62.2 %	(13,423)
Benefit from (provision for) income taxes	5,152	27,607	(122.9)%	(22,455)	(25,113)	(944.8)%	2,658
Net loss	$ (22,180)	$ 22,045	(49.8)%	$ (44,225)	$ (33,460)	310.8 %	$ (10,765)
Supplemental Information							
FTEs	563	(39)	(6.5)%	602	(36)	(5.6)%	638
Active transmitters	3,468	(178)	(4.9)%	3,646	(194)	(5.1)%	3,840

Revenue

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

We develop, sell and support enterprise-wide systems for healthcare, government, large enterprise and other organizations needing to automate, centralize and standardize their approach to clinical communications and collaboration. 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 is the healthcare industry, particularly hospitals. While we have historically identified hospitals with 200 or more beds as the primary targets for our software solutions, as well as our paging services, we have recently expanded our focus to include smaller hospitals with shorter sales cycles, including academic medical centers.

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

Refer to Note 4, "Revenue, Deferred Revenue and Prepaid Commissions," in the Notes to Consolidated Financial Statements for additional information on our wireless and software revenue streams.

The table below details total revenue for the periods stated:

(Dollars in thousands)	2021	Change		2020	Change		2019
Wireless revenue:							
Paging revenue	$ 75,845	$ (4,071)	(5.1)%	$ 79,916	$ (5,151)	(6.1)%	$ 85,067
Product and other revenue	2,981	(696)	(18.9)%	3,677	577	18.6 %	3,100
Wireless revenue	78,826	(4,767)	(5.7)%	83,593	(4,574)	(5.2)%	88,167
Software revenue:							
License	5,494	315	6.1 %	5,179	(3,771)	(42.1)%	8,950
Professional services	17,161	(749)	(4.2)%	17,910	(1,279)	(6.7)%	19,189
Hardware	2,267	(574)	(20.2)%	2,841	(777)	(21.5)%	3,618
Subscription	423	357	540.9 %	66	66	— %	—
Operations revenue	25,345	(651)	(2.5)%	25,996	(5,761)	(18.1)%	31,757
Maintenance	37,982	(609)	(1.6)%	38,591	(1,774)	(4.4)%	40,365
Software revenue	63,327	(1,260)	(2.0)%	64,587	(7,535)	(10.4)%	72,122
Total revenue	$ 142,153	$ (6,027)	(4.1)%	$ 148,180	$ (12,109)	(7.6)%	$ 160,289

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, sales of paging devices and charges for devices that are not returned and are net of anticipated credits. See Item 1. "Business" for more details.

We offer subscriptions to one-way or two-way messaging services for a periodic (monthly, quarterly, semiannual, 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. We also sell devices to resellers who lease or resell such devices to their subscribers and then sell messaging services utilizing our networks.

A subscriber to one-way messaging services may select coverage on a local, regional or nationwide basis to best meet their messaging needs, while two-way messaging is generally offered on a nationwide basis. In addition, subscribers either contract to use a messaging device that we own and provide for an additional fixed monthly fee or they own the device used, after either purchasing it either from us or from another vendor.

We offer exclusive one-way (T5) and two-way (T52) alphanumeric pagers, which are configurable to support unencrypted 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 . We also 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.

The decrease in wireless revenue during 2021 compared to 2020 reflects the secular decrease in demand for our wireless services. Wireless revenue is generally reflective of the number of units in service and measured monthly as 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.

For the year ended December 31, 2021, ARPU was $7.30, unchanged from the prior year. Total units in service were 0.8 million and 0.9 million as of December 31, 2021, and 2020, respectively. Overall ARPU remained steady as compared to the prior year as the decrease from lower variable revenue and the anticipated decline in service revenue was offset by revenue from the Telecommunications Relay Service Charge ("TRS") which we began to recover from customers in 2021, as well as general increases of Universal Service Fees ("USF"). USF and TRS fees are effectively pass-through items that have corresponding costs associated with them. Excluding these pass-through items, ARPU would have declined in-line with historical trends.

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 optimistic 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 narrowband wireless service offerings to broadband 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:	
(Units and Dollars in Thousands)	2021	2020	Change	2021	2020	Change	ARPU	Units
Paging revenue	847	885	(38)	$ 75,845	$ 79,916	$ (4,071)	$ (86)	$ (3,985)

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.

In late 2021, we began offering our newest pager, GenA. This one-way alphanumeric pager features a high resolution ePaper display, intuitive modern user interface, advanced encryption and security features, over-the-air remote programming, and an antimicrobial housing. Users can select from various font sizes, and the large GenA display also leverages proportional fonts to maximize key information on a single screen.

The GenA pager is the only product available on the market with these capabilities, and we maintain an exclusive arrangement with the product's manufacturer. Given the product differentiation of the GenA pager, its development is a key initiative providing a competitive advantage, and we expect this new technology will be popular for our customers in clinical environments and may help slow our wireless revenue attrition.

Software Revenue

Software revenue consists of two components: operations revenue and maintenance revenue. Operations revenue consists primarily of license and subscription 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 generated from our ongoing support of our software solutions or related equipment, typically for a period of one year after project completion.

To a large degree, software revenue corresponds to our backlog of performance obligations ready to deliver at some point in the future, and any delays in implementation may affect the timing of revenue recognition. Our software projects generally originate from fixed-bid contracts, although many involve a protracted sales cycle and may result in unforeseen complexity and deviation from original scope. The time needed to complete projects, therefore, may not align with our original expectations, which affects our backlog. As a result, software revenue may fluctuate on a short-term basis, and we generally evaluate longer-term trends when managing this business.

Revenue items impacted by timing generally relate to specific renewal contracts that do not have auto-renewal terms and for which we must negotiate at the end of each term. We are generally precluded from recognizing revenue on these contracts until new terms have been agreed to even though we continue to provide maintenance service for these customers while negotiations are ongoing. While certain commercial customers require this type of contract renewal, these contracts are generally limited to government organizations, including federal, state and local entities. When a renewal of this nature has been contracted, it is often accompanied by several months of "catch-up" revenue from services performed in past periods resulting in a one-time value that is greater than the normal monthly revenue expected over the life of the remaining term.

While we have not seen a meaningful increase in our normal customer churn as it relates to maintenance revenue, our ability to replace this churn with new revenues will not likely replicate what we have accomplished historically nor do we expect to fully offset this with annual increases of our existing base. Given these dynamics, we believe annual maintenance revenue is likely to be relatively flat or slightly down as we move forward, until such time that we are able t to develop new licenses that can provide an avenue for additional maintenance revenue.

During 2021, we continued to experience disruptions to our business due to the COVID-19 pandemic, however we believe that such disruptions will subside in 2022 and that our software revenues will resume their pre-pandemic growth.

Operations Revenue

Software operations revenue decreased during 2021 when compared to 2020. Service revenue declined largely as a result of employing fewer billable FTE's in 2021 as compared to 2020. Like many other companies, we experienced relatively high personnel attrition and slower time-to-hire rates given the macroeconomic environment in 2021. The decline in services revenue was partially offset by an increase in license and subscription revenues overall, given an improving economy and selling environment when compared to the prior year and the early stages of the pandemic.

Maintenance Revenue

Software maintenance revenue decreased during 2021 when compared to 2020. Current trends in revenue churn rates remain relatively stable and are in line with historical trends. However, the deterioration of maintenance revenue from new license bookings has created an environment where churn is greater than the inflow of new revenue. Historically, this revenue churn had been offset by the growth in our license sales.

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 we incur for the delivery of products and services to our customers and consist primarily of hardware, third-party software, outside services 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. Research and development expenses exclude any development costs that qualify for capitalization.
- **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 we continue to consolidate our networks, although the benefits of such network rationalization efforts and resulting costs savings will continue to decline.
- **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 maintain a centralized marketing function, that 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, including 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.
- **Depreciation, Amortization and Accretion.** These are expenses that may be associated with one or more of the aforementioned functional categories. This classification generally consists of depreciation from capital expenditures or other assets that are core to our ongoing operations, amortization of intangible assets, amortization of capitalized software development costs, and accretion of asset retirement obligations.

The following is a review of our operating expense categories for the years ended December 31, 2021, and 2020.

Cost of Revenue

Cost of revenue consisted primarily of the following items:

(Dollars in thousands)	2021	Change		2020	Change		2019
Payroll and related	$ 21,224	$ 700	3.4 %	$ 20,524	$ 523	2.6 %	$ 20,001
Cost of sales	8,881	227	2.6 %	8,654	(1,680)	(16.3)%	10,334
Stock-based compensation	1,008	471	87.7 %	537	270	101.1 %	267
Other	1,461	(179)	(10.9)%	1,640	(339)	(17.1)%	1,979
Total cost of revenue	$ 32,574	$ 1,219	3.9 %	$ 31,355	$ (1,226)	(3.8)%	$ 32,581
FTEs	189	(7)	(3.6)%	196	(6)	(3.0)%	202

Cost of revenue increased for the year ended December 31, 2021, compared to December 31, 2020, driven by increases in payroll and related expenses, stock-based compensation, and cost of sales.

Despite the decline in FTE's, payroll and related costs increased as we recognized lower cost savings from reduced work schedules during the year. Additionally, payroll and related costs were lower in 2020 relative to historical trend and normal operating costs as a result of our utilization of certain provisions under the CARES Act for payroll and employee taxes last year that were not available in 2021. Stock-based compensation increased as a result of our plan to provide a portion of compensation for certain employees in the form of shares of the Company's common stock in lieu of cash, which was effective for the first three quarters of 2021. These temporary cash savings measure are outlined in more detail within our earlier discussion on COVID-19.

Cost of sales increased largely due to an increase in recoverable taxes and regulatory fees associated with our wireless revenue, offset by lower equipment costs. The Company reclassified $3.3 million from general and administrative to cost of sales for the year ended December 31, 2021. Corresponding reclassifications of $2.8 million and $2.5 million were made to the Consolidated Statement of Operations for presentation purposes for the years ended December 31, 2020, and 2019, respectively.

Research and Development

Research and development consisted primarily of the following items:

(Dollars in thousands)	2021	Change		2020	Change		2019
Payroll and related	$ 17,428	$ 47	0.3 %	$ 17,381	$ (1,659)	(8.7)%	$ 19,040
Outside services	7,856	(2)	— %	7,858	432	5.8 %	7,426
Capitalized software development	(10,842)	410	(3.6)%	(11,252)	(11,252)	— %	—
Stock-based compensation	1,449	484	50.2 %	965	655	211.3 %	310
Other	$ 2,029	1,153	131.6 %	$ 876	109	14.2 %	$ 767
Total research and development	$ 17,920	$ 2,092	13.2 %	$ 15,828	$ (11,715)	(42.5)%	$ 27,543
FTEs	102	(19)	(15.7)%	121	(11)	(8.3)%	132

Research and development expenses increased for the year ended December 31, 2021, compared to 2020, driven by higher stock-based compensation, and lower capitalized software development costs, and higher other expenses.

Stock-based compensation increased as a result of our plan to provide a portion of compensation for certain employees in the form of shares of the Company's common stock in lieu of cash, which was effective for the first three quarters of 2021. Our temporary cash savings measures are outlined in more detail within the earlier discussion on COVID-19. Although payroll and related expenses within each of our other functional categories increased during 2021, as explained in more detail in those sections, Research and Development payroll costs were essentially flat for the year due to the decline in FTEs within the category.

We capitalized fewer costs related to software development due to fewer FTE's in 2021, as well as reduced spending on outside services. Refer to Note 1, "Organization and Significant Accounting Policies," and Note 7, "Goodwill, Capitalized Software Development and Intangible Assets, Net," in the Notes to Consolidated Financial Statements for further detail.

The increase in other expenses was driven by a $0.9 million loss contingency we recorded in the fourth quarter of 2021 related to a license and service contract from which we do not believe we will be able to realize any benefits. Due to a change in standards required for electronic heath records, we no longer need the product enhancements that would be provided under this contract. Refer to Note 11, "Commitments and Contingencies," in the Notes to Consolidated Financial Statements for further detail.

While development costs have continued to grow, they have done so at a slower pace when compared to prior years. We will continue to focus on the development efforts of our software solutions and intend to maintain these efforts based on their importance to our continued success, however these efforts will be targeted to specific enhancements. Total research and development costs are expected to significantly decrease in 2022 as part of our new strategic business plan and our intent to eliminate all Spok Go related costs.

Technology Operations

Technology operations consisted primarily of the following items:

(Dollars in thousands)	2021	Change		2020	Change		2019
Payroll and related	$ 9,959	$ 322	3.3 %	$ 9,637	$ (1,151)	(10.7)%	$ 10,788
Site rent	12,565	(1,013)	(7.5)%	13,578	(137)	(1.0)%	13,715
Telecommunications	3,316	(452)	(12.0)%	3,768	(290)	(7.1)%	4,058
Stock-based compensation	459	269	141.6 %	190	67	54.5 %	123
Other	2,948	278	10.4 %	2,670	(74)	(2.7)%	2,744
Total technology operations	$ 29,247	$ (596)	(2.0)%	$ 29,843	$ (1,585)	(5.0)%	$ 31,428
FTEs	86	(2)	(2.3)%	88	(4)	(4.3)%	92

Technology operations expenses decreased for the year ended December 31, 2021, compared to 2020, driven by lower site rent and by lower telecommunications costs, which resulted from cost savings initiatives applicable to our wireless network. These declines were partially offset by higher payroll and related and stock-based compensation costs.

The number of active transmitters, which directly affects our site rent expenses, declined 4.9% from December 31, 2020, to December 31, 2021. 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 may be unable to continue our efforts to rationalize and consolidate our networks.

Payroll and related expenses increased as we recognized lower cost savings from reduced work schedules during 2021 as compared to 2020. Additionally, payroll and related costs were lower in 2020 relative to historical trend and normal operating costs as a result of our utilization of certain provisions under the CARES Act for payroll and employee tax credits in 2020 that were not available in 2021. Refer to Note 10, "Income Taxes," in the Notes to Consolidated Financial Statements for additional information on our temporary use of the CARES Act provisions. Stock-based compensation increased as a result of our plan to provide a portion of compensation for certain employees in the form of shares of the Company's common stock in lieu of cash, which was effective for the first three quarters of 2021. Our temporary cash savings measures are outlined in more detail within the earlier discussion on COVID-19.

Selling and Marketing

Selling and marketing consisted primarily of the following items:

(Dollars in thousands)	2021	Change		2020	Change		2019
Payroll and related	$ 12,812	$ 1,006	8.5 %	$ 11,806	$ (1,702)	(12.6)%	$ 13,508
Commissions	4,426	125	2.9 %	4,301	(693)	(13.9)%	4,994
Stock-based compensation	897	130	16.9 %	767	177	30.0 %	590
Advertising and events	1,565	(69)	(4.2)%	1,634	(1,692)	(50.9)%	3,326
Other	468	(491)	(51.2)%	959	207	27.5 %	752
Total selling and marketing	$ 20,168	$ 701	3.6 %	$ 19,467	$ (3,703)	(16.0)%	$ 23,170
FTEs	86	(12)	(12.2)%	98	(7)	(6.7)%	105

Selling and marketing expense increased for the year ended December 31, 2021, compared to 2020, driven by increases in payroll and related expenses and stock-based compensation, partially offset by a decline in other expenses.

Payroll and related expenses increased as we recognized lower cost savings from reduced work schedules during the year compared to 2020. Additionally, payroll and related costs were lower in 2020 relative to historical trends and normal operating costs as a result of our utilization of certain provisions under the CARES Act for payroll and employee tax credits in 2020 that were not available in 2021. Refer to Note 10, "Income Taxes," in the Notes to Consolidated Financial Statements for additional information on our temporary use of the CARES Act provisions. Furthermore, the significant decrease in FTE's largely occurred during the second half of 2021 and payroll and related costs do not reflect full annualized savings. Stock-based compensation increased as a result of our plan to provide a portion of compensation for certain employees in the form of shares of the Company's common stock in lieu of cash. The reduced work schedules and share compensation plan were part of our temporary cash savings measures, outlined in more detail within the earlier discussion on COVID-19.

The decline in other expenses was primarily driven by savings from precautionary COVID-19 measures whereby we did not hold our annual offsite event for recognition of outstanding employees, and we held virtual internal sales training and conferences in lieu of in-person training.

General and Administrative

General and administrative consisted primarily of the following items:

(Dollars in thousands)	2021	Change		2020	Change		2019
Payroll and related	$ 15,333	$ 995	6.9 %	$ 14,338	$ (2,034)	(12.4)%	$ 16,372
Stock-based compensation	3,426	377	12.4 %	3,049	696	29.6 %	2,353
Facility rent, office and technology costs	10,235	1,219	13.5 %	9,016	(83)	(0.9)%	9,099
Outside services	9,514	1,703	21.8 %	7,811	(626)	(7.4)%	8,437
Taxes, licenses and permits	1,047	719	219.2 %	328	(835)	(71.8)%	1,163
Bad debt	660	(391)	(37.2)%	1,051	382	57.1 %	669
Other	3,638	(1,058)	(22.5)%	4,696	(489)	(9.4)%	5,185
Total general and administrative	$ 43,853	$ 3,564	8.8 %	$ 40,289	$ (2,989)	(6.9)%	$ 43,278
FTEs	100	1	1.0 %	99	(8)	(7.5)%	107

General and administrative expenses increased for the year ended December 31, 2021, compared to 2020, driven by increases in outside services, facility rent, office and technology costs, payroll and related costs, taxes, licenses and permits,, and stock-based compensation. These increases were partially offset by decreases in bad debt and other expenses.

Outside services increased primarily due to the use of professional services in connection with our strategic alternatives review, which we announced on September 3, 2021. The increase in facility rent, office and technology costs was primarily due to higher expenses for software, hardware and IT related costs as well as increased rent for our headquarters lease. Refer to Note 5, "Leases," in the Notes to Consolidated Financial Statements for additional information on our headquarters lease.

Payroll and related costs increased as we recognized lower cost savings from reduced work schedules during the year as compared to 2020. The increase in stock-based compensation was due to our plan to provide a portion of compensation for certain employees in the form of shares of the Company's common stock in lieu of cash, which was effective for the first three quarters of 2021. These temporary cash savings measures are outlined in more detail within our earlier discussion on COVID-19.

The increases in taxes, licenses and permits was due in large part to temporary reductions in certain usage taxes in 2020 that were not incurred in 2021. Furthermore, we reclassified $3.3 million from taxes, licenses and permits to cost of revenue for the year ended December 31, 2021. Corresponding reclassifications of $2.8 million and $2.5 million were made to the Consolidated Statement of Operations for presentation purposes for the years ended December 31, 2020, and 2019, respectively. These reclassification were related to the recoverable taxes and regulatory fees associated with our wireless revenue.

Depreciation, Amortization and Accretion

For the year ended December 31, 2021, compared to 2020, depreciation, amortization and accretion expenses increased by $1.4 million. Amortization expense increased by $2.2 million for the year due to an increase in amortization of software development costs. This was partially offset by a $1.0 million decline in depreciation expenses for the year, largely due to lower depreciation for paging equipment, including a large purchase of pagers becoming fully depreciated in 2021. Refer to Note 6, "Consolidated Financial Statement Components," in the Notes to Consolidated Financial Statements for further discussion.

Goodwill and Long-Lived Asset Impairment

We perform our annual goodwill impairment testing in the fourth quarter of each year. For the year ended December 31, 2021, we recognized no goodwill impairment. For the year ended December 31, 2020, we recognized a non-cash, pre-tax goodwill impairment charge of $25.0 million.

We evaluate our long-lived assets for impairment whenever events or changes in circumstances indicate that the carrying amount of the asset group may not be recoverable. For the year ended December 31, 2021, we recognized a capitalized software development impairment charge of $15.7 million. For the year ended December 31, 2020, we recognized no capitalized software development impairment.

Refer to Note 1, "Organization and Significant Accounting Policies," and Note 7, "Goodwill, Capitalized Software Development and Intangible Assets, Net" in the Notes to Consolidated Financial Statements for further discussion.

Interest Income, Other Income (Expense) and Income Tax (Benefit) Expense

Interest Income

Interest income decreased by $0.4 million for the year ended December 31, 2021, compared to 2020, primarily due to a decrease in interest earned on the Company's cash balances and short-term investments. This was driven by lower interest rates during the year.

Other Income

For the year ended December 31, 2021, compared to 2020, other income decreased by $0.1 million, largely as a result of a decrease in gains on foreign currency.

Provision for (Benefit from) Income Taxes

The effects of foreign taxes are immaterial for all periods presented. The following provides the effective tax rate reconciliation for the years ended December 31, 2021, 2020 and 2019, respectively (See Note 10, "Income Taxes" in the Notes to Consolidated Financial Statements for further discussion on our income taxes):

(Dollars in thousands)	2021		2020		2019	
Loss before income taxes	$ (27,332)		$ (21,770)		$ (13,423)	
Income taxes computed at the federal statutory rate	$ (5,740)	21.0 %	$ (4,572)	21.0 %	$ (2,819)	21.0 %
State income taxes, net of federal benefit	(1,513)	5.5 %	(703)	3.2 %	(567)	4.2 %
Goodwill impairment	—	— %	6,341	(29.1)%	2,243	(16.7)%
Change in valuation allowance	2,070	(7.6)%	22,108	(101.6)%	—	— %
Research and development and other tax credits	(808)	3.0 %	(1,316)	6.0 %	(1,790)	13.3 %
Excess executive compensation	272	(1.0)%	266	(1.2)%	322	(2.4)%
Other	567	(2.1)%	331	(1.5)%	(47)	0.4 %
(Benefit from) provision for income taxes	$ (5,152)	18.8 %	$ 22,455	(103.1)%	$ (2,658)	19.8 %

Benefit from income taxes changed by $27.6 million for the year ended December 31, 2021, from 2020 due primarily to the deferred tax asset valuation allowance and goodwill impairment in 2020 that did not occur in 2021. 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.

We assess the recoverability of our deferred income tax assets, which represent the tax benefits of future tax deductions, based on available positive and negative evidence, and 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" (meaning a probability of greater than 50%) that all or some portion of our deferred income tax assets will be realized in future periods.

The cumulative loss incurred by the Company over the three-year period ended December 31, 2021, constitutes a piece of objective negative evidence that limits our ability to consider other subjective evidence. In addition, the uncertainty created by COVID-19 has significantly limited our ability to consider our projections for future profitability and growth in our assessment of the recoverability of our deferred income tax assets. We traditionally perform this evaluation in the fourth quarter of each year, utilizing our annual long-range planning and forecasting updates. As of December 31, 2021, and 2020, our deferred tax assets were net of valuation allowances of $24.2 million and $22.1 million, respectively. COVID-19 has significantly limited our ability to consider projections for future profitability as objectively verifiable positive evidence to support the realizability of deferred tax assets. As a result, we continue to maintain a valuation allowance against deferred tax assets associated with net operating losses and credits with set expiration dates.

Those deferred income tax assets which are not currently covered by a valuation allowance are those that are indefinite-lived, or whose temporary differences would reverse in the future and may result in the creation of an indefinite-lived deferred income tax asset, which we consider to be realized through future taxable income despite near term uncertainties. The amount of deferred income tax assets considered realizable, however, could be adjusted in the future if objective negative evidence in the form of cumulative losses is no longer present, additional weight is given to subjective evidence such as our projections for future profitability and growth, or other relevant factors arise. We did not record a valuation allowance in 2019.

Refer to Note 1, "Organization and Significant Accounting Policies," and Note 10, "Income Taxes," in the Notes to Consolidated Financial Statements for further discussion.

Liquidity and Capital Resources

Cash and Cash Equivalents

At December 31, 2021, we held cash, cash equivalents and short-term investments of $59.6 million. The available cash and cash equivalents consist of cash in our operating accounts and cash invested in interest-bearing funds managed by third-party financial institutions. These funds invest in U.S. Treasury securities and are therefore classified as held-to-maturity and reported at amortized cost in our Consolidated Balance Sheets. 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. 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 Condensed Consolidated Balance Sheets.

We maintain a level of liquidity sufficient to allow us to meet our cash needs in both the short term (next 12 months) and long term (beyond 12 months). At any point in time, we maintain approximately $5.0 to $10.0 million in our operating accounts at 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 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. As part of the restructuring program in connection with our new strategic business plan, we expect to record one-time pre-tax restructuring charges of approximately $6.4 million to $10.2 million, comprised of approximately $5.0 million to $6.6 million in severance and personnel related costs and approximately $1.4 million to $3.4 million in contractual terminations. Future cash payments related to these charges are expected to generally be within the same range. The restructuring actions associated with these charges are expected to be substantially complete in 2022. Because of these cash payments related to the restructuring program, we anticipate that our cash on hand will decrease during 2022. However, our restructuring efforts are meant to refocus our operational efforts towards cash flow generation and the return of capital to our stockholders. Should our restructuring efforts be successful, we anticipate future operating periods will return to historically positive cash flow generation.

On February 16, 2022, the Board of Directors declared an increase in the regular quarterly cash dividend to $0.3125 per share of common stock, with a record date of March 16, 2022, and a payment date of March 30, 2022. This cash dividend of approximately $6.2 million is expected to be paid from available cash on hand. The Board of Directors also authorized a share repurchase program of up to $10 million of the Company's common stock.

Cash Flows Overview

In response to COVID-19, management enacted certain temporary cost mitigation measures, as previously discussed. While we have previously discussed the impact on our revenues from the pandemic, we do not expect COVID-19 will have a material impact on our liquidity given our ability to reduce costs further, if necessary.

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 repurchase shares of our common stock under the share repurchase program, 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 that net cash provided by operating activities, together with the available cash on hand at December 31, 2021, should be adequate to meet anticipated cash requirements for the short term (next 12 months) and long term (beyond 12 months).

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,		
(Dollars in thousands)	**2021**	**2020**	**2019**
Net cash provided by operating activities	$ 7,968	$ 26,163	$ 11,693
Net cash used in investing activities	(225)	(14,571)	(30,222)
Net cash used in financing activities	(11,753)	(10,373)	(17,153)

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.

For the year ended December 31, 2021, net cash provided by operating activities was $8.0 million. This decline was driven by the net loss of $22.2 million, the deferred income tax benefit of $5.5 million, and changes in deferred revenue of $3.4 million and accounts payable, accrued liabilities and other of $0.7 million. These declines were partially offset by non-cash items such as capitalized software development impairment of $15.7 million, depreciation, amortization and accretion of $10.4 million, stock-based compensation of $7.2 million, and the provision for credit losses, service provisions and other of $1.2 million, as well as changes in prepaid expenses and other assets of $2.6 million, accounts receivable of $1.8 million, and lease liability of $0.8 million.

For the year ended December 31, 2020, net cash provided by operating activities was $26.2 million, due primarily to non-cash items such as goodwill impairment of $25 million, valuation allowance of $22.1 million, depreciation, amortization and accretion of $9.1 million, stock-based compensation of $5.5 million, and other non-cash items of $1.8 million, partially offset by the 2020 net loss of $44.2 million. Cash provided by operating activities also increased resulting from changes in accounts payable, accrued liabilities and other of $3.8 million, deferred revenue of $3.2 million and prepaid and other assets of $1.4 million, partially offset by a change in accounts receivable of $1.6 million.

Investing Activities

For the years ended December 31, 2021, and 2020, net cash used in investing activities was $0.2 million and $14.6 million, respectively, due primarily to the purchase and maturity of U.S. treasury securities, capital expenditures and capitalization of certain software development costs.

Financing Activities

For the years ended December 31, 2021, and 2020, net cash used in financing activities was $11.8 million and $10.4 million, respectively, primarily due to cash distributions to stockholders of $10.0 million and $9.8 million, respectively.

Commitments and Contingencies

In the ordinary course of our operations, we enter into certain contractual obligations. Such obligations include data processing services, operating leases for premises and equipment, agreements with respect to borrowed funds and deposit liabilities.

Purchase obligations are defined as agreements to purchase goods or services that are enforceable, legally binding, non-cancelable, 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 of such obligations 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.

Our contractual payment obligations for operating leases apply to leases for office space and transmitter locations. In March 2021, we relocated our corporate headquarters to office space located in Alexandria, Virginia, consisting of approximately 26,000 square feet of space under a lease that will expire on September 30, 2026. Over the life of this lease, cash payments are expected to total approximately $4.9 million.

The following table provides the Company's significant commitments and contractual obligations as of December 31, 2021:

	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	$ 15,624	6,217	$ 6,619	$ 2,599	$ 189
Unconditional purchase obligations	7,534	3,967	3,442	125	—
Total contractual obligations	$ 23,158	$ 10,184	$ 10,061	$ 2,724	$ 189

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.

The Company evaluates contingencies on an ongoing basis and establishes loss provisions for matters in which losses are probable and the amount of loss can be reasonably estimated. As part of this evaluation, the Company recognized a loss of $0.9 million in the fourth quarter of 2021 related to a license and service contract from which we do not believe we will realize any benefits. Due to a change in standards required for electronic heath records, we no longer need the product enhancements that would be provided under this contract.

Refer to Note 5, "Leases," and Note 11, "Commitments and Contingencies," in the Notes to Consolidated Financial statements for further discussion of commitments and contingencies.

Related Parties

Refer to Note 13, "Related Parties" in the Notes to Consolidated Financial Statements 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 Estimates

The Company’s accounting policies are more fully described in Note 1 of the Consolidated Financial Statements. As disclosed in Note 1, the preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions about future events that affect the amounts reported in the financial statements and accompanying notes. Actual results could differ significantly from those estimates. We believe that the following discussion addresses the Company’s most critical accounting estimates, which are those that involve a significant level of estimation uncertainty and have had or are reasonably likely to have a material impact on the Company’s financial condition and results of operations.

Revenue Recognition

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 and subscriptions 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.

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 as 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, maintenance, and subscription 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 that include wireless, maintenance, or subscription 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. 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.

Income Taxes

Deferred income tax assets and liabilities are calculated 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 assess the recoverability of our deferred income tax assets, which represent the tax benefits of future tax deductions, based on available positive and negative evidence and 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" (meaning a probability of greater than 50%) that all or some portion of our deferred income tax assets will be realized in future periods. We provide a valuation allowance when we consider it "more likely than not" that a deferred income tax asset will not be fully recovered. The assessment of our deferred income tax assets requires significant judgment, however, our methods, assumptions, and estimates used in assessing the need for a valuation allowance remained materially unchanged in 2021.

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

We are required to evaluate the carrying value of our goodwill, long-lived assets and intangible assets subject to amortization.

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. Significant judgment is required in the determination of a triggering event given the qualitative nature of the assessment. 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, if necessary. The estimated control premium is based on a review of current and past market information published by a third-party resource, assessment of the Company's future projected discounted cash flows and other relevant information if available. Our methods, assumptions, and estimates used in assessing goodwill in a quantitative form remained materially unchanged in 2021. We recorded no impairment of goodwill for the year ended December 31, 2021, and impairment of $25.0 million and $8.9 million for the years ended December 31, 2020, and 2019, respectively.

Quarterly, we assess whether circumstances exist which suggest that the carrying value of long-lived and amortizable intangible assets (asset groups) may not be recoverable. Similar to our quarterly assessment of goodwill, significant judgment is required in the determination of a triggering event given the qualitative nature of the assessment. During the quarter ended December 31, 2021, we determined that a triggering event had occurred based on a number of factors including a continuing trend of unsatisfactory Spok Go sales relative to our expectations, a significant accumulation of costs combined with a reduction of future sales projections which indicated continuing losses associated with Spok Go, and our expectation that Spok Go would not provide substantive future service potential.

We assessed recoverability based on the sum of the estimated undiscounted net cash flows of the long-lived asset group. The assessment of recoverability requires significant judgment, including timing and appropriateness of the estimated undiscounted future net cash flows. Given our lack of operational history with Spok Go, there is significant uncertainty in regards to an estimate of future cash flows. Our assessment determined that the carrying amount of the long-lived asset group was greater than the estimated undiscounted cash flows and further assessment of fair value was necessary to determine whether an impairment loss should be recognized.

We estimated fair value taking into consideration a number of factors including estimates used in our assessment of recoverability, discounted cash flow methods incorporating market-based information that we gathered as part of our on-going strategic alternatives process, and the projected continuance of costs necessary to create substantive future service potential. Given the nature of these capitalized software development costs where observable market prices are not readily available, the assessment of fair value requires significant judgment and estimates. This analysis determined that the remaining balance of capitalized software development costs had no fair value, and as a result, we recorded an impairment charge of $15.7 million for the year ended December 31, 2021. We did not record any impairment of long-lived assets or definite lived intangible assets for the years ended December 31, 2020, and 2019.

For additional details refer to Note 7, "Goodwill, Capitalized Software Development and Intangible Assets, Net," in the Notes to Consolidated Financial Statements.

Recent accounting pronouncements

Refer to Note 2, "Recent Accounting Standards," in the Notes to Consolidated Financial Statements for a summary of recent and pending accounting standards.

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

Interest Rate Risk

At December 31, 2021, 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, 2021.

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, 2021.

The effectiveness of our internal control over financial reporting as of December 31, 2021, has been audited by Grant Thornton LLP, an independent registered public accounting firm, as stated in its report which appears in this 2021 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, 2021, that have materially affected, or are reasonably likely to materially affect, the Company’s internal control over financial reporting**.**

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

None.

ITEM 9C. *DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS*

Not applicable.

PART III

Certain information called for by Items 10 through 14 is incorporated by reference from Spok's definitive Proxy Statement for our 2022 Annual Meeting of Stockholders, which will be filed with the SEC no later than May 2, 2022.

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 2022 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 2022 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 2022 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 2022 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 2022 Annual Meeting of Stockholders entitled "Board of Directors and Governance Matters."

ITEM 14*. PRINCIPAL ACCOUNTANT FEES AND SERVICES*

The information required by this item is incorporated by reference from the section of Spok's definitive Proxy Statement for our 2022 Annual Meeting of Stockholders entitled "Independent Registered Public Accounting Firm Fees."

PART IV

ITEM 15. *EXHIBIT AND 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 17, 2022

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 17, 2022
/s/ Michael W. Wallace Michael W. Wallace	Chief Financial Officer (principal financial officer)	February 17, 2022
/s/ Calvin C. Rice Calvin C. Rice	Chief Accounting Officer (principal accounting officer)	February 17, 2022
/s/ Royce Yudkoff Royce Yudkoff	Chairman of the Board	February 17, 2022
/s/ N. Blair Butterfield N. Blair Butterfield	Director	February 17, 2022
/s/ Dr. Bobbie Byrne Dr. Bobbie Byrne	Director	February 17, 2022
/s/Christine M. Cournoyer Christine M. Cournoyer	Director	February 17, 2022
/s/ Stacia A. Hylton Stacia A. Hylton	Director	February 17, 2022
/s/ Randy Hyun Randy Hyun	Director	February 17, 2022
/s/ Matthew Oristano Matthew Oristano	Director	February 17, 2022
/s/ Brett Shockley Brett Shockley	Director	February 17, 2022
/s/ Todd Stein Todd Stein	Director	February 17, 2022

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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, 2021 and 2020, the related consolidated statements of operations, comprehensive income, stockholders’ equity, and cash flows for each of the three years in the period ended December 31, 2020, 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, 2021 and 2020, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2020, 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, 2021, 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 17, 2022 expressed an unqualified opinion.

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 regarding 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.

Critical audit matter

The critical audit matter communicated below is a matter arising from the current period audit of the financial statements that was communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing separate opinions on the critical audit matter or on the accounts or disclosures to which it relates.

Realizability of Deferred Tax Assets and Valuation Allowance Assessment

As described further in Note 10 to the consolidated financial statements, the Company assesses the realizability of deferred income tax assets, which represent the tax benefits of future tax deductions, based on available positive and negative evidence and by considering the adequacy of future taxable income from all sources, including prudent and feasible tax planning strategies. The Company assesses the need for a valuation allowance by evaluating both positive and negative evidence that may exist. We identified the realizability of deferred tax assets and the assessment of the need for a valuation allowance as a critical audit matter.

The principal consideration for our determination that the realizability of deferred tax assets is a critical audit matter is that the forecast of future taxable income, exclusive of near-term uncertainties, and the assessment of this positive evidence against other negative evidence are estimates subject to a high level of estimation uncertainty. There is inherent uncertainty and subjectivity related to management’s judgments and assumptions regarding the Company’s future taxable income, exclusive of near-term uncertainties, which are complex in nature and require significant auditor judgment.

Our audit procedures related to the realizability of deferred tax assets and valuation allowance assessment included the following, among others.

- We tested the effectiveness of controls over management’s estimates of the realization of the deferred tax assets, including those over management’s long-range forecasts, which was the basis for the forecast of future taxable income, and the determination of whether it is more likely than not that the deferred tax assets will be realized prior to expiration.
- With the assistance of our income tax specialists, we evaluated the reasonableness of the methods, assumptions, and judgments used by management to assess available positive and negative evidence and determine whether a valuation allowance was necessary.
- We evaluated management’s ability to accurately estimate projected future taxable income by comparing actual results to management’s historical estimates and evaluating whether there have been any changes that would affect management’s ability to accurately estimate future taxable income.

/s/ GRANT THORNTON LLP

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

Arlington, Virginia
February 17, 2022

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, 2021, 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, 2020, 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, 2021, and our report dated February 17, 2022 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 17, 2022

SPOK HOLDINGS, INC.
CONSOLIDATED BALANCE SHEETS

(Dollars in thousands, except share and per share amounts)	December 31, 2021	December 31, 2020
ASSETS		
Current assets:		
Cash and cash equivalents	$ 44,583	$ 48,729
Short-term investments	14,999	29,995
Accounts receivable, net	26,908	29,934
Prepaid expenses	6,641	8,958
Other current assets	922	1,269
Total current assets	94,053	118,885
Non-current assets:		
Property and equipment, net	6,746	7,815
Operating lease right-of-use assets	15,821	14,016
Capitalized software development, net	—	10,179
Goodwill	99,175	99,175
Intangible assets, net	—	417
Deferred income tax assets, net	31,653	25,826
Other non-current assets	706	978
Total non-current assets	154,101	158,406
TOTAL ASSETS	$ 248,154	$ 277,291
LIABILITIES AND STOCKHOLDERS’ EQUITY		
Current liabilities:		
Accounts payable	$ 5,292	$ 6,685
Accrued compensation and benefits	13,948	14,103
Deferred revenue	25,608	27,686
Operating lease liabilities	5,405	5,264
Other current liabilities	4,745	3,702
Total current liabilities	54,998	57,440
Non-current liabilities:		
Asset retirement obligations	6,355	7,289
Operating lease liabilities	11,883	9,456
Other non-current liabilities	1,227	2,493
Total non-current liabilities	19,465	19,238
TOTAL LIABILITIES	74,463	76,678
COMMITMENTS AND CONTINGENCIES (Note 11)		
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; 19,828,033 and 19,384,192 shares issued and outstanding as of December 31, 2021, and December 31, 2020, respectively.	2	2
Additional paid-in capital	97,291	91,780
Accumulated other comprehensive loss	(1,588)	(1,452)
Retained earnings	77,986	110,283
TOTAL STOCKHOLDERS’ EQUITY	173,691	200,613
TOTAL LIABILITIES AND STOCKHOLDERS’ EQUITY	$ 248,154	$ 277,291

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, 2021	2020	2019
Revenue:			
Wireless revenue	$ 78,826	$ 83,593	$ 88,167
Software revenue	63,327	64,587	72,122
Total revenue	142,153	148,180	160,289
Operating expenses:			
Cost of revenue (exclusive of items shown separately below)	32,574	31,355	32,581
Research and development	17,920	15,828	27,543
Technology operations	29,247	29,843	31,428
Selling and marketing	20,168	19,467	23,170
General and administrative	43,853	40,289	43,278
Depreciation, amortization and accretion	10,446	9,056	9,249
Goodwill and capitalized software development impairment	15,663	25,007	8,849
Total operating expenses	169,871	170,845	176,098
Operating loss	(27,718)	(22,665)	(15,809)
Interest income	320	687	1,651
Other income	66	208	735
Loss before income taxes	(27,332)	(21,770)	(13,423)
Benefit from (provision for) income taxes	5,152	(22,455)	2,658
Net loss	$ (22,180)	$ (44,225)	$ (10,765)
Basic and diluted net loss per common share	$ (1.14)	$ (2.32)	$ (0.56)
Basic and diluted weighted average common shares outstanding	19,404,477	19,028,918	19,089,402
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,		
(Dollars in thousands)	**2021**	**2020**	**2019**
Net loss	$ (22,180)	$ (44,225)	$ (10,765)
Other comprehensive (loss) income, net of tax:			
Foreign currency translation adjustments	(136)	149	(300)
Other comprehensive (loss) income	(136)	149	(300)
Comprehensive loss	$ (22,316)	$ (44,076)	$ (11,065)

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

SPOK HOLDINGS, INC.
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

(Dollars in thousands, except share amounts)	Outstanding Common Shares	Common Stock	Additional Paid-In Capital and Accumulated Other Comprehensive Loss	Retained Earnings	Total Stockholders' Equity
Balance, January 1, 2019	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 2012 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
Net loss	—	—	—	(44,225)	(44,225)
Adoption of current expected credit loss ("CECL")	—	—	—	(365)	(365)
Issuance of common stock under the Employee Stock Purchase Plan	35,661	—	300	—	300
Issuance of common stock for vested restricted stock units under the 2012 Equity Plan	282,871	—	—	—	—
Purchase of common stock for tax withholding	(79,981)	—	(902)	—	(902)
Amortization of stock-based compensation	—	—	5,508	—	5,508
Cash dividends declared	—	—	—	(9,946)	(9,946)
Issuance of restricted stock under the Equity Plans	74,027	—	—	—	—
Cumulative translation adjustment	—	—	149	—	149
Balance, December 31, 2020	19,384,192	$ 2	$ 90,328	$ 110,283	$ 200,613
Net loss	—	—	—	(22,180)	(22,180)
Issuance of common stock under the Employee Stock Purchase Plan	16,015	—	132	—	132
Purchase of common stock for tax withholding	(172,594)		(1,860)	—	(1,860)
Amortization of stock-based compensation	—	—	7,239	—	7,239
Cash dividends declared	—	—	—	(10,117)	(10,117)
Issuance of restricted stock under the Equity Plans	430,476	—	—	—	—
Issuance of common stock in lieu of cash compensation	169,944	—	—	—	—
Cumulative translation adjustment	—	—	(136)	—	(136)
Balance, December 31, 2021	19,828,033	$ 2	$ 95,703	$ 77,986	$ 173,691

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, 2021	2020	2019
Operating activities:			
Net loss	$ (22,180)	$ (44,225)	$ (10,765)
Adjustments to reconcile net loss to net cash provided by operating activities:			
Depreciation, amortization and accretion	10,446	9,056	9,249
Goodwill and capitalized software development impairment	15,663	25,007	8,849
Valuation allowance	—	22,108	—
Deferred income tax (benefit) expense	(5,483)	438	(3,253)
Stock-based compensation	7,239	5,508	3,643
Provisions for credit losses, service credits and other	1,162	1,212	694
Changes in assets and liabilities:			
Accounts receivable	1,833	(1,588)	964
Prepaid expenses and other assets	2,594	1,445	1,676
Net operating lease liabilities	763	10	(148)
Accounts payable, accrued liabilities and other	(679)	4,017	742
Deferred revenue	(3,390)	3,175	42
Net cash provided by operating activities	7,968	26,163	11,693
Investing activities:			
Purchases of property and equipment	(4,393)	(3,455)	(4,837)
Capitalized software development	(10,842)	(11,252)	—
Purchase of short-term investments	(44,990)	(59,864)	(59,385)
Maturity of short-term investments	60,000	60,000	34,000
Net cash used in investing activities	(225)	(14,571)	(30,222)
Financing activities:			
Cash distributions to stockholders	(10,025)	(9,771)	(9,819)
Purchase of common stock (including commissions)	—	—	(6,575)
Proceeds from issuance of common stock under the Employee Stock Purchase Plan	132	301	258
Purchase of common stock for tax withholding on vested equity awards	(1,860)	(903)	(1,017)
Net cash used in financing activities	(11,753)	(10,373)	(17,153)
Effect of exchange rate on cash and cash equivalents	(136)	149	(300)
Net (decrease) increase in cash and cash equivalents	(4,146)	1,368	(35,982)
Cash and cash equivalents, beginning of period	48,729	47,361	83,343
Cash and cash equivalents, end of period	$ 44,583	$ 48,729	$ 47,361
Supplemental disclosure:			
Income taxes (refunds received) paid	$ (126)	$ 1	$ 901

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," the "Company," "we," "us" and "our") 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 products and services 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 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.

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.

Certain prior period amounts in the consolidated financial statements have been reclassified to conform to the current period's presentation, including a reclassification of $3.3 million from General and administrative expense to the Cost of revenue expense classification for the year ended December 31, 2021. Corresponding reclassifications of $2.8 million and $2.5 million were made to the Consolidated Statement of Operations for presentation purposes for the years ended December 31, 2020, and 2019. This reclassification was related to the recoverable taxes and regulatory fees associated with our wireless revenue. These reclassifications had no effect on the reported results of operations or the statement of financial position.

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 ongoing 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 the 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 the product or services we provide. 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 or 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 and subscriptions 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.

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 that 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 as 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, maintenance, and subscription 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 that include wireless, maintenance, or subscription 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. 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 $4.4 million, $4.3 million and $5.0 million for the years ended December 31, 2021, 2020 and 2019, 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, "Leases," to short-term leases. Those leases which have a term of less than 12 months will have lease payments recognized, in our Consolidated Statements 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 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 bond rates, 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 nonlease components, we have elected to make use of the practical expedient to account for each separate lease component and associated nonlease component as a single lease component. This practical expedient is applied to our facility and site leases whereby maintenance and utilities charges are included with lease components in the measurement of our lease liability.

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

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, assessment of the Company's future projected discounted cash flows and other relevant information if available.

We recorded no impairment of goodwill for the year ended December 31, 2021, and impairment of $25.0 million and $8.9 million for the years ended December 31, 2020, and 2019, respectively.

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 (asset groups) may not be recoverable. When applicable, we assess the recoverability of the carrying value of our long-lived assets (asset groups) and certain amortizable intangible assets based on estimated undiscounted cash flows generated from such assets (asset groups). We determine asset groups based on the lowest level for which identifiable cash flows are largely independent of the cash flows of other assets and liabilities. In assessing the recoverability of these assets, we forecast cash flows based on various operating assumptions such as revenue forecasted by product line, in-process research and development cost, and other direct costs. Significant judgment is required in determining the recoverability, including the timing and appropriateness of the estimated undiscounted cash flows. 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. Significant judgment may be required in estimating fair value dependent on the availability of objective, market-based, evidence and the input level (e.g., Level 1, 2 or 3) of that evidence.

We recorded impairment of $15.7 million for the year ended December 31, 2021, related to capitalized software development. We did not record any impairment of long-lived assets or definite lived intangible assets for the years ended December 31, 2020, and 2019.

For additional details refer to Note 7, "Goodwill, Capitalized Software Development and Intangible Assets, Net."

Accounts Receivable Allowances

Our two most significant allowance accounts are: an allowance for credit losses 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 credit losses 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 credit losses. 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 credit losses 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.

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 at 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 of contractor fees to remove each asset, based on historical trend, is estimated to escalate by 2.1% 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 6, "Consolidated Financial Statements' Components", and Note 8, "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 calculated 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 assess the recoverability of our deferred income tax assets, which represent the tax benefits of future tax deductions, based on available positive and negative evidence and 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" (meaning a probability of greater than 50%) that all or some portion of our deferred income tax assets will be realized in future periods. We provide a valuation allowance when we consider it "more likely than not" that a deferred income tax asset will not be fully recovered. The assessment of our deferred income tax assets requires significant judgment.

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. The assessment of an uncertain tax position requires significant judgment. We had no uncertain tax positions for the periods ended December 31, 2021, and 2020 (see Note 10, "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 were capitalized while in the application development stage related to software developed for internal use or software sold in a Software as a Service ("SaaS") arrangement. This included certain development costs for our integrated communications and collaboration platform, Spok Go®, prior to our new strategic business plan in February 2022 that discontinued Spok Go. These costs qualified for capitalization beginning in the first quarter of 2020. All other costs incurred during the preliminary project stage or the post-implementation stage were expensed as incurred. Significant judgment was required when assessing costs and determining whether they fell within the preliminary project, application development, or post-implementation stage that determined whether the associated costs were expensed as incurred or capitalized.

Capitalized software development was amortized on a straight-line basis over the estimated useful life of the asset, typically three years, beginning when those development efforts were placed into service (e.g., generally once made commercially available). Determining the estimated useful life required significant judgment as we considered factors such as the rapid and continuous developments in software technology, obsolescence and anticipated life of the service offering before enhancements would have been necessary. In a SaaS environment, customer needs are rapidly evolving and a shorter useful life was generally expected.

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 $1.4 million, $1.3 million and $1.7 million for the years ended December 31, 2021, 2020, and 2019, 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 for RSUs and restricted stock is measured based on the closing fair market value of the Company's common stock on the date of grant. Fair value for ESPP is measured using the Black-Scholes model for each offering period based on the offer date. 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 9, "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, 2021, 2020, and 2019, our bad debt expenses were $0.7 million, $1.1 million and $0.7 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, 2021, 2020, and 2019.

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, 2021, and 2020 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 potentially 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 9, "Stockholders' Equity."

NOTE 2 - RECENT ACCOUNTING STANDARDS

The Company considers the applicability and impact of all Accounting Standards Updates ("ASUs") issued by the Financial Accounting Standards Board ("FASB"). The Company has determined that all recent ASUs issued by the FASB are either not applicable or are not expected to have a material impact on the Company's Consolidated Financial Statements.

NOTE 3 - RESTRUCTURING SUBSEQUENT EVENT

In February 2022, the Company announced a new strategic business plan that includes a restructuring of its business to discontinue Spok Go, eliminate all associated costs and optimize the Company’s existing structure to drive continued cost improvement.

As part of the restructuring program, the Company intends to eliminate approximately 175 positions, primarily in research and development, but also in professional services, selling and marketing, and back-office support functions. The Company expects to record one-time pre-tax restructuring charges of approximately $6.4 million to $10.2 million, comprised of approximately $5.0 million to $6.6 million in severance and personnel related costs and approximately $1.4 million to $3.4 million in contractual terminations. Future cash payments related to these charges are expected to generally be within the same range. The restructuring actions associated with these charges are expected to be substantially complete in 2022.

NOTE 4 - REVENUE, DEFERRED REVENUE AND PREPAID COMMISSIONS

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 following table presents our revenues disaggregated by revenue type:

(Dollars in thousands)	For the Year Ended December 31, 2021	2020	2019
Revenue:			
Paging revenue	$ 75,845	$ 79,916	$ 85,067
Product and other revenue	2,981	3,677	3,100
Wireless revenue	$ 78,826	$ 83,593	$ 88,167
License	$ 5,494	$ 5,179	$ 8,950
Professional services	17,161	17,910	19,189
Hardware	2,267	2,841	3,618
Subscription	423	66	—
Operations revenue	25,345	25,996	31,757
Maintenance	37,982	38,591	40,365
Software revenue	$ 63,327	$ 64,587	$ 72,122
Total revenue	$ 142,153	$ 148,180	$ 160,289

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, 2021, 2020 and 2019. Revenue generated in the U.S. and internationally consisted of the following for the periods stated:

(Dollars in thousands)	For the Year Ended December 31, 2021	2020	2019
Revenue:			
United States	$ 138,265	$ 145,349	$ 154,766
International	3,888	2,831	5,523
Total revenue	$ 142,153	$ 148,180	$ 160,289

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, 2021, are as follows:

(Dollars in thousands)	December 31, 2020	Additions	Revenue Recognized	December 31, 2021
Deferred Revenue	$ 29,796	$ 59,165	$ (62,555)	$ 26,406

During the twelve months ended December 31, 2021, the Company recognized $25.2 million of revenue related to amounts deferred as of December 31, 2020.

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 year ended December 31, 2021, are as follows:

(Dollars in thousands)	December 31, 2020	Additions	Commissions Recognized	December 31, 2021
Prepaid Commissions	$ 2,290	$ 3,957	$ (4,426)	$ 1,821

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

Remaining Performance Obligations

The balance of consideration allocated to remaining performance obligations at December 31, 2021, was $43.4 million. We expect to recognize approximately $30.4 million of these remaining performance obligations over the next 12 months, with the remaining balance recognized thereafter.

NOTE 5 - 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 Statements of Operations. The following table presents lease costs disaggregated by type:

	For the Year Ended December 31,		
(Dollars in thousands)	2021	2020	2019
Operating lease cost	$ 6,221	$ 5,797	$ 5,823
Short-term lease cost	10,529	7,991	8,281
Short-term lease cost - related party[(1)]	—	3,518	3,589
Total lease cost	$ 16,750	$ 17,306	$ 17,693

[(1)] A former member of our Board of Directors, who departed the Board during the third quarter of 2020, concurrently served as a director for an entity that leases transmission tower sites to the Company. Refer to Note 13, "Related Parties," for additional details.

The following table presents supplemental cash flow information:

	For the Year Ended December 31,		
)ollars in thousands)	2021	2020	2019
Cash paid for amounts included in the measurement of lease liabilities - operating leases	$ 5,625	$ 5,685	$ 5,678

The following table presents the weighted average remaining lease term and discount rate:

	December 31,		
)ollars in thousands)	2021	2020	2019
Veighted-average remaining lease term - operating leases (in years)	4.73	5.06	5.60
Veighted-average discount rate - operating leases	4.44%	5.17%	5.45%

We relocated our corporate headquarters in March of 2021 to office space located in Alexandria, Virginia, consisting of approximately 26,000 square feet of space under a lease that will expire on September 30, 2026. At that time, we recorded $4.4 million in a right-of-use asset and corresponding operating lease liability for this lease.

Maturities of lease liabilities as of December 31, 2021, were as follows:

(Dollars in thousands)	For the Year Ended December 31,
2022	$ 5,418
2023	4,244
2024	3,284
2025	2,372
2026	1,975
Thereafter	1,923
Total future lease payments	19,216
Imputed interest	(1,928)
Total	$ 17,288

NOTE 6 - 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)	2021	2020	2019
Depreciation			
Leasehold improvements	$ 88	$ 57	$ 63
Asset retirement costs	(87)	(643)	(766)
Paging and computer equipment	3,797	5,291	6,526
Furniture, fixtures and vehicles	258	307	374
Total depreciation	4,056	5,012	6,197
Amortization			
Intangible assets	417	2,500	2,500
Capitalized software development costs	5,357	1,073	—
Total amortization	5,774	3,573	2,500
Accretion	616	471	552
Total depreciation, amortization and accretion expense	$ 10,446	$ 9,056	$ 9,249

Accounts Receivable, net

Accounts receivable was recorded net of an allowance of $1.4 million and $1.7 million for the years ended December 31, 2021 and 2020, respectively. Accounts receivable, net included $7.1 million and $7.0 million of unbilled receivables for the years ended December 31, 2021, and 2020, 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.

Property and Equipment, net

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

(Dollars in thousands)	Useful Life (In Years)	For the Year Ended December 31, 2021	2020
Leasehold improvements	lease term	$ 3,307	$ 3,628
Asset retirement costs	1-5	2,307	3,717
Paging and computer equipment	1-5	89,844	92,608
Furniture, fixtures and vehicles	3-5	3,668	3,517
Total property and equipment		99,126	103,470
Accumulated depreciation		(92,380)	(95,655)
Total property and equipment, net		$ 6,746	$ 7,815

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 2021 (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 2025 to 2026. 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 2022. 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 7 - GOODWILL, CAPITALIZED SOFTWARE DEVELOPMENT AND INTANGIBLE ASSETS, NET

Goodwill

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. There are a number of judgmental factors that are incorporated into our assessment to establish an estimated control premium, including the review of current and past market information published by a third-party resource, assessment of the Company's future projected discounted cash flows and other relevant information if available. While a formal impairment assessment is performed annually, the Company monitors its business environment for potential triggering events on a quarterly basis.

The change in goodwill for the year ended December 31, 2021, was as follows:

(Dollars in thousands)	Change in Goodwill
Goodwill at December 31, 2019	$ 124,182
Impairment	$ (25,007)
Goodwill at December 31, 2020	$ 99,175
Impairment	—
Goodwill at December 31, 2021	$ 99,175

Capitalized Software Development

Capitalized software development is amortized on a straight-line basis over the estimated useful life of the asset, typically three years. Capitalized software development costs were $10.8 million and $11.3 million for the years ended December 31, 2021, and 2020, respectively. Amortization expense with respect to software development costs was $5.4 million and $1.1 million for the years ended December 31, 2021, and 2020, respectively.

During the quarter ended December 31, 2021, we determined that a triggering event had occurred based on a number of factors including a continuing trend of unsatisfactory Spok Go sales relative to our expectations, a significant accumulation of costs combined with a reduction of future sales projections which indicated continuing losses associated with Spok Go, and our expectation that Spok Go would not provide substantive future service potential. As such, further assessment of recoverability was necessary. We identified the long-lived asset group, for which we assessed recoverability, as our total capitalized software development costs. This asset group is the lowest level for which identifiable cash flows are largely independent of the cash flows of other assets and liabilities.

We assessed recoverability based on the sum of the estimated undiscounted net cash flows of the long-lived asset group. The assessment of recoverability requires significant judgment, including timing and appropriateness of the estimated undiscounted future net cash flows. Our assessment determined that the carrying amount of the long-lived asset group was greater than the estimated undiscounted cash flows and further assessment of fair value was necessary to determine whether an impairment loss should be recognized.

]We estimated fair value taking into consideration a number of factors including estimates used in our assessment of recoverability, discounted cash flow methods incorporating market-based information that we gathered as part of our on-going strategic alternatives process, and the projected continuance of costs necessary to create substantive future service potential. Given the nature of these capitalized software development costs where observable market prices are not readily available, the assessment of fair value requires significant judgment and estimates. This analysis determined that the remaining balance of capitalized software development costs had no fair value, and as a result, we recorded an impairment charge of $15.7 million for the three months ended December 31, 2021.

Intangible Assets

Amortizable intangible assets at December 31, 2021, and 2020 related primarily to customer relationships. These intangible assets, with an original gross carrying amount of $25.0 million, were being amortized over a period of ten years and became fully amortized during the quarter ended March 31, 2021. We did not record an impairment of our amortizable intangible assets during the years ended December 31, 2021, 2020 and 2019.

The net consolidated balance of intangible assets consisted of the following at December 31, 2021, and 2020:

	As of December 31,					
	2021			2020		
(Dollars in thousands)	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Customer relationships	$ 25,002	$ (25,002)	$ —	$ 25,002	$ (24,585)	$ 417

NOTE 8 - 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 December 31, 2019	$ 90	$ 6,061	$ 6,151
Accretion	(38)	509	471
Amounts paid	(352)	—	(352)
Additions	169	1,185	1,354
Reclassifications	466	(466)	—
Balance at December 31, 2020	335	7,289	7,624
Accretion	(125)	741	616
Amounts paid	(334)	—	(334)
Additions	(129)	(1,292)	(1,421)
Reclassifications	383	(383)	—
Balance at December 31, 2021	$ 130	$ 6,355	$ 6,485

Increases and reductions other than accretion, reclassification and amounts paid primarily relate to changes in estimates of the underlying liability, specifically related to updates in estimated costs to remove a transmitter and the estimated timing of removal. Estimated removal costs and timing refinements due to ongoing network rationalization activities are expected to accrete to a total liability of $7.8 million.

Additional information regarding asset retirement costs and accretion expense can be found in Note 6, "Consolidated Financial Statements' Components."

NOTE 9 - 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, 2021, and 2020, we had no stock options outstanding.

At December 31, 2021, and 2020, there were 19,828,033 and 19,384,192 shares of common stock outstanding, respectively, and no shares of preferred stock were outstanding.

Rights Plan

On September 2, 2021, the Company entered into a Rights Agreement between the Company and Computershare Trust Company, N.A., as Rights Agent (as amended from time to time, the “Rights Agreement”), that was approved by our Board of Directors. In connection with the Rights Agreement, a dividend was declared of one preferred stock purchase right (individually, a “Right” and collectively, the “Rights”) for each share of our common stock outstanding at the close of business on September 17, 2021. Each Right will entitle the registered holder thereof, after the Rights become exercisable and until August 31, 2022 (or the earlier redemption, exchange or termination of the Rights), to purchase from the Company one one-tenth of a share of Series A Junior Participating Preferred Stock, par value $0.00001 per share (the “Series A Preferred”), of the Company at a price of $50.95 per one one-tenth of a share of Series A Preferred.

The Rights become exercisable upon the earlier to occur of (i) the close of business on the tenth business day following a public announcement that a person or group of affiliated or associated persons has acquired, or obtained the right to acquire, beneficial ownership of 10% (20% in the case of a passive institutional investor) or more of our common stock (an “Acquiring Person”) or (ii) the close of business on the tenth business day (or such later date as may be determined by action of our Board of Directors prior to such time as any person or group of affiliated or associated persons becomes an Acquiring Person) following the commencement or announcement of an intention to make a tender offer or exchange offer, the consummation of which would result in a person or group becoming an Acquiring Person.

Dividends

For each of the three years ending December 31, 2021, 2020 and 2019, 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 Consolidated Statements of Cash Flows for the years ended December 31, 2021, 2020 and 2019 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 16, 2022, the Board of Directors declared an increase in the regular quarterly cash dividend to $0.3125 per share of common stock, with a record date of March 16, 2022, and a payment date of March 30, 2022. This cash dividend of approximately $6.2 million is expected to be paid from available cash on hand.

Common Stock Repurchase Program

In August 2018, our Board of Directors authorized the repurchase of up to $10.0 million of our common stock through December 31, 2018. In November 2018, our Board of Directors extended the repurchase authority through December 31, 2019. The Company fully exhausted the repurchase authority in September 2019. In February 2022, our Board of Directors authorized the repurchase of up to $10.0 million of our common stock.

We used available cash on hand and net cash provided by operating activities to fund the common stock repurchase program. This 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.

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 were returned to the status of authorized, but unissued, shares of the Company.

The Company did not repurchase any of its common stock during 2021 or 2020. Common stock repurchased in 2019 (excluding commission and the purchase of common stock for tax withholdings) was as follows:

(Dollars in thousands, except for shares purchased)	2019	
For the Three Months Ended	Shares Purchased	Amount
March 31,	131,012	$ 1,806
June 30,	—	—
September 30,	401,342	4,749
December 31,	—	—
Total	532,354	$ 6,555

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:

(In thousands, except for share and per share amounts)	For the Year Ended December 31, 2021	2020	2019
Numerator:			
Net loss	$ (22,180)	$ (44,225)	$ (10,765)
Denominator:			
Basic and diluted weighted average outstanding shares of common stock	19,404,477	19,028,918	19,089,402
Basic and diluted net loss per common share	$ (1.14)	$ (2.32)	$ (0.56)

For the years ended December 31, 2021, 2020 and 2019, 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, 2021	2020	2019
Restricted stock units	371,194	297,757	189,862

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 our stockholders subsequently approved on May 16, 2012. A total of 2,194,986 shares of common stock were reserved for issuance under this plan.

On April 29, 2020, our Board of Directors adopted the Spok Holdings, Inc. 2020 Equity Incentive Award Plan (the "2020 Equity Plan" and together with the 2012 Equity Plan, the "Equity Plans") that our stockholders subsequently approved on July 28, 2020. At July 28, 2020, a total of 1,699,950 shares of common stock had been reserved for issuance under the Equity Plans, including 1,600,000 shares available under the 2020 Equity Plan and 99,950 shares which, as of the Stockholder Approval Date, remained available for issuance under the 2012 Equity Plan. No further grants were to be made under the 2012 Equity Plan, although the 2012 Equity Plan continues to govern all outstanding awards thereunder.

Awards under the 2020 Equity Plan may be in the form of stock options, restricted common stock, RSUs, performance awards, dividend equivalents, stock payment awards, deferred stock, deferred stock units ("DSUs"), stock appreciation rights or other stock or cash-based awards.

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

Dividend equivalent rights generally accompany each DSU award and are paid to participants in cash on the Company's applicable dividend payment date whether the DSU is vested or unvested. The dividend equivalent right associated with a DSU continues until delivery of the underlying shares of common stock is made.

Payment of the underlying shares of common stock occurs at the earliest of a participant's separation from service, disability, death, or a change in control. Any shares subject to an award under the 2012 Equity Plan that are forfeited or expire will be available for the future grant of awards under the 2020 Equity Plan. As of December 31, 2021, there was an aggregate of 274,320 unvested RSUs under the 2012 Equity Plan.

The following table summarizes the activities under the Equity Plans from January 1, 2019, through December 31, 2021:

	Activity
Total equity securities available at January 1, 2019	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
Less: RSU and restricted stock awarded to eligible employees, net of forfeitures	(547,166)
Plus: Additional shares available for issuance under the 2020 Equity Plan	1,600,000
Total equity securities available at December 31, 2020	1,699,314
Less: RSU, DSU and restricted stock awarded to eligible employees, net of forfeitures	(539,241)
Less: stock issued in lieu of cash compensation	(169,944)
Total equity securities available at December 31, 2021	990,129

The following table details activities with respect to outstanding RSUs, DSUs, and restricted stock under the Equity Plans for the year ended December 31, 2021:

	Shares	Weighted-Average Grant Date Fair Value per Share
Unvested at January 1, 2021	636,722	$ 12.16
Granted	657,492	11.02
Vested	(404,792)	12.07
Forfeited	(118,251)	12.08
Unvested at December 31, 2021	771,171	$ 11.24

Of the 771,171 unvested RSUs, DSUs and restricted stock outstanding at December 31, 2021, 381,317 RSUs include contingent performance requirements for vesting purposes. At December 31, 2021, there was $4.1 million of unrecognized net compensation cost related to RSUs and restricted stock, which is expected to be recognized over a weighted average period of 1.6 years.

During the years ended December 31, 2020, and 2019, the Company granted 603,171 and 388,321 RSUs, respectively, with a weighted-average grant date fair value of $11.94 and $13.27 per share, respectively. The fair value of RSUs that vested during the years ended December 31, 2020, and 2019 were $3.7 million and $3.0 million, respectively, based on the closing price of the Company's common stock of $11.13 and $12.23 at December 31, 2020, and 2019, respectively.

Employee Stock Purchase Plan

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

The 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.

The Company uses the Black-Scholes model to calculate the fair value of each offering period on the 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 years ended December 31, 2021, and 2020, employees purchased 16,015 and 35,661 shares of the Company's common stock for a total price of $0.1 million, and $0.3 million, respectively.

The following table summarizes the activities under the ESPP from January 1, 2019, through December 31, 2021:

	Activity
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 January 1, 2020	184,860
Less: common stock purchased by eligible employees	(35,661)
Total ESPP equity securities available at January 1, 2021	149,199
Less: common stock purchased by eligible employees	(16,015)
Total ESPP equity securities available at December 31, 2021	133,184

Amounts withheld from participants will be classified as a liability on the Consolidated Balance Sheets 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)	**2021**	**2020**	**2019**
Performance-based RSUs	$ 1,608	$ 2,019	$ 1,434
Time-based RSUs and restricted stock	3,754	3,389	2,119
Equity in lieu of salary	1,845	—	—
ESPP	32	100	90
Total stock-based compensation	$ 7,239	$ 5,508	$ 3,643

NOTE 10 - INCOME TAXES

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

(Dollars in thousands)	For the Year Ended December 31, 2021	2020	2019
Loss before income taxes	$ (27,332)	$ (21,770)	$ (13,423)
Current:			
Federal tax	$ —	$ —	$ —
State tax	48	58	582
Foreign tax	283	(150)	13
Total current	331	(92)	595
Deferred:			
Federal tax	(4,178)	20,594	(2,121)
State tax	(1,561)	1,910	(1,239)
Foreign tax	256	43	107
Total deferred	(5,483)	22,547	(3,253)
Benefit from (provision for) income taxes	$ (5,152)	$ 22,455	$ (2,658)

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 for the years ended December 31, 2021, 2020 and 2019:

(Dollars in thousands)	2021		2020		2019	
Loss before income taxes	$ (27,332)		$ (21,770)		$ (13,423)	
Income taxes computed at the federal statutory rate	$ (5,740)	21.0 %	$ (4,572)	21.0 %	$ (2,819)	21.0 %
State income taxes, net of federal benefit	(1,513)	5.5 %	(703)	3.2 %	(567)	4.2 %
Goodwill impairment	—	— %	6,341	(29.1)%	2,243	(16.7)%
Change in valuation allowance	2,070	(7.6)%	22,108	(101.6)%	—	— %
Research and development and other tax credits	(808)	3.0 %	(1,316)	6.0 %	(1,790)	13.3 %
Excess executive compensation	272	(1.0)%	266	(1.2)%	322	(2.4)%
Other	567	(2.1)%	331	(1.5)%	(47)	0.4 %
(Benefit from) provision for income taxes	$ (5,152)	18.8 %	$ 22,455	(103.1)%	$ (2,658)	19.8 %

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, 2021, and 2020 were as follows:

(Dollars in thousands)	December 31, 2021	December 31, 2020
Capitalized research and development costs	$ 13,436	$ 13,367
Net operating loss carryforward	25,284	18,081
Property and equipment	5,139	5,353
Accrued liabilities, reserves and other expenses	4,726	5,063
Research and development credits	6,342	5,533
Tax credits	495	717
Stock based compensation	2,283	1,917
Other	289	132
Gross deferred income tax assets	57,994	50,163
Deferred income tax liabilities:		
Intangible assets	(2,128)	(2,015)
Prepaid and other expenses	(35)	(214)
Gross deferred income tax liabilities	(2,163)	(2,229)
Net deferred income tax assets	55,831	47,934
Valuation allowance	(24,178)	(22,108)
Total deferred income tax assets	$ 31,653	$ 25,826

The Coronavirus Aid Relief and Economic Security ("CARES") Act was signed into law on March 27, 2020, to provide stimulus and relief in response to the COVID-19 pandemic and resulting economic collapse. While the CARES Act provides a number of potential benefits to companies, the Company has made use of the following provisions:

- **Payroll Tax Deferral:** Allows for the deferral of payment on the Company's share of the 6.2% Social Security tax on wages paid beginning on March 27, 2020, and ending on December 31, 2020. Deferred amounts are payable in two installments, with 50% of such taxes due on December 31, 2021, and the remainder due on December 31, 2022. This resulted in a total deferral of $2.1 million in payroll taxes under this provision for the year ended December 31, 2020.
- **Employee Retention Credits:** Allows for a refundable tax credit for the Company's share of the 6.2% Social Security tax on wages. This tax credit applies to the first $10,000 in qualified wages paid to each employee after March 12, 2020, and before January 1, 2021. To be eligible, the Company must (i) have had operations fully or partially suspended because of a shutdown order from a governmental authority related to COVID-19, or (ii) have had gross receipts decline by more than 50% in a calendar quarter when compared to the same quarter in 2019. Qualified wages are limited to wages paid to employees who were not providing services due to the COVID-19 pandemic. This resulted in a total claim of approximately $1.3 million in employee retention credits under this provision for the year ended December 31, 2020.
- **Alternative Minimum Tax ("AMT") Credit:** Allows for an immediate refund of all refundable AMT credits resulting from passage of the CARES Act of 2020. This resulted in accelerated collection of approximately $1.3 million of other current assets which was received during the third quarter of 2020.

Net Operating Losses

As of December 31, 2021, we had approximately $108.3 million of net operating losses available to offset future taxable income, of which approximately $70.6 million were federal net operating losses with expiration dates that begin expiring in 2026 and will fully expire in 2030. We have an immaterial amount of foreign 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, based on available positive and negative evidence and 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" (meaning a probability of greater than 50%) that all or some portion of the deferred income tax assets will be realized in future periods.

The cumulative loss incurred by the Company over the three-year period ended December 31, 2020, constitutes a piece of objective negative evidence which limits our ability to consider other subjective evidence. In addition, the uncertainty created by COVID-19, has meaningfully limited our ability to consider our projections for future profitability and growth in our assessment of the recoverability of our deferred income tax assets. We traditionally perform this evaluation in the fourth quarter of each year, utilizing our annual long-range planning and forecasting updates. As of December 31, 2021, and 2020, our deferred tax assets were net of valuation allowances of $24.2 million and $22.1 million, respectively. COVID-19 has significantly limited our ability to consider projections for future profitability as objectively verifiable positive evidence to support the realizability of deferred tax assets. As a result, we continue to maintain a valuation allowance against deferred tax assets associated with net operating losses and credits with set expiration dates.

Those deferred income tax assets which are not currently covered by a valuation allowance are those that are indefinite-lived, or whose temporary differences would reverse in the future and may result in the creation of an indefinite-lived deferred income tax asset, which we consider to be realized through future taxable income despite near term uncertainties. The amount of deferred income tax assets considered realizable, however, could be adjusted in the future if objective negative evidence in the form of cumulative losses is no longer present, additional weight is given to subjective evidence such as our projections for future profitability and growth, or other relevant factors arise. We did not record a valuation allowance in 2019.

Income Tax Audits

The 2019, 2020 and 2021 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 2018 through 2021, and for the four-year SOL states, the SOL is open for years ending from 2017 through 2021.

NOTE 11 - COMMITMENTS AND CONTINGENCIES

Contractual Obligations

We had no significant commitments and contractual obligations as of December 31, 2021.

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.

Loss Contingencies

The Company evaluates contingencies on an ongoing basis and establishes loss provisions for matters in which losses are probable and the amount of loss can be reasonably estimated. As part of this evaluation, the Company recognized a loss of $0.9 million in the fourth quarter of 2021 related to the minimum remaining contractual obligation for a license and service contract classified as a research and development cost on the Consolidated Statement of Operations.

This contract was originally intended to provide Spok Go with a source for electronic health record ("EHR") integration and enable the application to display content that was not previously available from all EHR's through an application programming interface. To date, we have not enhanced Spok Go such that it can make use of these integration licenses. New standards require that EHR's support the seamless and secure access, exchange, and use of information by third parties. With the change in standards and the ongoing iteration of internal development plans, we believe it is more likely than not that future Spok Go enhancements will make use of direct EHR access under these new standards as opposed to the use of a third party. Thus, as of December 31, 2021, it was more likely than not that we would be unable to realize any benefits from the remaining $0.9 million contractual obligation under this contract which extends through late 2023.

Legal Contingencies

We are involved, from time to time, in lawsuits arising in the normal course of business. We believe the potential outcomes from these 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, 2021, were as follows:

(Dollars in thousands)

For the Year Ended December 31,	Operating Leases
2022	$ 6,217
2023	4,238
2024	2,381
2025	1,489
2026	1,110
Thereafter	189
Total	$ 15,624

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, 2021, 2020 and 2019, was approximately $16.8 million, $17.3 million and $17.7 million, respectively.

NOTE 12 - EMPLOYEE BENEFIT PLANS

The Company has a savings plan in the U.S., the Spok Holdings, Inc. Savings and Retirement Plan, which qualifies under Section 401(k) of the Internal Revenue Code. Participating U.S. employees may elect to contribute a percentage of their wages, subject to certain limitations. Matching contributions under the savings plan were approximately $1.6 million for the years ended December 31, 2021, 2020, and 2019.

NOTE 13 - RELATED PARTIES

A former member of our Board of Directors, who departed the Board during the third quarter of 2020, concurrently served as a director for an entity that leases transmission tower sites to the Company. For the years ended December 31, 2020, and 2019, we recorded site rent expenses pertaining to these leases of $3.5 million and $3.6 million, respectively. These amounts were included within technology operations expenses.

A member of our Board of Directors, who was appointed at the beginning of 2020, serves as Chief Information Officer for an entity that is also a customer of the Company. For the years ended December 31, 2021, and 2020, we recognized revenues of $1.0 million and $0.7 million, respectively, related to contracts from the entity at which the individual is employed.

SCHEDULE II

SPOK HOLDINGS, INC.
VALUATION AND QUALIFYING ACCOUNTS

Allowance for Credit Losses, Service Credits and Other (Dollars in thousands)	Balance at the Beginning of the Period	Charged to Operations	Write-offs	Balance at the End of the Period
Year ended December 31, 2021	$ 1,669	$ 573	$ (800)	$ 1,442
Year ended December 31, 2020	$ 1,293	$ 1,382	$ (1,006)	$ 1,669
Year ended December 31, 2019	$ 1,705	$ 1,248	$ (1,660)	$ 1,293

EXHIBIT INDEX

Exhibit Number	Exhibit Description	Incorporated by Reference				Filed/Furnished Herewith
		Form	File No.	Exhibit	Filing Date	
3.1	Amended and Restated Certificate of Incorporation	8-K	001-32358	3.1	7/8/2014	
3.2	Third Amended and Restated Bylaws of Spok Holdings, Inc.	8-K	001-32358	3.1	10/30/2020	
3.3	Certificate of Designations of Series A Junior Participating Preferred Stock of Spok Holdings, Inc.	8-K	001-32358	3.1	9/3/2021	
4.1*	Specimen of common stock certificate, par value $0.0001 per share	S-4/A	333-115769	4.1	10/6/2004	
4.2	Rights Agreement, dated as of September 2, 2021, between Spok Holdings, Inc. and Computershare Trust Company N.A.	8-K	001-32358	4.1	9/3/2021	
4.3	Description of securities registered under Section 12 of the Securities Exchange Act of 1934					Filed
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. 2018 Long-Term Incentive Plan	10-K	001-32358	10.12	2/18/2021	
10.10†	Exhibits to Spok Holdings, Inc., 2018 Long-Term Incentive Plan for the 2019-2021 performance period.					Filed
10.11†	Spok Holdings, Inc. 2018 Short-Term Incentive Plan	10-K	001-32358	10.15	2/28/2019	
10.12†	Spok Holdings, Inc. 2019 Short-Term Incentive Plan	10-K	001-32358	10.16	2/28/2019	
10.13†	Spok Holdings, Inc. 2020 Short-Term Incentive Plan	10-K	001-32358	10.16	2/27/2020	
10.14†	Spok Holdings, Inc. 2021 Short-Term Incentive Plan	10-K	001-32358	10.16	2/18/2021	
10.15†	Spok Holdings, Inc. 2022 Short-Term Incentive Plan					Filed
10.16*	Amendment to the USA Mobility, Inc. 2012 Equity Incentive Award Plan	DEF 14A	001-32358	A	4/27/2017	
10.17†	NEO Severance and Change in Control Document	10-Q	001-32358	10.2	4/27/2017	
10.18†	Spok Holdings, Inc. 2020 Equity Incentive Award Plan	DEF 14A	001-32358	A	6/19/2020	
10.19†	Employment Agreement Extension Letter, by and between Spok Holdings, Inc. and Vincent D. Kelly, dated as of June 18, 2020	8-K	001-32358	10.1	6/18/2020	

10.20	Restricted Stock Unit Grant Notice for the Spok Holdings, Inc. 2020 Equity Incentive Award Plan	10-K	001-32358	10.21	2/18/2021	
10.21	Cooperation Agreement, dated as of June 18, 2020 by and among Spok Holdings, Inc., White Hat Strategic Partners LP, White Hat SP GP LLC, White Hat Capital Partners LP, and White Hat Capital Partners GP LLC	8-K	001-32358	10.1	6/19/2020	
10.22	Spok Holdings, Inc. Deferred Compensation Plan For Non-Employee Directors	10-K	001-32358	10.23	2/18/2021	
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	Inline XBRL Instance Document - the instance does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document**					Filed
101.SCH	Inline XBRL Taxonomy Extension Schema**					Filed
101.CAL	Inline XBRL Taxonomy Extension Calculation**					Filed
101.DEF	Inline XBRL Taxonomy Extension Definition**					Filed
101.LAB	Inline XBRL Taxonomy Extension Labels**					Filed
101.PRE	Inline XBRL Taxonomy Extension Presentation**					Filed
104	Cover Page Interactive Data File (the cover page XBRL tags are embedded within the Inline XBRL document and included in Exhibit 101)					Filed

* 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.

DESCRIPTION OF REGISTERED SECURITIES

Spok Holdings, Inc., a Delaware corporation (the “Company,” “we” or “our”), currently has two classes of securities registered under Section 12 of the Securities Exchange Act of 1934, as amended, the Company’s common stock, $0.0001 par value per share (“Common Stock”) and the preferred stock purchase rights discussed in “Preferred Stock Purchase Rights” below.

The following summary does not purport to be complete and is subject to, and qualified in its entirety by, the full text of our Amended and Restated Certificate of Incorporation (the “Certificate of Incorporation”) and our Second Amended and Restated Bylaws (the “Bylaws”). For additional information please refer to the Certificate of Incorporation, Bylaws, Certificate of Designations of Series A Junior Participating Preferred Stock and the Rights Agreement (as defined below) each of which are exhibits to our Annual Report on Form 10- K, and applicable provisions of the General Corporation Law of the State of Delaware (“DGCL”).

Authorized Capital Stock

We are authorized to issue a total of 100,000,000 shares of capital stock consisting of:

- 75,000,000 shares of Common Stock; and
- 25,000,000 shares of preferred stock, par value $0.0001 per share (“Preferred Stock”).

Our Board of Directors is expressly authorized to provide for the classification and reclassification of any unissued shares of Common Stock or Preferred Stock and the issuance thereof in one or more classes or series without the approval of our stockholders. There are no shares of our Preferred Stock currently outstanding. The Common Stock shall be subject to all of the rights, privileges, preferences and priorities of any series of Preferred Stock as may be set forth in the certificate of designations filed to establish such series of Preferred Stock.

Common Stock

Voting Rights

Each outstanding share of our Common Stock will be entitled to one vote per share.

Dividends

The holders of record of our Common Stock will be entitled to receive dividends, when, as, and if declared by our Board of Directors, out of any assets legally available for the payment of dividends thereon.

Liquidation Rights

In the event of our dissolution, liquidation or winding up, subject to the rights, if any, of the holders of any outstanding shares of Preferred Stock, holders of record of our Common Stock will be entitled to receive any assets made available for distribution to our stockholders ratably in proportion to the number of shares held by them.

Preemptive Rights

The holders of our Common Stock do not have preemptive rights to purchase or subscribe for our capital stock or other securities.

Regulatory Restrictions

Outstanding shares of our Common Stock may be redeemed by action of our Board of Directors to the extent necessary to prevent the loss of any governmental license or franchise, the holding of which is conditioned upon stockholders possessing prescribed qualifications.

Transfer Restrictions

We have certain favorable consolidated tax attributes that may be available to offset our consolidated taxable income. In order to reduce the possibility that certain changes in ownership could impose limitations on the use of these tax attributes, our Certificate of Incorporation contains provisions that, under certain circumstances, would restrict transfers by or to any 5% shareholder of our Common Stock or any transfer that would cause a person or group of persons to become a 5% shareholder of our Common Stock. For a more full description of these provisions, see our Certificate of Incorporation. Our stockholders are advised to carefully monitor their ownership of our Common Stock and consult their own legal advisors and/or us to determine whether their ownership of our Common Stock approaches the proscribed level.

Preferred Stock Purchase Rights

On September 2, 2021, we entered into a Rights Agreement between the Company and Computershare Trust Company, N.A. as Rights Agent (as amended from time to time, the "*Rights Agreement*") that was approved by the Board of Directors of the Company.

In connection with the Rights Agreement, a dividend was declared of one Preferred Stock purchase right (individually, a "*Right*" and collectively, the "*Rights*") for each share of our Common Stock outstanding at the close of business on September 17, 2021 (the "*Record Date*"). Each Right will entitle the registered holder thereof, after the Rights become exercisable and until August 31, 2022 (or the earlier redemption, exchange or termination of the Rights), to purchase from the Company one one-tenth of a share of Series A Junior Participating Preferred Stock, par value $0.00001 per share (the "*Series A Preferred*"), of the Company at a price of $50.95 per one one-tenth of a share of Series A Preferred (the "*Purchase Price*").

One Right was distributed to stockholders of the Company for each share of Common Stock owned of record on September 17, 2021. As long as the Rights are attached to the Common Stock, the Company will issue one Right with each new share of Common Stock so that all such shares will have attached Rights. The following is a summary of the material terms of the Rights Agreement.

Rights Certificates; Exercise Period; Term

Until the earlier to occur of (i) the close of business on the tenth business day following a public announcement that a person or group of affiliated or associated persons has acquired, or obtained the right to acquire, beneficial ownership of 10% (20% in the case of a passive institutional investor) or more of the Common Stock (an "*Acquiring Person*") or (ii) the close of business on the tenth business day (or such later date as may be determined by action of the Board of Directors prior to such time as any person or group of affiliated or associated persons becomes an Acquiring Person) following the commencement or announcement of an intention to make a tender offer or exchange offer the consummation of which would result in a person or group becoming an Acquiring Person (the earlier of (i) and (ii) being called the "*Distribution Date*"), the Rights will be evidenced, with respect to any of the Common Stock certificates outstanding as of the Record Date, by such Common Stock certificates, or, with respect to any uncertificated Common Stock registered in book entry form, by notation in book entry, in either case together with a copy of the Summary of Rights attached as Exhibit C to the Rights Agreement. Under the Rights Agreement, synthetic ownership of Common Stock in the form of derivative securities counts towards the ownership threshold, to the extent actual shares of Common Stock equivalent to the economic exposure created by the derivative security are directly or indirectly beneficially owned by a counterparty to such derivative security.

The Rights Agreement provides that any person who beneficially owned 10% (20% in the case of a passive institutional investor) or more of the Common Stock immediately prior to the first public announcement of the adoption of the Rights Agreement, together with any affiliates and associates of that person (each an "*Existing Holder*"), shall not be deemed to be an "Acquiring Person" for purposes of the Rights Agreement unless an Existing Holder becomes the beneficial owner of one or more additional shares of Common Stock (other than pursuant to a dividend or distribution paid or made by the Company on the outstanding Common Stock in Common Stock or pursuant to a split or subdivision of the outstanding Common Stock) and upon acquiring such additional shares, the Existing Holder beneficially owns 10% (20% or more in the case of a passive institutional investor) or more of the Common Stock then outstanding.

The Rights will be transferred only with the Common Stock until the Distribution Date (or earlier redemption, exchange, termination or expiration of the Rights). As soon as practicable following the Distribution Date, separate certificates evidencing the Rights ("*Right Certificates*") will be mailed to holders of record of the Common Stock as of the close of business on the Distribution Date, and such separate Right Certificates alone will evidence the Rights.

The Rights are not exercisable until the Distribution Date. The Rights will expire on August 31, 2022, subject to the Company's right to extend such date, unless earlier redeemed or exchanged by the Company or terminated. The Rights will at no time have any voting rights.

Rights and Preferences of Preferred Stock

Each share of Series A Preferred purchasable upon exercise of the Rights will be entitled, when, as and if declared, to a minimum preferential quarterly dividend payment of $1.00 per share or, if greater, an aggregate dividend of ten times the dividend, if any, declared per share of Common Stock. In the event of liquidation, dissolution or winding up of the Company, the holders of the Series A Preferred will be entitled to a minimum preferential liquidation payment of $10 per share (plus any accrued but unpaid dividends), provided that such holders of the Series A Preferred will be entitled to an aggregate payment of ten times the payment made per share of Common Stock. Each share of Series A Preferred will have ten votes and will vote together with the Common Stock. Finally, in the event of any merger, consolidation or other transaction in which shares of the Common Stock are exchanged, each share of Series A Preferred will be entitled to receive ten times the amount received per share of Common Stock. The Series A Preferred will not be redeemable. The Rights are protected by customary anti-dilution provisions. Because of the nature of the Series A Preferred's dividend and liquidation rights, the value of one one-tenth of a share of Series A Preferred purchasable upon exercise of each Right should approximate the value of one share of Common Stock.

Equitable Adjustments

The Purchase Price payable, and the number of one one-tenths of a share of Series A Preferred or other securities or property issuable, upon exercise of the Rights are subject to adjustment from time to time to prevent dilution (i) in the event of a stock dividend on, or a subdivision, combination or reclassification of, the Series A Preferred, (ii) upon the grant to holders of the Series A Preferred of certain rights or warrants to subscribe for or purchase Series A Preferred or convertible securities at less than the current market price of the Series A Preferred or (iii) upon the distribution to holders of the Series A Preferred of evidences of indebtedness, cash, securities or assets (excluding regular periodic cash dividends at a rate not in excess of 125% of the rate of the last regular periodic cash dividend theretofore paid or, in case regular periodic cash dividends have not theretofore been paid, at a rate not in excess of 50% of the average net income per share of the Company for the four quarters ended immediately prior to the payment of such dividend, or dividends payable in shares of Series A Preferred (which dividends will be subject to the adjustment described in clause (i) above)) or of subscription rights or warrants (other than those referred to above).

Flip-in and Flip-over Trigger

In the event that a person becomes an Acquiring Person or if the Company were the surviving corporation in a merger with an Acquiring Person or any affiliate or associate of an Acquiring Person and shares of the Common Stock were not changed or exchanged in such merger, each holder of a Right, other than Rights that are or were acquired or beneficially owned by the Acquiring Person (which Rights will thereafter be void), will thereafter have the right to receive upon exercise that number of shares of Common Stock having a market value of two times the then current Purchase Price of one Right. In the event that, after a person has become an Acquiring Person, the Company were acquired in a merger or other business combination transaction or more than 50% of its assets or earning power were sold, proper provision shall be made so that each holder of a Right shall thereafter have the right to receive, upon the exercise thereof at the then current Purchase Price of the Right, that number of shares of common stock of the acquiring company which at the time of such transaction would have a market value of two times the then current Purchase Price of one Right.

Exchange Feature

At any time after a person becomes an Acquiring Person and prior to the earlier of one of the events described in the last sentence of the previous paragraph or the acquisition by such Acquiring Person of 50% or more of the then outstanding Common Stock, the Board of Directors may cause the Company to exchange the Rights (other than Rights owned by an Acquiring Person which have become void), in whole or in part, for shares of Common Stock at an exchange rate of one share of Common Stock per Right (subject to adjustment).

Qualifying Offer

In the event that the Company receives a Qualifying Offer, the holders of record of at least 10% or more of the shares of Common Stock then outstanding (excluding shares of Common Stock that are beneficially owned by the person making the Qualifying Offer) may submit to the Board of Directors a written demand requesting that the Board of Directors call a special meeting of the Company's stockholders for the purpose of voting on whether or not to exempt such Qualifying Offer from the terms of the Rights Agreement. Such a special meeting may be requested not earlier than 70 nor later than 90 business days following the commencement of a Qualifying Offer. If the Board of Directors has received a demand for such a special meeting that is proper and timely pursuant to the terms of the Rights Agreement, such special meeting shall be convened within 180 business days following commencement of the Qualifying Offer. If such special meeting is not convened within such 180 business day period or at such special meeting, holders of a majority of the voting power of shares of Common Stock entitled to vote thereon vote in favor of exempting the Qualifying Offer, then the Qualifying Offer shall be deemed exempt from the Rights Agreement as of such 180th business day or the date on which the results of such special meeting are certified. In any event, upon the effective date of the exemption of the Rights, the right to exercise the Rights with respect to the Qualifying Offer will terminate.

For purposes of the Rights Agreement, a "Qualifying Offer" is defined generally as a fully financed all-cash tender offer or an exchange offer for common stock of the offeror, or a combination thereof, in each case for all of the outstanding shares of Common Stock at the same per-share consideration, that is determined to have the following characteristics, among other things: (a) is commenced under certain rules of the Securities Exchange Act of 1934, as amended; (b) meets certain price requirements; (c) does not result in an investment banking firm issuing an inadequacy opinion; (d) if it is an exchange offer, permits due diligence of the offeror by the Company's representatives and after such due diligence an investment banking firm issues an opinion stating that the offer is fair from a financial point of view; (e) does not require due diligence of the Company; (f) will remain open for a certain period of time or longer if there is any increase in the consideration offered or if any bona fide alternative offer is commenced; (g) is conditioned on the tender of at least a majority of the voting power of the outstanding shares of Common Stock not held by the offeror; (h) the offeror has committed to consummate a second step transaction to acquire, at the same consideration, any shares not tendered; (i) may not be amended in a way adverse to a tendering stockholder; (j) certain facts and representations are certified by the offeror and the offeror's Chief Executive Officer and Chief Financial Officer; and (k) if it is an exchange offer, the offeror's common stock meets certain requirements. For purposes of the Rights Agreement, "fully financed" means that the offeror has sufficient funds for the offer and related expenses, which shall be evidenced as indicated in the Rights Agreement.

Redemption and Amendment

The Rights may be redeemed in whole, but not in part, at a price of $0.01 per Right (the "*Redemption Price*") by the Board of Directors at any time prior to the time that an Acquiring Person has become such. The redemption of the Rights may be made effective at such time, on such basis and with such conditions as the Board of Directors in its sole discretion may establish. Immediately upon any redemption of the Rights, the right to exercise the Rights will terminate and the only right of the holders of Rights will be to receive the Redemption Price.

Until a Right is exercised, the holder thereof, as such, will have no rights as a stockholder of the Company beyond those as an existing stockholder, including, without limitation, the right to vote or to receive dividends.

Any of the provisions of the Rights Agreement may be amended by the Board of Directors of the Company, or a duly authorized committee thereof, for so long as the Rights are then redeemable, and after the Rights are no longer redeemable, the Company may amend or supplement the Rights Agreement in any manner that does not adversely affect the interests of the holders of the Rights (other than an Acquiring Person or any affiliate or associate of an Acquiring Person).

Anti-Takeover Effects

The Rights are designed to assure that all of the Company's stockholders receive fair and equal treatment in the event of any proposed takeover of the Company and to guard against partial tender offers, open market accumulations and other abusive or coercive tactics to gain control of the Company without paying all stockholders a control premium. The Rights will cause substantial dilution to a person or group that acquires 10% (20% or more in the case of a passive institutional investor) or more of the Common Stock on terms not approved by the Company's Board of Directors. The Rights should not interfere with any merger or other business combination approved by the Board of Directors at any time prior to the first date that a person or group has become an Acquiring Person.

Additional Anti-Takeover Considerations

In addition to the items described above, the following provisions of our Certificate of Incorporation and Bylaws could be deemed to have an anti-takeover effect and could delay, defer or prevent a takeover attempt that a stockholder might consider to be in the stockholders' best interests.

- *Advance notice of director nominations and matters to be acted upon at meetings.* Our Bylaws contain advance notice requirements for nominations for directors to our Board of Directors and for proposing matters that can be acted upon by stockholders at stockholder meetings.
- *Board size*. Our Bylaws provide that the number of directors that shall constitute the whole Board of Directors shall be determined from time to time by resolution of the Board of Directors, and any vacancy in the Board of Directors, however occurring, including a vacancy resulting from an enlargement of the Board, shall be filled only by vote of a majority of the directors then in office, although less than a quorum, or by a sole remaining director.
- *Special Meetings of Stockholders*. Our Certificate of Incorporation provides that special meetings of stockholders for any purpose or purposes may be called at any time by the holders of at least twenty-five percent (25%) of the outstanding voting stock of the Company, a majority of the Board of Directors, the Chairman of the Board or the Chief Executive Officer, but such special meetings may not be called by any other person or persons.
- *Preferred Stock*. Preferred Stock may be issued with terms that have the effect of delaying, deferring or preventing a change in our control or making it more difficult to remove our management.

We are subject to Section 203 of the DGCL (“Section 203”). Under Section 203 a corporation is prohibited from engaging in any business combination with an interested stockholder who, together with its affiliates or associates, owns, or who is an affiliate or associate of the corporation and within a three-year period did own, 15% or more of the corporation’s voting stock for a three-year period following the time the stockholder became an interested stockholder, unless:

- prior to the time the stockholder became an interested stockholder, the board of directors of the corporation approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;
- the interested stockholder owned at least 85% of the voting stock of the corporation, excluding specified shares, upon consummation of the transaction which resulted in the stockholder becoming an interested stockholder; or
- at or subsequent to the time the stockholder became an interested stockholder, the business combination is approved by the board of directors of the corporation and authorized by the affirmative vote, at an annual or special meeting and not by written consent, of at least 66 2/3% of the outstanding voting shares of the corporation, excluding shares held by that interested stockholder.

A business combination generally includes:

- mergers, consolidations and sales or other dispositions of 10% or more of the assets of a corporation to or with an interested stockholder;
- specified transactions resulting in the issuance or transfer to an interested stockholder of any capital stock of the corporation or its subsidiaries; and
- other transactions resulting in a disproportionate financial benefit to an interested stockholder.

The provisions of Section 203 do not apply to a corporation if, subject to requirements set forth in the statute, the certificate of incorporation or bylaws of the corporation contain a provision expressly electing not to be governed by the provisions of the statute or the corporation does not have voting stock listed on a national securities exchange, authorized for quotation on an inter-dealer quotation system of a registered national securities association or held of record by more than 2,000 stockholders.

We have not adopted any provision in our Certificate of Incorporation or Bylaws to “opt-out” of Section 203, which will be applicable to business combinations involving us.

LONG TERM INCENTIVE PLAN
PERFORMANCE PERIOD 2019-2021

Spok 2019 Long Term Incentive Plan (LTIP) Payout Scale
Based on LRP_18

(Wireless Revenue - 20%; Software Revenue - 20%)
(Software Operations Bookings - 30%; Operating & Capital Expenses - 30%)

Wireless Revenue (20%) ($ in millions)			
	Result	Performance	Payout
Over Perform	$251.832	110.0%	130.0%
	$240.385	105.0%	120.0%
	$234.662	102.5%	110.0%
	$231.228	101.0%	105.0%
Target	**$228.939**	**100.0%**	**100.0%**
Under Perform	$217.492	95.0%	95.0%
	$206.045	90.0%	90.0%
	$194.598	85.0%	85.0%
	$183.151	80.0%	80.0%
	< $183.151	< 80.0%	0.0%

Software Revenue (20%) ($ in millions)			
	Result	Performance	Payout
Over Perform	$301.963	110.0%	130.0%
	$288.237	105.0%	120.0%
	$281.374	102.5%	110.0%
	$277.257	101.0%	105.0%
Target	**$274.512**	**100.0%**	**100.0%**
Under Perform	$260.786	95.0%	95.0%
	$247.060	90.0%	90.0%
	$233.335	85.0%	85.0%
	$219.61	80.0%	80.0%
	$205.88	75.0%	75.0%
	$192.16	70.0%	70.0%
	$178.43	65.0%	65.0%
	$164.71	60.0%	60.0%
	$150.98	55.0%	55.0%
	$137.26	50.0%	50.0%
	$123.53	45.0%	45.0%
	$109.80	40.0%	40.0%
	$96.08	35.0%	35.0%
	$82.35	30.0%	30.0%
	$68.63	25.0%	25.0%
	$54.90	20.0%	20.0%
	$41.18	15.0%	15.0%
	$27.45	10.0%	10.0%
	$13.73	5.0%	5.0%
	$0.00	0.0%	0.0%
	< $0	< 0.0%	0.0%

Operating and Capital Expenses (30%) (1) ($ in millions)			
	Result	Performance	Payout
Over Perform	$398.355	80.0%	125.0%
	$423.252	85.0%	120.0%
	$448.149	90.0%	115.0%
	$473.046	95.0%	107.5%
Target	**$497.943**	**100.0%**	**100.0%**
Under Perform	$522.840	105.0%	95.0%
	$547.738	110.0%	90.0%
	$572.635	115.0%	85.0%
	$597.532	120.0%	80.0%
	> $597.532	> 120.0%	0.0%

Operations Bookings (30%) ($ in millions)			
	Result	Performance	Payout
Over Perform	$165.000	110.0%	150.0%
	$157.500	105.0%	137.5%
	$153.750	102.5%	125.0%
	$151.50	101.0%	112.5%
Target	**$150.000**	**100.0%**	**100.0%**
Under Perform	$142.500	95.0%	95.0%
	$135.000	90.0%	90.0%
	$127.500	85.0%	85.0%
	$120.00	80.0%	80.0%
	$112.50	75.0%	75.0%
	$105.00	70.0%	70.0%
	$97.50	65.0%	65.0%
	$90.00	60.0%	60.0%
	$82.50	55.0%	55.0%
	$75.00	50.0%	50.0%
	$67.50	45.0%	45.0%
	$60.00	40.0%	40.0%
	$52.50	35.0%	35.0%
	$45.00	30.0%	30.0%
	$37.50	25.0%	25.0%
	$30.00	20.0%	20.0%
	$22.50	15.0%	15.0%
	$15.00	10.0%	10.0%
	$7.50	5.0%	5.0%
	$0.00	0.0%	0.0%
	< $0	< 0.0%	0.0%

(1) Operating and Capital Expenses excludes severance and stock based compensation expense.

Amount is calculated as follows:		2019	2020	2021	Total
Operating Expenses		$ 160,186	$ 166,395	$ 173,334	$ 499,915
Capital Expenses		4,990	4,703	4,492	14,184
Add Back-	Severance	(206)	(42)	(42)	(289)
	Stock Based Compensation	(5,173)	(5,325)	(5,369)	(15,867)
Operating and Capital Expenses		$ 159,797	$ 165,732	$ 172,415	$ 497,943
Wireless Revenue		$ 84,915	$ 75,862	$ 68,162	$ 228,939
Software Revenue		$ 80,329	$ 90,639	$ 103,544	$ 274,512
Operations Bookings		$ 42,000	$ 48,000	$ 60,000	$ 150,000

Exhibit 10.15

Spok Holdings, Inc.
2022 Short-Term Incentive Plan
(Effective February 17, 2022)

I. Effective Date. The 2022 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 January 26. 2022. The Plan is effective as of February 17, 2022 and supersedes and replaces all former management short-term incentive plans, including the Spok Holdings, Inc., 2021 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, 2022 (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, 2022. 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, 2022 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, 2022 but before October 1, 2022 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, 2022 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, 2022 (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 2022 annual audit of the Parent's consolidated financial statement has been completed and the Parent's 2022 Annual Report on Form 10-K has been filed with the Securities and Exchange Commission but in no event later than December 31, 2023.

b. If the Participant involuntarily Separates from Service without Cause or due to disability or dies prior to December 31, 2022, 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, 2022 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. Change in Control. Notwithstanding anything herein to the contrary, upon the occurrence of a Change in Control (as defined in the Company's 2020 Equity Incentive Award Plan) prior to the end of the Performance Period, each Participant who remains employed with the Company through the date of the Change in Control will receive a cash payment equal to his or her target bonus amount multiplied by a fraction, the numerator of which is the number of days elapsed from January 1, 2022 (or if later the date of the Participant's commencement of employment) through the date of the Change in Control and the denominator of which is 365. Following payment of such amount, this Plan will terminate, and no further payments will be made hereunder, unless otherwise determined by the Compensation Committee.

d. 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 February 17, 2022.

SPOK HOLDINGS, INC.

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

Exhibit 10.15

Exhibit 23

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We have issued our reports dated February 17, 2022, 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, 2021. 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, File No. 333-212724 and File No. 333-240213).

/s/ GRANT THORNTON LLP

Arlington, Virginia
February 17, 2022

Exhibit 31.1

CERTIFICATION PURSUANT TO RULE 13A-14(A) OR 15D-14(A)
OF THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Vincent D. Kelly, certify that:

1. I have reviewed this Annual Report on Form 10-K of Spok 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.

Date: February 17, 2022

/s/ Vincent D. Kelly
Vincent D. Kelly
President and Chief Executive Officer

Exhibit 31.2

CERTIFICATION PURSUANT TO RULE 13A-14(A) OR 15D-14(A)
OF THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Michael W. Wallace, certify that:

1. I have reviewed this Annual Report on Form 10-K of Spok 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.

Date: February 17, 2022

/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, 2021 (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 17, 2022

/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 Spok 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, 2021 (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 17, 2022

/s/ Michael W. Wallace
Michael W. Wallace
Chief Financial Officer