FEDERAL SIGNAL CORP /DE/
Form 10-K
February 28, 2019
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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K
(Mark One)
þ ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2018
OR
¨ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the transition period from to
Commission File Number 1-6003
FEDERAL SIGNAL CORPORATION
(Exact name of registrant as specified in its charter)

Delaware	36-1063330
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
1415 West 22nd Street, Oak Brook, Illinois	60523
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code (630) 954-2000
Securities registered pursuant to Section 12(b) of the Act:

Title of Each Class	Name of Each Exchange on Which Registered
Common Stock, par value $1.00 per share	New York Stock Exchange

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 þ 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 þ
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 þ 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 shorter period that the registrant was required to submit and post such files). Yes þ No ¨
Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§ 229.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ¨

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, 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	þ	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 is a shell company (as defined in Rule 12b-2 of the Act). Yes ¨ No þ

As of June 30, 2018, the aggregate market value of voting stock held by non-affiliates was $1,371,933,852. For purposes of the foregoing calculation only, executive officers and directors of the registrant have been deemed to be affiliates.

As of January 31, 2019, the number of shares outstanding of the registrant’s common stock was 60,148,935.

Documents Incorporated By Reference

Portions of the registrant’s definitive proxy statement for the 2019 Annual Meeting of Stockholders are incorporated by reference in Part III.

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FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K ("Form 10-K") is being filed by Federal Signal Corporation and its subsidiaries (referred to collectively as the "Company," "we," "our" or "us" herein, unless the context otherwise indicates) with the United States ("U.S.") Securities and Exchange Commission (the "SEC"), and includes comments made by management that may contain words such as "may," "will," "believe," "expect," "anticipate," "intend," "plan," "project," "estimate" and "objective" terminology, or the negative thereof, concerning the Company's future financial performance, business strategy, plans, goals and objectives. These expressions are intended to identify forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the "Securities Act"), Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act") and the Private Securities Litigation Reform Act of 1995.

Forward-looking statements include information concerning the Company's possible or assumed future performance or results of operations and are not guarantees. While these statements are based on assumptions and judgments that management has made in light of industry experience as well as perceptions of historical trends, current conditions, expected future developments and other factors believed to be appropriate under the circumstances, they are subject to risks, uncertainties and other factors that may cause the Company's actual results, performance or achievements to be materially different.

These risks and uncertainties, some of which are beyond the Company's control, include, but are not limited to, the risk factors described under Item 1A, Risk Factors as set forth in Part I, as well as those discussed elsewhere in this Form 10-K. These factors may not constitute all factors that could cause actual results to differ materially from those discussed in any forward-looking statement. The Company operates in a continually changing business environment and new factors emerge from time to time. The Company cannot predict such factors, nor can it assess the impact, if any, of such factors on its results of operations, financial condition or cash flow. Accordingly, forward-looking statements should not be relied upon as a predictor of actual results. The Company disclaims any responsibility to update any forward-looking statement provided in this Form 10-K.

ADDITIONAL INFORMATION

The Company is subject to the reporting and information requirements of the Exchange Act and, as a result, is obligated to file Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and other reports and information with the SEC, as well as amendments to those reports. The Company makes these filings available free of charge through our website at www.federalsignal.com as soon as reasonably practicable after such materials are filed with, or furnished to, the SEC. Information on our website does not constitute part of this Form 10-K. In addition, the SEC maintains a website at www.sec.gov that contains reports, proxy and information statements and other information regarding issuers that file electronically.

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PART I

Item 1. Business.

Federal Signal Corporation, founded in 1901, was reincorporated as a Delaware corporation in 1969. The Company designs, manufactures and supplies a suite of products and integrated solutions for municipal, governmental, industrial and commercial customers. The Company's portfolio of products that it manufactures includes sewer cleaners, vacuum trucks, street sweepers, waterblasters, dump truck bodies, trailers, and safety and security systems, including technology-based products and solutions for the public safety market. In addition, we sell parts and provide service, repair, equipment rentals and training as part of a comprehensive aftermarket offering to our customers. Federal Signal Corporation and its subsidiaries operate 14 principal manufacturing facilities in five countries and provide products and integrated solutions to customers in all regions of the world.

Narrative Description of Business

Products manufactured and supplied, and services rendered, by the Company are divided into two reportable segments: the Environmental Solutions Group and the Safety and Security Systems Group. The individual operating businesses are organized as such because they share certain characteristics, including technology, marketing, distribution and product application, which create long-term synergies. Corporate contains those items that are not included in our reportable segments.

Financial information concerning the Company's two reportable segments for each of the three years in the period ended December 31, 2018, is included in Note 16 – Segment Information to the accompanying consolidated financial statements and is incorporated herein by reference. Information regarding the Company's discontinued operations is included in Note 18 – Discontinued Operations to the accompanying consolidated financial statements and is incorporated herein by reference.

Environmental Solutions Group

Our Environmental Solutions Group is a leading manufacturer and supplier of a full range of street sweeper vehicles, sewer cleaner and vacuum loader trucks, hydro-excavation trucks, high-performance waterblasting equipment, dump truck bodies and trailers. The Group manufactures vehicles and equipment in the U.S. and Canada that are sold under the Elgin®, Vactor®, Guzzler®, Westech™, Jetstream®, Ox Bodies®, Crysteel®, J-Craft®, Duraclass®, Rugby® and Travis® brand names. Products are sold to both municipal and industrial customers either through a dealer network or direct sales to service customers generally depending on the type and geographic location of the customer. The acquisition of substantially all of the assets and operations of Joe Johnson Equipment, Inc. and Joe Johnson Equipment (USA), Inc. (collectively, "JJE") in 2016 extended the Environmental Solutions Group's existing sales channel and increased the number of service centers through which its parts, service and rental offerings can be provided to current and potential customers. The acquisition of JJE also broadened the Environmental Solutions Group's product offerings to include other products, such as refuse and recycling collection vehicles, camera systems, ice resurfacing equipment and snow-removal equipment. In addition to vehicle and equipment sales, the Group also engages in the sale of parts, service and repair, equipment rentals and training as part of a complete offering to its current and potential customers through its service centers located across North America.

Under the Elgin brand name, the Company sells a leading U.S. brand of street sweepers primarily designed for large-scale cleaning of curbed streets, parking lots and other paved surfaces utilizing mechanical sweeping, vacuum and recirculating air technology. Vactor is a leading manufacturer of vacuum trucks used to maintain sewer lines, catch basins and storm sewers, as well as hydro-excavation trucks to meet the need for safe and non-destructive excavation. Guzzler is a leader in industrial vacuum loaders used to manage industrial waste or recover and recycle valuable raw materials. Westech is a manufacturer of high-quality, rugged vacuum trucks. Jetstream manufactures high pressure waterblast equipment and accessories for commercial and industrial cleaning and maintenance operations. The Company manufactures and sells dump truck bodies and trailers under the Ox Bodies, Crysteel, J-Craft, Duraclass, Rugby and Travis brand names.

Safety and Security Systems Group

Our Safety and Security Systems Group is a leading manufacturer and supplier of comprehensive systems and products that law enforcement, fire rescue, emergency medical services, campuses, military facilities and industrial sites use to protect people and property. Offerings include systems for campus and community alerting, emergency vehicles, first responder interoperable communications and industrial communications, as well as municipal networked security. Specific products include vehicle lightbars and sirens, public warning sirens, general alarm systems, public address systems and public safety software. Products are sold under the Federal Signal™, Federal Signal VAMA® and Victor® brand names. The Group operates manufacturing facilities in the U.S., Europe and South Africa.

Marketing and Distribution

Depending primarily on the type and geographic location of the end-customer, the Environmental Solutions Group uses either a dealer network, including JJE, or direct sales to serve customers. The 2017 acquisition of Truck Bodies and Equipment International ("TBEI") increased the number of dealers within our network and also added additional direct sales resources. The dealer network serves both municipal and industrial end markets. Within municipal markets, the majority of our dealers operate exclusively in their assigned territory. In conjunction with selling vehicles to end-customers, dealer representatives demonstrate vehicle functionality and capability and provide vehicle service. In addition to selling products manufactured by the Company, JJE distributes and re-sells products manufactured by other companies. The Company believes its regional, national and global dealer networks for vehicles is a distinguishing factor from its competitors. The Environmental Solutions Group's direct sales channel concentrates on the industrial, utility and construction market segments, and the service centers provide post-sale service, ancillary parts and equipment rentals. The acquisition of JJE increased the number of service centers through which its parts, service and rental offerings can be provided to current and potential customers.

The Safety and Security Systems Group sells to industrial customers through wholesalers and distributors who are supported by Company sales personnel or independent manufacturer representatives. Products are also sold to municipal and governmental customers through active independent distributors, as well as through original equipment manufacturers and the direct sales force. The Company sells comprehensive integrated warning and interoperable communications through a combination of the direct sales force and independent distributors. International sales are made through independent foreign distributors or on a direct basis.

Customers and Backlog

No single customer accounted for 10% or more of the Company's net sales in any year within the three-year period ended December 31, 2018. Of the $1,173.2 million total orders reported in 2018, approximately 31% were from U.S. municipal and governmental customers, 47% were from U.S. commercial and industrial customers and 22% were from non-U.S. customers.

During 2018, the Company's U.S. municipal and governmental orders increased by 3% compared to 2017 levels, primarily due to improved orders for sewer cleaners and public safety products, partially offset by lower orders for outdoor warning systems. During 2017, the Company's U.S. municipal and governmental orders increased by 18% compared to 2016 levels, driven by improved orders for street sweepers and sewer cleaners, as well as additional orders for dump truck bodies following the acquisition of TBEI.

During 2018, the Company's U.S. industrial and commercial orders increased by 29% from 2017 levels, largely attributable to improved orders for vacuum trucks, the effects of a full year of TBEI orders in 2018 compared to seven months of activity in 2017, and increased orders for outdoor warning systems within the Safety and Security Systems Group. During 2017, the Company's U.S. commercial and industrial orders increased by 140% from 2016 levels, largely attributable to improved orders for sewer cleaners and vacuum trucks, the addition of orders following the TBEI acquisition, the effects of a full year of JJE orders in 2017 compared to seven months of activity in 2016, and increased orders from industrial markets within the Safety and Security Systems Group.

During 2018, the Company's non-U.S. orders increased by 8% from 2017, largely due to a $7.8 million increase within the Environmental Solutions Group, reflecting increased orders for vacuum trucks, sewer cleaners and street sweepers, as well as the effects of higher aftermarket demand. These increases were partially offset by lower orders for refuse trucks. Within the Safety and Security Systems Group, non-U.S. orders increased by $11.7 million, driven by improved orders from international public safety markets. During 2017, the Company's non-U.S. orders increased by 21% from 2016, largely due to a $35.6 million increase within the Environmental Solutions Group, reflecting increased Canadian orders following the acquisition of JJE in June of 2016. Within the Safety and Security Systems Group, non-U.S. orders increased by $5.2 million, driven by improved orders in industrial and coal markets, partially offset by reduced orders from international public safety markets.

Of the Company's non-U.S. orders received in 2018, approximately 62% were from Canada, 19% were from Europe and less than 10% were from any other particular region. Non-U.S. municipal and governmental markets are similar to

the U.S. municipal and governmental markets in that they are largely dependent on tax revenues to support spending and orders may be subject to budgetary cycles and public-entity bid procedures.

The Company's backlog totaled $337.7 million at December 31, 2018 compared to $257.5 million at December 31, 2017. The increase of $80.2 million, or 31%, was attributable to higher demand for vacuum trucks, sewer cleaners and street sweepers. Backlogs vary by group due to the nature of the Company's products and the buying patterns of its customers. TBEI's product lines typically experience average lead times ranging from one to three months. Following the acquisition of TBEI, the Environmental Solutions Group typically experiences an average backlog of approximately three to six months of shipments.

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The Safety and Security Systems Group typically experiences an average backlog of approximately two months of shipments. Production of the Company’s December 31, 2018 backlog is expected to be substantially completed during 2019.

Suppliers

The Company purchases a wide variety of raw materials from around the world for use in the manufacture of its products, although the majority of current purchases are from North American sources. To minimize risks relating to availability, price and quality of key products and components, the Company is party to numerous strategic supplier arrangements. Although certain materials are obtained from either a single-source supplier or a limited number of suppliers, the Company has generally identified alternative sources to minimize the interruption of its business in the event of supply disruptions.

Components critical to the production of the Company’s vehicles, such as engines, are purchased from a select number of suppliers. The Company also purchases raw and fabricated steel, as well as commercial chassis, from multiple sources. In addition, we may incorporate chassis provided directly by our customers in our production process. As a distributor of equipment manufactured by other companies, JJE relies on the availability of equipment supplied by others to meet customer demand.

While there are risks and uncertainties with respect to the supply of certain raw materials and components that could impact price, quality and availability in sufficient quantities, the Company believes it has adequate supplies and sources of availability of the raw materials and components necessary to meet its needs.

Competition

Within the Environmental Solutions Group, Elgin is recognized as a market leader among domestic sweeper competitors and differentiates itself primarily on product performance. The Vactor and Guzzler brands each maintain a leading domestic position in their respective marketplaces by enhancing product performance with leading technology and application flexibility. Jetstream is a market leader in the in-plant cleaning segment of the U.S. waterblast industry, competing on product performance, rapid delivery and solutions services. JJE is a leading Canadian-based distributor of maintenance equipment for municipal and industrial markets. TBEI includes a portfolio of regional brands with market leadership positions in distinct geographies and product categories, differentiating itself with its broad regional distribution network, focus on customer responsiveness and operational expertise.

Within specific product categories and domestic markets, the businesses within the Safety and Security Systems Group are among the market leaders. The Group’s international market position varies from leader to ancillary participant depending on the geographic region and product line. Generally, competition is intense within all of the Group’s product lines and purchase decisions are made based on price, features, reputation, performance and service, often within competitive bidding situations.

Patents and Trademarks

The Company owns a number of patents and possesses rights under others to which it attaches importance, but it does not believe that its business as a whole is materially dependent upon any such patents or rights. The Company also owns a number of trademarks, including those listed within the “Narrative Description of Business” section above. We believe these trademarks are important in connection with the identification of our products and associated goodwill with customers, but no material part of the Company’s business is dependent on our trademarks.

Employees

The Company employed approximately 3,300 people in its businesses at December 31, 2018, with the Company’s U.S. hourly workers accounting for approximately 52% of its total workforce. Approximately 17% of the Company’s U.S. hourly workers were represented by unions at December 31, 2018. The Company believes that its labor relations with its employees are good.

Governmental Regulation of the Environment

The Company believes it complies with federal, state and local provisions that have been enacted or adopted regulating the discharge of materials into the environment, or otherwise relating to the protection of the environment. The Company endeavors to establish environmentally-friendly policies and objectives, and believes that these actions

are also consistent with cost-effective operating practices. Capital expenditures in 2018 attributable to compliance with such laws were not material. The Company believes that the overall impact of compliance with environmental regulations will not have a material adverse effect on our financial position, results of operations or cash flow.

In May 2012, the Company sold a facility in Pearland, Texas. The facility was previously used by the Company’s discontinued Pauluhn business, which manufactured marine, offshore and industrial lighting products. As of December 31, 2018 and 2017,

$0.4 million and $0.5 million, respectively, of reserves related to the environmental remediation of the Pearland facility have been included in liabilities of discontinued operations on the Consolidated Balance Sheets. The Company's estimate may change as more information becomes available; however, the costs are not expected to have a material adverse effect on the Company's results of operations, financial position or cash flow.

Seasonality

Certain of the Company's businesses are susceptible to the influences of seasonal factors, including buying patterns, delivery patterns and productivity influences from holiday periods and weather. In general, the Company tends to have lower equipment sales in the first calendar quarter of each year compared to other quarters as a result of these factors. In addition, rental income and parts sales are generally higher in the second and third quarters of the year, because many of the Company's products are used for maintenance activities in North America, where usage is typically lower during periods of harsher weather conditions.

Executive Officers of the Registrant

The following is a list of the Company's executive officers, their ages, business experience and positions as of February 1, 2019:

Jennifer L. Sherman, age 54, was appointed President and Chief Executive Officer effective January 1, 2016. Ms. Sherman was also appointed to the Board of Directors effective January 1, 2016. Since joining the Company in 1994, Ms. Sherman has served in various roles of increasing responsibility, most recently as Senior Vice President and Chief Operating Officer from April 2014 to December 31, 2015. Ms. Sherman also previously served as Senior Vice President, Chief Administrative Officer, General Counsel and Secretary from 2010 to April 2014, Senior Vice President, Human Resources, General Counsel and Secretary from 2008 to 2010, and Vice President, General Counsel and Secretary from 2004 to 2008.

Daniel A. DuPré, age 62, was appointed Vice President, General Counsel and Secretary in November 2015. Mr. DuPré joined the Company in 2006, most recently serving as its Deputy General Counsel. Mr. DuPré previously held senior legal positions at Sears Holdings Corporation, Bank One Corporation, and Brunswick Corporation and served as an Assistant United States Attorney for the Northern District of Illinois.

Lauren B. Elting, age 37, was appointed Vice President and Corporate Controller in May 2018. Prior to joining the Company in January 2017, Ms. Elting worked at Ernst & Young LLP from 2004 to 2016, most recently as Senior Audit Manager.

Robert E. Fines, age 60, was appointed Vice President and General Manager of TBEI in June 2017, following the Company's acquisition of TBEI, where Mr. Fines had served as Chief Executive Officer since 2008. Prior to joining TBEI, Mr. Fines held senior management positions at Kirtland Capital, Avery Dennison and GE Plastics.

Ian A. Hudson, age 42, was appointed Senior Vice President and Chief Financial Officer in October 2017. Mr. Hudson joined the Company in August 2013 as Vice President and Corporate Controller. Prior to joining the Company, Mr. Hudson served as Director of Accounting – Latin America and Asia Pacific at Groupon, Inc. from June 2012 to August 2013. Prior to that role, Mr. Hudson worked at Ernst & Young, LLP from 1998 to 2012, most recently as Senior Audit Manager.

Svetlana Vinokur, age 39, was appointed Vice President, Treasurer and Corporate Development in April 2015. Prior to joining the Company, Ms. Vinokur worked as Assistant Treasurer at Illinois Tool Works Inc. Prior to that role, Ms. Vinokur served as Finance Head of M&A Strategy at Mead Johnson Nutrition Company and as a senior associate for Robert W. Baird & Company's Consumer and Industrial Investment Banking group. Ms. Vinokur started her career at Ford Motor Company, serving in various finance roles.

Mark D. Weber, age 61, was appointed Senior Vice President and Chief Operating Officer in January 2018, upon rejoining the Company after four years at Supreme Industries, Inc. ("Supreme"). Mr. Weber joined Supreme in May 2013 as President and Chief Executive Officer, serving in that capacity up to the sale of Supreme to Wabash National Corporation, which was completed in September 2017. Prior to joining Supreme, Mr. Weber worked for 17 years as an executive within the Company's Environmental Solutions Group, including a decade as Group President.

These officers hold office until the next annual meeting of the Board of Directors following their election and until their successors have been elected and qualified.
There are no family relationships among any of the foregoing executive officers.

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Item 1A. Risk Factors.

We may occasionally make forward-looking statements and estimates such as forecasts and projections of our future performance or statements of our plans and objectives. These forward-looking statements may be contained in, but are not limited to, filings with the SEC, including this Form 10-K, press releases made by us and oral statements made by our officers. Actual results could differ materially from those contained in such forward-looking statements. Important factors that could cause our actual results to differ from those contained in such forward-looking statements include, but are not limited to, the risks described below.

Our financial results are subject to U.S. economic uncertainty.

In 2018, we generated approximately 78% of our net sales in the U.S. Our ability to be profitable depends heavily on varying conditions in the U.S. governmental and municipal markets, as well as the overall U.S. economy. The industrial markets in which we compete are subject to considerable cyclicality, and move in response to cycles in the overall business environment. Many of our customers are municipal government agencies, and as a result, we are dependent on municipal government spending. Spending by our municipal customers can be affected by federal, state and local political circumstances, budgetary constraints, changing priorities, actual or potential government shutdowns and other factors. The U.S. government and municipalities depend heavily on tax revenues as a source of spending and accordingly, there is a historical correlation that suggests a lag of one to two years between the condition of the U.S. economy and our sales to the U.S. government and municipalities. Therefore, downturns in the U.S. economy are likely to result in decreases in demand for our products. During previous economic downturns, we experienced decreases in sales and profitability, and we expect our business to remain subject to similar economic fluctuations in the future. In addition, the Tax Cuts and Jobs Act of 2017 (the “2017 Tax Act”) may result in changes in federal, state and local tax revenues which could impact governmental spending and demand for our products.

We have international operations that are subject to compliance with domestic and foreign laws and regulations, economic and political uncertainties and foreign currency rate fluctuations.

Our business is subject to fluctuations in demand and changing international economic, legal and political conditions that are beyond our control. In 2018, approximately 22% of our net sales were to customers outside the U.S. and we expect a significant portion of our revenues to come from international sales in the foreseeable future. Operating in the international marketplace exposes us to a number of risks, including the need to comply with U.S. and foreign laws and regulations applicable to our foreign operations, such as the Foreign Corrupt Practices Act, the United Kingdom (“U.K.”) Bribery Act and their counterparts in other foreign jurisdictions in which we operate, restrictive domestic and international trade regulations, changes in these laws, regulations and policies by the U.S. and foreign governments. In addition, we may be exposed to risks associated with actual or threatened imposition of tariffs or trade barriers on our products or materials incorporated into our products, actual or threatened trade disputes, including so-called “trade wars,” political and economic instability in the jurisdictions in which we operate, foreign receivables collection risk, local labor market conditions, and, in some cases, international hostilities. The costs of compliance with these various laws, regulations and policies can be significant and penalties for non-compliance could significantly impact our business.

To the extent that our international operations are affected by adverse foreign economic or political conditions, we may experience disruptions and losses which could have a material impact on our financial position, results of operations or cash flow. To mitigate the risk of foreign receivables collection, we may obtain letters of credit from international customers to satisfy concerns regarding the collectability of amounts billed to customers.

Some of our contracts are denominated in foreign currencies, which may expose us to risks of fluctuating currency values and exchange rates, hard currency shortages and controls on currency exchange. Changes in the value of foreign currencies over the long term could increase our U.S. dollar costs for, or reduce our U.S. dollar revenues from, our foreign operations. Any increased costs or reduced revenues as a result of foreign currency fluctuations could adversely affect our results of operations.

We are subject to a number of restrictive debt covenants.

Our credit facility contains certain restrictive debt covenants and customary events of default. Our ability to comply with these restrictive covenants may be affected by the other factors described in this “Risk Factors” section, as well as other factors outside of our control. Failure to comply with one or more of these restrictive covenants may result in an event of default which, if not cured by us or waived by our lenders, allows our lenders to declare all amounts outstanding as due and payable. Such an acceleration of the maturity of our indebtedness may cause us to incur substantial costs and may prevent or limit us from engaging in transactions that benefit us, including responding to changing business and economic conditions and taking advantage of attractive business opportunities.

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The execution of our growth strategy is dependent upon the continued availability of credit and third-party financing arrangements for our customers.

Economic downturns result in tighter credit markets, which could adversely affect our customers' ability to secure financing or to secure financing at favorable terms or interest rates necessary to proceed or continue with purchases of our products and services. Our customers' or potential customers' inability to secure financing for projects could result in the delay, cancellation or downsizing of new purchases or the suspension of purchases already under contract, which could cause a decline in the demand for our products and services and negatively impact our financial position, results of operations or cash flow.

Our efforts to develop new products and services or enhance existing products and services involve substantial research, development and marketing expenses, and the resulting new or enhanced products or services may not generate sufficient revenues to justify the expense.

We place a high priority on developing new products and services, as well as enhancing our existing products and services. As a result of these efforts, we may be required to expend substantial research, development and marketing resources, and the time and expense required to develop a new product or service or enhance an existing product or service are difficult to predict. We may not succeed in developing, introducing or marketing new products or services or product or service enhancements. In addition, we cannot be certain that any new or enhanced product or service will generate sufficient revenue to justify the expense and resources devoted to the related product diversification effort.

We could incur restructuring and impairment charges as we continue to evaluate opportunities to restructure our business and rationalize our manufacturing operations in an effort to optimize our cost structure.

We continue to evaluate opportunities to restructure our business and rationalize our manufacturing operations in an effort to optimize our cost structure. These actions could result in significant charges that could adversely affect our financial condition and results of operations. Future actions could result in restructuring and related charges, including but not limited to impairments, employee termination costs and charges for pension and other postretirement contractual benefits and pension curtailments that could be significant and could have an adverse effect on our financial condition, results of operations or cash flow.

We operate in highly competitive markets.

The markets in which we operate are highly competitive. Many of our competitors have significantly greater financial resources than we do. The intensity of this competition, which is expected to continue, can result in price discounting and margin pressures throughout the industry and may adversely affect our ability to increase or maintain prices for our products. In addition, certain of our competitors may have lower overall labor or material costs. In some cases, our contracts with municipal and other governmental customers are awarded and renewed through competitive bidding. We may not be successful in obtaining or renewing these contracts, which could have an adverse effect on our financial condition, results of operations or cash flow.

We may incur material losses and costs as a result of lawsuits or claims that may be brought against us which are related to product liability, warranty, product recalls, client service interruptions or other matters.

We are exposed to product liability and warranty claims in the normal course of business in the event that our products actually or allegedly fail to perform as expected, or the use of our products results, or is alleged to result, in bodily injury and/or property damage. For example, we have been sued by firefighters seeking damages claiming that exposure to our sirens has impaired their hearing and that the sirens are, therefore, defective. In addition, we are subject to other claims and litigation from time to time as further described in the accompanying notes to our consolidated financial statements. We could experience material warranty or product liability costs in the future and incur significant costs to defend ourselves against these claims. While we carry insurance and maintain reserves for product liability claims, our insurance coverage may be inadequate if such claims do arise, and any defense costs and liability not covered by insurance could have a material adverse impact on our financial condition, results of operations or cash flow. A future claim could involve the imposition of punitive damages, the award of which, pursuant to state laws, may not be covered by insurance. In addition, warranty and certain other claims are not

typically covered by insurance. Any product liability or warranty issues may adversely impact our reputation as a manufacturer of high quality, safe products and may have a material adverse effect on our business.

Failure to keep pace with technological developments may adversely affect our operations.

We are engaged in an industry that will be affected by future technological developments. The introduction of products or processes utilizing new technologies could render our existing products or processes obsolete or unmarketable. Our success will depend upon our ability to develop and introduce on a timely and cost-effective basis new products, applications and

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processes that keep pace with technological developments and address increasingly sophisticated customer requirements. We may not be successful in identifying, developing and marketing new products, applications and processes and product or process enhancements. We may experience difficulties that could delay or prevent the successful development, introduction and marketing of product or process enhancements or new products, applications or processes. Our products, applications or processes may not adequately meet the requirements of the marketplace and achieve market acceptance. Our financial condition, results of operations or cash flow could be materially and adversely affected if we were to incur delays in developing new products, applications or processes or product or process enhancements, or if our products do not gain market acceptance.

Increased information technology security threats and more sophisticated cyber-attacks pose a risk to our systems, networks, products and operations.

We have observed a global increase in information technology security threats and more sophisticated cyber-attacks. Our business could be impacted by such disruptions, which in turn could pose a risk to the security of our systems and networks and the confidentiality, accessibility and integrity of information stored and transmitted on those systems and networks. We have adopted measures to address cyber-attacks and mitigate potential risks to our systems from these information technology-related disruptions. However, given the unpredictability of the timing, nature and scope of such disruptions, our systems and networks remain potentially vulnerable to attacks. Depending on their nature and scope, such attacks could potentially lead to the compromising of confidential information, misuse of our systems and networks, manipulation and destruction of data, misappropriation of assets or production stoppages and supply shortages, which in turn could adversely affect our reputation, financial condition, results of operations or cash flow.

Infringement of, or an inability to protect, our intellectual property rights could adversely affect our business.

We rely on a combination of patents, trademarks, copyrights, nondisclosure agreements, information technology security systems, physical security and other measures to protect our proprietary intellectual property and the intellectual property of certain customers and suppliers. However, we cannot be certain that our efforts to protect these intellectual property rights will be sufficient. Intellectual property protection is subject to applicable laws in various jurisdictions where interpretations and protections differ or can be unpredictable and costly to enforce. Further, our ability to protect our intellectual property rights may be limited in certain foreign jurisdictions that do not have, or do not enforce, strong intellectual property rights. Any failure to protect or enforce our intellectual property rights could have a material adverse effect on our competitive position, financial condition, results of operations or cash flow.

The inability to obtain raw materials, component parts and/or finished goods in a timely and cost-effective manner would adversely affect our ability to manufacture and market our products.

We purchase from suppliers raw materials, component parts and finished goods to be used in the manufacturing and sale of our products. In addition, we may incorporate vehicle chassis provided directly by our customers in our production process. Changes in our relationships with suppliers, shortages or production delays, whether due to our suppliers or customers, regulatory restrictions or work stoppages by the employees of our suppliers or the chassis suppliers for our customers could have a material adverse effect on our ability to timely manufacture and market products. In addition, increases in the costs of purchased raw materials, component parts or finished goods could result in manufacturing interruptions, delays, inefficiencies or our inability to market products. In addition, our profit margins would decrease if prices of purchased raw materials, component parts or finished goods increase and we are unable to pass on those increases to our customers.

Our ability to operate effectively could be impaired if we fail to attract and retain key personnel.

Our ability to operate our businesses and implement our strategies depends in part on the efforts of our executive officers and other key employees. In addition, our future success will depend on, among other factors, our ability to attract and retain qualified personnel. The loss of the services of any key employee or the failure to attract or retain other qualified personnel could have a material adverse effect on our business or business prospects.

Disruptions within our dealer network or the inability of our dealers to secure adequate access to capital could adversely affect our business.

We rely on national and global dealer networks to market certain of our products and services. A disruption in our dealer network, or with a significant dealer, or within a specific market, could have an adverse impact on our business within the affected market. In addition, our dealers require adequate liquidity to finance their operations, including purchases of our products. Dealers are subject to numerous risks and uncertainties that could unfavorably affect their liquidity positions, including, among other things, continued access to adequate financing sources on a timely basis on reasonable terms. These sources of financing are vital to our ability to sell products through our dealer network. Deterioration in the liquidity or credit worthiness of our dealers could have a significant adverse effect on our business. The loss or termination of a significant dealer,

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or a significant number of dealers, could cause difficulties in marketing and distributing our products and have an adverse effect on our business, financial condition, results of operations or cash flow.

Our business may be adversely impacted by work stoppages and other labor relations matters.

As a portion of our workforce is unionized, we are subject to risk of work stoppages and other labor relations matters. As of December 31, 2018, approximately 17% of our U.S. hourly workers were represented by labor unions and were covered by collective bargaining agreements with various unions. Many of these agreements include provisions that limit our ability to realize cost savings. Our current collective bargaining agreement with the International Brotherhood of Electrical Workers is due to expire in April 2019. Any strikes, threats of strikes or other organized disruptions in connection with the negotiation of new labor agreements or other negotiations could materially adversely affect our business as well as impair our ability to implement further measures to reduce costs and improve production efficiencies.

Our pension funding requirements and expenses are affected by certain factors outside of our control, including the performance of plan assets, the discount rate used to value liabilities, actuarial assumptions and experience and legal and regulatory changes.

Our funding obligations and pension expense for our defined benefit pension plans are driven by the performance of assets set aside in trusts for these plans, the discount rate used to value the plans' liabilities, actuarial assumptions and experience and legal and regulatory funding requirements. Changes in these factors could have an adverse impact on our financial condition, results of operations or cash flow. In addition, a portion of our pension plan assets are invested in equity securities, which can experience significant declines if financial markets weaken. The level of the funding of our defined benefit pension plan liabilities was approximately 79% as of December 31, 2018. Funding of the Company's U.S. defined benefit pension plan is determined in accordance with guidelines set forth in the Employee Retirement Income Security Act ("ERISA"). The current year funding status was impacted by a lower discount rate than in the prior year. Our future pension expenses and funding requirements could increase significantly due to the effect of adverse changes in the discount rate, asset values or the estimated expected return on plan assets. In addition, we could become legally required to make increased cash contributions to the pension plans, and these contributions could be material and negatively affect our cash flow.

The costs associated with complying with environmental and safety regulations could lower our margins.

We, like other manufacturers, continue to face heavy governmental regulation of our products, especially in the areas of the environment and employee health and safety. Complying with environmental and safety requirements has added and will continue to add to the cost of our products, and could increase the capital required to support our business. While we believe that we are in compliance in all material respects with these laws and regulations, we may be adversely impacted by costs, liabilities or claims with respect to our operations under existing laws or those that may be adopted. These requirements are complex, change frequently and have tended to become more stringent over time. Therefore, we could incur substantial costs, including cleanup costs, fines and civil or criminal sanctions as a result of violation of, or liabilities under, environmental laws and safety regulations. These requirements may increase the cost of our products, which may diminish demand for those products. In addition, uneven application of environmental or safety regulations could place our products at a cost or features disadvantage, which could reduce our revenues and profitability.

An impairment in the carrying value of goodwill, intangible assets or long-lived assets could negatively affect our financial position and results of operations.

As of December 31, 2018, goodwill and intangible assets represented 37% and 14% of total consolidated assets, respectively. Rental equipment and properties and equipment are long-lived assets which also represented more than 5% of our total consolidated assets as of December 31, 2018. Goodwill and indefinite-lived intangible assets are tested for impairment annually, or more frequently if indicators of impairment exist. Definite-lived intangible assets and long-lived assets are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable. In evaluating the potential for impairment of goodwill, intangible assets and long-lived assets, we make assumptions regarding future operating performance, business trends, competition and

market and general economic conditions. Such analyses further require us to make certain assumptions about our sales, operating margins, growth rates and discount rates. There are inherent uncertainties related to these factors. An impairment charge may result from, among other things, a significant decline in operating results, adverse market conditions, unfavorable changes in applicable laws or regulations, or a variety of other factors. Our total consolidated assets and results of operations for the applicable period could be materially adversely affected if any such charge is recorded.

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We may be unsuccessful in our future acquisitions, if any, which may have an adverse effect on our business.
Our long-term strategy includes exploring acquisitions of companies or businesses to facilitate our growth, enhance our global market position and broaden our product offerings. Such acquisitions may help us expand into adjacent markets, add complementary products and services or allow us to leverage our distribution channels. In connection with this strategy, we could face certain risks and uncertainties in addition to those we face in the day-to-day operations of our business. We also may be unable to identify suitable targets for acquisition or to make acquisitions at favorable prices. If we identify a suitable acquisition candidate, our ability to successfully implement the acquisition would depend on a variety of factors, including our ability to obtain financing on acceptable terms. In addition, our acquisition activities could be disrupted by overtures from competitors for the targeted companies, governmental regulation and rapid developments in our industry that decrease the value of a potential target's products or services.
Acquisitions involve risks, including those associated with the following:

- integrating the operations, financial reporting, disparate systems and processes and personnel of acquired companies;
- managing geographically dispersed operations;
- diverting management's attention from other business concerns;
- changing the competitive landscape, including disrupting existing sales channels or markets;
- entering markets or lines of business in which we have either limited or no direct experience; and
- losing key employees, customers and strategic partners of acquired companies.

We also may not achieve anticipated revenue and cost benefits associated with our acquisitions. Acquisitions may not be accretive to our earnings and may negatively impact our results of operations as a result of, among other things, the incurrence of debt, acquisition costs, impairment of goodwill and amortization of other intangible assets. In addition, future acquisitions could result in dilutive issuances of equity securities.
Businesses acquired by us may have liabilities that are not known to us.
We may assume liabilities in connection with the acquisition of businesses. There may be liabilities that we fail or are unable to discover in the course of performing due diligence investigations on the acquired businesses, or that may be more material than we discovered. In these circumstances, we cannot assure that our rights to indemnification will be sufficient in amount, scope or duration to fully offset the possible liabilities associated with the businesses or property acquired. Further, these liabilities could result in unexpected legal or regulatory exposure, unexpected increases in taxes or other adverse effects on our business. Any such liabilities, individually or in the aggregate, could have a material adverse effect on our financial condition, results of operations or cash flow.
Item 1B. Unresolved Staff Comments.
None.
Item 2. Properties.
As of December 31, 2018, the Company utilized ten principal manufacturing plants located throughout the U.S., as well as two in Europe, one in Canada and one in South Africa. The Company also leases facilities within the U.S., Europe and Canada from which we provide sales, service and/or equipment rentals. As of December 31, 2018, the Company devoted approximately 1.6 million square feet to manufacturing and 0.8 million square feet to sales, service, warehousing and office space. Of the total square footage, approximately 78% is devoted to the Environmental Solutions Group and 22% to the Safety and Security Systems Group. Approximately 42% of the total square footage is owned by the Company with the remaining 58% being leased. Owned facilities are subject to lien under the Company's Amended and Restated Credit Agreement dated January 27, 2016 (as amended on June 2, 2017, the "Amended 2016 Credit Agreement").
The Company believes its properties, and related machinery and equipment, are well-maintained, suitable and adequate for their intended purposes. In the aggregate, these facilities are of sufficient capacity for the Company's current business needs. However, the Company may make additional investments in certain facilities in the future in response to increased demand for the Company's products.
Item 3. Legal Proceedings.

The information concerning the Company's legal proceedings included in Note 12 – Legal Proceedings to the accompanying consolidated financial statements is incorporated herein by reference.

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Item 4. Mine Safety Disclosures.

Not applicable.

PART II

Item 5. Market for Registrant’s Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

Market Information

The Company’s common stock is listed and traded on the New York Stock Exchange (“NYSE”) under the symbol “FSS”.

Holders

As of January 31, 2019, there were 1,571 holders of record of the Company’s common stock.

Securities Authorized for Issuance under Equity Compensation

Information concerning the Company’s equity compensation plans is included under Item 12 of Part III of this Form 10-K.

Recent Sales of Unregistered Securities

There were no sales of unregistered securities by the Company during the year ended December 31, 2018.

Purchases of Equity Securities

The following table provides a summary of the Company’s repurchase activity for its common stock during the three months ended December 31, 2018:

Period	Total Number of Shares Purchased	Average Price Paid Per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Maximum Dollar Value of Shares That May Yet Be Purchased Under the Plans or Programs [(a)]
October 2018 (9/30/18 - 11/3/18)	—	$ —	—	$31,395,802
November 2018 (11/4/18 - 12/1/18)	—	—	—	31,395,802
December 2018 (12/2/18 - 12/31/18)	62,500	19.7920	62,500	30,158,802

(a) On November 4, 2014, the Board authorized a stock repurchase program of up to $75.0 million of the Company’s common stock.

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Performance Graph

The following graph compares the cumulative five-year total return to stockholders of the Company's common stock relative to the cumulative total returns of the Russell 2000 index, the S&P Midcap 400 index and the S&P Industrials index. The graph assumes that the value of the investment in the Company's common stock, and in each index, was $100 on December 31, 2013 and assumes reinvestment of all dividends through December 31, 2018.

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	As of December 31,					
	2013	2014	2015	2016	2017	2018
Federal Signal Corporation	$100.00	$106.04	$110.64	$111.22	$145.48	$146.03
Russell 2000	100.00	104.89	100.26	121.63	139.44	124.09
S&P Midcap 400	100.00	109.77	107.38	129.65	150.71	134.01
S&P Industrials	100.00	109.83	107.04	127.23	153.99	133.53

The stock price performance included in this graph is not necessarily indicative of future stock price performance. Notwithstanding anything set forth in any of our previous filings under the Securities Act or the Exchange Act, which might be incorporated into future filings in whole or part, including this Form 10-K, the preceding performance graph shall not be deemed incorporated by reference into any such filings.

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Item 6. Selected Financial Data.

The following table summarizes selected financial information of the Company as of, and for each of the five years in the period ended, December 31, 2018:

	For the Years Ended December 31,				
($ in millions, except per share data)	2018	2017	2016	2015	2014
Results of Operations:					
Net sales	$1,089.5	$898.5	$707.9	$768.0	$779.1
Operating income (a) (b) (c) (d)	121.5	73.6	60.8	107.4	92.0
Income from continuing operations (a) (b) (c) (d) (e)	93.7	60.5	39.4	65.8	59.7
Gain (loss) from discontinued operations and disposal, net of tax	0.3	1.1	4.4	(2.3)	4.0
Net income (a) (b) (c) (d) (e)	$94.0	$61.6	$43.8	$63.5	$63.7
Financial Position:					
Capital expenditures	$14.1	$8.0	$6.1	$9.6	$13.7
Depreciation and amortization	36.4	30.0	19.1	12.3	11.5
Total assets	1,023.8	992.3	643.2	666.5	658.7
Total debt (f)	210.1	277.7	64.0	44.1	50.2
Common Stock Data:					
Diluted earnings per share — continuing operations	$1.53	$1.00	$0.64	$1.04	$0.94
Cash dividends per common share	0.31	0.28	0.28	0.25	0.09
Weighted average shares outstanding — diluted (in millions)	61.2	60.4	61.2	63.4	63.6
Performance Measures:					
Operating margin	11.2 %	8.2 %	8.6 %	14.0 %	11.8 %
Adjusted EBITDA (g)	$160.5	$113.5	$86.6	$120.1	$103.5
Adjusted EBITDA margin (g)	14.7 %	12.6 %	12.2 %	15.6 %	13.3 %
Other Data:					
Total orders	$1,173.2	$1,018.0	$674.4	$686.1	$807.4
Backlog	337.7	257.5	137.0	171.3	254.7

(a) 2018 operating income includes acquisition and integration-related expenses of $1.5 million. 2018 income from continuing operations includes the after-tax effects of the acquisition and integration-related expenses, as well as an $8.6 million net benefit associated with tax planning strategies.

(b) 2017 operating income includes acquisition and integration-related expenses and restructuring charges of $2.7 million and $0.6 million, respectively. 2017 income from continuing operations includes the after-tax effects of the acquisition and integration-related expenses, restructuring charges and pension settlement charges of $6.1 million, as well as a $20.2 million net benefit from special tax items, primarily represented by the Company's preliminary estimate of the impact of the 2017 Tax Act, including the effect of the reduction in the corporate tax rate in the U.S.

(c) 2016 operating income includes acquisition and integration-related expenses and restructuring charges of $1.4 million and $1.7 million, respectively. 2016 income from continuing operations includes the after-tax effects of the acquisition and integration-related expenses and restructuring charges and also $0.3 million of debt settlement charges, and a $2.2 million net benefit resulting from changes in deferred tax valuation allowances in Canada and the U.K.

(d) 2015 operating income includes restructuring charges of $0.4 million. 2015 income from continuing operations includes the after-tax effects of the restructuring charges, as well as a $1.4 million net benefit from special tax items, comprised of a $4.2 million net tax benefit associated with tax planning strategies, offset by a $2.4 million adjustment of deferred tax assets and $0.4 million of expense associated with a change in the enacted tax rate in the U.K.

(e) 2014 income from continuing operations includes the effects of a $3.5 million release of valuation allowance that was previously recorded against the Company's foreign deferred tax assets.

(f) Includes short-term borrowings, the current portion of long-term borrowings and capital lease obligations of $0.2 million, $0.3 million, $0.5 million, $0.4 million and $6.2 million, respectively.

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(g) The Company uses adjusted EBITDA and the ratio of adjusted EBITDA to net sales (“adjusted EBITDA margin”) as additional measures which are representative of its underlying performance and to improve the comparability of results across reporting periods. We believe that investors use versions of these metrics in a similar manner. For these reasons, the Company believes that adjusted EBITDA and adjusted EBITDA margin are meaningful metrics to investors in evaluating the Company’s underlying financial performance. Consolidated adjusted EBITDA is a non-GAAP measure that represents the total of income from continuing operations, interest expense, pension settlement charges, hearing loss settlement charges, debt settlement charges, acquisition and integration-related expenses, restructuring activity, executive severance costs, purchase accounting effects, other income/expense, income tax expense, and depreciation and amortization expense. Consolidated adjusted EBITDA margin is a non-GAAP measure that represents the total of income from continuing operations, interest expense, pension settlement charges, hearing loss settlement charges, debt settlement charges, acquisition and integration-related expenses, restructuring activity, executive severance costs, purchase accounting effects, other income/expense, income tax expense, and depreciation and amortization expense divided by net sales for the applicable period(s). Other companies may use different methods to calculate adjusted EBITDA and adjusted EBITDA margin. The following table summarizes the Company’s consolidated adjusted EBITDA and adjusted EBITDA margin and reconciles income from continuing operations to consolidated adjusted EBITDA for each of the five years in the period ended December 31, 2018:

	For the Years Ended December 31,				
($ in millions)	2018	2017	2016	2015	2014
Income from continuing operations	$93.7	$60.5	$39.4	$65.8	$59.7
Add:					
Interest expense	9.3	7.3	1.9	2.3	3.6
Pension settlement charges	—	6.1	—	—	—
Hearing loss settlement charges	0.4	1.5	—	—	—
Debt settlement charges	—	—	0.3	—	—
Acquisition and integration-related expenses	1.5	2.7	1.4	—	—
Restructuring	—	0.6	1.7	0.4	—
Executive severance costs	—	0.7	—	—	—
Purchase accounting effects *	0.7	4.4	3.6	—	—
Other expense (income), net	0.6	(0.8)	1.8	5.2	5.0
Income tax expense	17.9	0.5	17.4	34.1	23.7
Depreciation and amortization	36.4	30.0	19.1	12.3	11.5
Adjusted EBITDA	$160.5	$113.5	$86.6	$120.1	$103.5
Net sales	$1,089.5	$898.5	$707.9	$768.0	$779.1
Adjusted EBITDA margin	14.7 %	12.6 %	12.2 %	15.6 %	13.3 %

*Purchase accounting effects represent the step-up in the valuation of equipment acquired in recent business combinations that was sold during the periods presented within.

The selected financial data set forth above should be read in conjunction with the Company’s consolidated financial statements, including the notes thereto, and management’s discussion and analysis of financial condition and results of operations, included under Item 8 of Part II of this Form 10-K and Item 7 of Part II of this Form 10-K, respectively.

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

Management's Discussion and Analysis of Financial Condition and Results of Operations ("MD&A") is designed to provide information that is supplemental to, and shall be read together with, the consolidated financial statements and the accompanying notes contained in this Form 10-K. Information in MD&A is intended to assist the reader in obtaining an understanding of (i) the consolidated financial statements, (ii) the Company's business segments and how the results of those segments impact the Company's results of operations and financial condition as a whole and (iii) how certain accounting principles affect the Company's consolidated financial statements.

Executive Summary

The Company is a leading global manufacturer and supplier of (i) vehicles and equipment for maintenance and infrastructure end-markets, including sewer cleaners, vacuum trucks, street sweepers, dump truck bodies and trailers and (ii) safety, security and communication equipment, such as lights, sirens and warning systems. In addition, we sell parts and provide service, repair, equipment rentals and training as part of a comprehensive aftermarket offering to our customer base. We operate 14 manufacturing facilities in five countries and provide products and integrated solutions to municipal, governmental, industrial and commercial customers in all regions of the world.

As described in Note 16 – Segment Information to the accompanying consolidated financial statements, the Company's business units are organized in two reportable segments: the Environmental Solutions Group and the Safety and Security Systems Group.

During 2018, the Company continued to focus on executing against its key long-term objectives, including the following:

- Creating disciplined growth;
- Improving manufacturing efficiencies and costs;
- Leveraging invested capital; and
- Diversifying our customer base.

Highlights of the Company's achievement against these objectives in 2018 include the following:

- With the traction on our organic growth initiatives, and benefits from the 2017 acquisition of TBEI, we accelerated the achievement of our goal of profitably growing our revenues in excess of $1 billion by 2020. Our net sales for the year ended December 31, 2018 increased to $1,089.5 million.
- We generated $93.7 million of Income from continuing operations during the year ended December 31, 2018, an increase of $33.2 million, or 55%, compared with $60.5 million in 2017.
- On a consolidated basis, our adjusted EBITDA* increased by $47.0 million, or 41%, and our adjusted EBITDA margin* for 2018 was 14.7%, up from 12.6% in 2017.
- Both of our groups reported significant improvement in net sales and earnings, delivering adjusted EBITDA margins* towards the high end of our target ranges.
- We have continued to focus on new product development and are encouraged that these efforts will provide additional opportunities to further diversify our customer base. In particular, we are pleased with the market reaction to our new hydro-excavator vehicle designed for utility markets.
- Our eighty-twenty improvement ("ETI") initiatives remain a critical part of our culture and we continue to focus on reducing product costs and improving manufacturing efficiencies across all our businesses.
- With $92.8 million of cash being generated from continuing operations during 2018, we have been able to pay down $62.1 million of debt in 2018, bringing our total debt repayment since the completion of the TBEI acquisition in June 2017 to approximately $96.0 million.
- During the year, we demonstrated our commitment to returning value to stockholders by paying increased cash dividends of $18.7 million in 2018, up from $16.8 million in 2017.
- We also spent $1.2 million repurchasing shares under our authorized repurchase program. At the end of 2018, we had $30.2 million of authorization remaining under our existing share repurchase program, which represents approximately 2% of our market capitalization.

- With our strong balance sheet and positive operating cash flow, we are well positioned to continue to invest in internal growth initiatives, pursue strategic acquisitions and consider ways to return value to stockholders.

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Our consolidated financial results in 2018 reflected year-over-year improvement in many areas, driven by both organic growth and benefits from our recent acquisitions:

- Net sales for the year ended December 31, 2018 increased by $191.0 million, or 21%, to $1,089.5 million, with organic sales growth of approximately 12%.
- Operating income for the year ended December 31, 2018 increased by $47.9 million, or 65%, to $121.5 million.
- Adjusted EBITDA* for the year ended December 31, 2018 was $160.5 million, up $47.0 million, or 41%, and our adjusted EBITDA margin* for the year ended December 31, 2018 was 14.7%, up from 12.6% in 2017.
- Income from continuing operations for the year ended December 31, 2018 was $93.7 million, up $33.2 million, or 55%, from $60.5 million in the prior year. This equated to diluted earnings per share of $1.53, up 53% from $1.00 per share last year.
- Cash flow from continuing operating activities for the year ended December 31, 2018 was $92.8 million, an increase of $19.3 million, or 26%.
- Total orders for the year ended December 31, 2018 were $1,173.2 million, an increase of $155.2 million, or 15%.
- Our consolidated backlog at December 31, 2018 was $337.7 million, up $80.2 million, or 31%, from $257.5 million at December 31, 2017.

* The Company uses adjusted EBITDA and adjusted EBITDA margin as additional measures which are representative of its underlying performance and to improve the comparability of results across reporting periods. Refer to Item 6. Selected Financial Data for further discussion regarding these non-GAAP metrics and a reconciliation of each to the most comparable GAAP measure for each of the periods presented.

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Results of Operations

The following table summarizes our Consolidated Statements of Operations and illustrates the key financial indicators used to assess our consolidated financial results:

	For the Years Ended December 31,			Change	
($ in millions, except per share data)	2018	2017	2016	2018 vs. 2017	2017 vs. 2016
Net sales	$1,089.5	$898.5	$707.9	$191.0	$190.6
Cost of sales	807.4	677.3	524.5	130.1	152.8
Gross profit	282.1	221.2	183.4	60.9	37.8
Selling, engineering, general and administrative expenses	159.1	144.3	119.5	14.8	24.8
Acquisition and integration-related expenses	1.5	2.7	1.4	(1.2)	1.3
Restructuring	—	0.6	1.7	(0.6)	(1.1)
Operating income	121.5	73.6	60.8	47.9	12.8
Interest expense	9.3	7.3	1.9	2.0	5.4
Debt settlement charges	—	—	0.3	—	(0.3)
Pension settlement charges	—	6.1	—	(6.1)	6.1
Other expense (income), net	0.6	(0.8)	1.8	1.4	(2.6)
Income before income taxes	111.6	61.0	56.8	50.6	4.2
Income tax expense	17.9	0.5	17.4	17.4	(16.9)
Income from continuing operations	93.7	60.5	39.4	33.2	21.1
Gain from discontinued operations and disposal, net of tax	0.3	1.1	4.4	(0.8)	(3.3)
Net income	$94.0	$61.6	$43.8	$32.4	$17.8
Other data:					
Operating margin	11.2%	8.2%	8.6%	3.0%	(0.4)%
Adjusted EBITDA [(a)]	$160.5	$113.5	$86.6	$47.0	$26.9
Adjusted EBITDA margin [(a)]	14.7%	12.6%	12.2%	2.1%	0.4%
Diluted earnings per share — Continuing operations	$1.53	$1.00	$0.64	$0.53	$0.36
Total orders	1,173.2	1,018.0	674.4	155.2	343.6
Backlog	337.7	257.5	137.0	80.2	120.5
Depreciation & amortization	36.4	30.0	19.1	6.4	10.9

(a) The Company uses adjusted EBITDA and adjusted EBITDA margin as additional measures which are representative of its underlying performance and to improve the comparability of results across reporting periods. Refer to Item 6. Selected Financial Data for further discussion regarding these non-GAAP metrics and a reconciliation of each to the most comparable GAAP measure for each of the periods presented.

Year ended December 31, 2018 vs. year ended December 31, 2017

Net sales

Net sales increased by $191.0 million, or 21%, for the year ended December 31, 2018, compared to the prior year. Within the Environmental Solutions Group, net sales increased by $170.9 million, or 25%, largely due to $98.1 million of incremental net sales resulting from the prior-year TBEI acquisition and organic sales growth of $72.8 million, or 12%. The organic growth was primarily due to improved shipments of vacuum trucks and sewer cleaners, in addition to higher aftermarket revenues, represented by increases in rental income, parts and services revenues and sales of used equipment. These improvements included benefits from pricing actions and were partially offset by lower sales of products manufactured by other companies, such as refuse trucks. In the Safety and Security Systems Group, net sales increased by $20.1 million, or 10%, primarily due to higher sales into global public safety markets and improved international sales of outdoor warning systems.

Cost of sales

For the year ended December 31, 2018, cost of sales increased by $130.1 million, or 19%, compared to the prior year, largely due to an increase of $117.1 million, or 21%, within the Environmental Solutions Group, primarily driven by increased sales volumes, the effects of a full-year of TBEI activity in the current-year period compared with seven months in the prior year, higher material costs and a $3.7 million increase in depreciation expense, partially offset by a $3.7 million reduction in

purchase accounting expenses. Within the Safety and Security Systems Group, cost of sales increased by $13.0 million, or 10%, largely driven by higher sales volumes and unfavorable foreign currency translation effects.

Gross profit

For the year ended December 31, 2018, gross profit increased by $60.9 million, or 28%, compared to the prior year, primarily due to improvements of $53.8 million and $7.1 million within the Environmental Solutions Group and the Safety and Security Systems Group, respectively. Gross margin for the year ended December 31, 2018 was 25.9%, compared to 24.6% in the prior year, primarily driven by a 210 basis point gross margin improvement within the Environmental Solutions Group, associated with improved operating leverage, benefits from actions taken in response to higher commodity costs, favorable sales mix and the reduction in purchase accounting expenses, described above, partially offset by the higher depreciation expense.

Selling, engineering, general and administrative expenses

For the year ended December 31, 2018, SEG&A expenses increased by $14.8 million, or 10%, primarily represented by a $13.2 million increase within the Environmental Solutions Group, largely the result of the addition of expenses of associated with the TBEI acquisition, including an increase in amortization expense of $3.2 million. SEG&A expenses within the Safety and Security Systems Group increased by $0.6 million, primarily due to higher expenses associated with new product development and other growth initiatives, while corporate SEG&A expenses increased by $1.0 million. As a percentage of net sales, SEG&A expenses decreased from 16.1% in the prior year, to 14.6% in the current year.

Operating income

Operating income for the year ended December 31, 2018 increased by $47.9 million, or 65%, to $121.5 million, compared to the prior year. Within our Environmental Solutions Group, operating income for the year ended December 31, 2018 increased by $40.6 million, or 56%, with higher sales volumes, improved operating leverage and an incremental operating income contribution of $9.5 million from TBEI, associated with including a full-year of activity in 2018, compared to only seven months in the prior year. TBEI's operating income contribution in 2018 included the effects of amortization expense on intangible assets acquired, which contributed to an increase in depreciation and amortization expense of $6.9 million. Within our Safety and Security Systems Group, operating income for the year ended December 31, 2018 increased by $7.1 million, or 26%, while corporate expenses decreased by $0.2 million, primarily driven by a $1.2 million decrease in acquisition and integration-related expenses, reductions in hearing loss litigation and post-employment expenses and the absence of $0.7 million in executive severance costs, partially offset by higher employee incentive and stock compensation costs. Consolidated operating margin for the year ended December 31, 2018 was 11.2%, compared to 8.2% in the prior year.

Interest expense

Interest expense for the year ended December 31, 2018 increased by $2.0 million, or 27%, compared to the prior year, largely due to higher average debt levels following the acquisition of TBEI in June 2017. For further discussion, see Note 8 – Debt to the accompanying consolidated financial statements.

Other expense (income), net

For the year ended December 31, 2018, Other expense (income), net, totaled $0.6 million of expense, largely due to foreign currency transaction losses and $0.4 million of net periodic pension expense. For the year ended December 31, 2017, $0.8 million of income was reported, largely due to foreign currency transaction gains, which were partially offset by $0.4 million of net periodic pension expense.

Income tax expense

The Company recognized income tax expense of $17.9 million for the year ended December 31, 2018, compared to $0.5 million for the year ended December 31, 2017. The increase in income tax expense was primarily due to higher earnings, and the impact of certain special tax items in the prior year, which did not repeat in 2018. In addition, during the year ended December 31, 2018, the Company recognized a tax benefit of $8.6 million associated with the completion of a tax planning strategy in Spain, which is expected to reduce cash tax payments in that jurisdiction over the next several years. Tax expense for the year ended December 31, 2017 was lower than in 2018, largely due to the

recognition of a $23.0 million net tax benefit associated with the revaluation of the Company's net deferred tax liabilities in the U.S. following the reduction of the federal corporate tax rate included in the 2017 Tax Act. This benefit was partially offset by a $2.2 million net increase in valuation allowance, inclusive of a $3.0 million valuation allowance recorded against the Company's foreign tax credits as a result of the enactment of the 2017 Tax Act, the recognition of $0.6 million of additional tax expense associated with a change in the state tax rate in Illinois, and additional taxes resulting from higher pre-tax earnings. The Company's effective tax rate for the year

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ended December 31, 2018 was 16.0%, compared to 0.8% in 2017. The 2018 effective tax rate included the effects of the benefit from the tax planning strategy, whereas the 2017 effective tax rate included the aforementioned impacts resulting from the 2017 Tax Act. For further discussion, see Note 9 – Income Taxes to the accompanying consolidated financial statements.

Income from continuing operations

Income from continuing operations was $93.7 million for the year ended December 31, 2018, compared with $60.5 million in the prior year, largely due to the improved operating income and the absence of $6.1 million in pension settlement charges incurred in the prior year, partially offset by the $17.4 million increase in income tax expense, the $2.0 million increase in interest expense and the $1.4 million reduction in other income.

Gain from discontinued operations and disposal, net of tax

In the year ended December 31, 2018, the Company recorded a net gain from discontinued operations and disposal of $0.3 million, primarily due to adjustments of estimated product liability obligations of previously discontinued businesses, resulting from updated actuarial valuations.

In the year ended December 31, 2017, the Company recorded a net gain from discontinued operations and disposal of $1.1 million, primarily due to an adjustment of foreign tax credits associated with the sale of the Fire Rescue Group and adjustments of estimated product liability obligations of previously discontinued businesses, resulting from updated actuarial valuations.

For further discussion of the gain from discontinued operations and disposals, see Note 18 – Discontinued Operations to the accompanying consolidated financial statements.

Year ended December 31, 2017 vs. year ended December 31, 2016

Net sales

Net sales increased by $190.6 million, or 27%, for the year ended December 31, 2017, compared to the prior year. Within the Environmental Solutions Group, net sales increased by $201.9 million, or 41%, largely due to the addition of $109.4 million of net sales from the TBEI acquisition, approximately $54.7 million of incremental net sales resulting from the JJE acquisition, including increases in rental income and sales of used equipment, and improved domestic sales of sewer cleaners and vacuum trucks. In the Safety and Security Systems Group, net sales decreased by $11.3 million, or 5%, primarily due to lower sales into global public safety markets and decreased sales of outdoor warning systems.

Cost of sales

For the year ended December 31, 2017, cost of sales increased by $152.8 million, or 29%, compared to the prior year, largely due to an increase of $162.4 million, or 42%, within the Environmental Solutions Group, primarily driven by increased sales volumes, additional cost of sales from the TBEI acquisition and the effects of a full year of JJE activity in 2017 compared with seven months in 2016, recognition of approximately $0.8 million more expense associated with purchase accounting effects and a $6.5 million increase in depreciation expense, largely resulting from depreciation on rental equipment acquired in the JJE transaction. This increase was partially offset by a decrease in cost of sales of $9.6 million, or 7%, within the Safety and Security Systems Group, largely driven by lower sales volumes and the impact of material and labor cost reduction initiatives.

Gross profit

For the year ended December 31, 2017, gross profit increased by $37.8 million, or 21%, compared to the prior year, primarily due to a $39.5 million improvement in the Environmental Solutions Group, partially offset by a $1.7 million reduction within the Safety and Security Systems Group. Gross margin for the year ended December 31, 2017 was 24.6%, compared to 25.9% in the prior year, largely due to incremental depreciation expense and purchase accounting expense effects, partially offset by gross margin improvement within the Safety and Security Systems Group related to the savings associated with material and labor cost reduction initiatives.

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Selling, engineering, general and administrative expenses

For the year ended December 31, 2017, SEG&A expenses increased by $24.8 million, or 21%, primarily represented by a $21.1 million increase within the Environmental Solutions Group, largely the result of the addition of expenses of businesses acquired, a $4.7 million increase in amortization expense and strategic investments in our sales force to support our organic growth initiatives. SEG&A expenses with the Safety and Security Systems Group increased by $0.3 million in comparison to the prior year, while Corporate SEG&A expenses increased by $3.4 million, primarily driven by the recognition of $0.7 million in executive severance costs, increased legal expenses associated with hearing loss litigation and higher employee incentive compensation costs.

Operating income

Operating income for the year ended December 31, 2017 increased by $12.8 million, or 21%, to $73.6 million, primarily driven by a $17.9 million operating income improvement within the Environmental Solutions Group, associated with increased sales volumes, a $6.2 million operating income contribution from TBEI and the effects of including a full year of operating income from JJE in 2017, compared to only seven months in 2016. TBEI's operating income contribution in 2017 included the effects of amortization expense on intangible assets acquired, which, coupled with the increased JJE activity, contributed to an increase in the Environmental Solutions Group's depreciation and amortization expense of $11.2 million. In addition, there was a $0.8 million increase in purchase accounting expense effects and a $0.5 million increase in acquisition-related costs in 2017. Within the Safety and Security Systems Group, operating income in the year ended December 31, 2017 decreased by $0.9 million, with the $1.7 million decrease in gross profit and $0.3 million increase in SEG&A expenses being partially offset by a $1.1 million reduction in restructuring charges. In addition to the $3.4 million increase in SEG&A expenses, corporate expenses in the year ended December 31, 2017 also included a $0.8 million increase in acquisition-related expenses. Consolidated operating margin for the year ended December 31, 2017, inclusive of the incremental depreciation and amortization, purchase accounting expense effects, hearing loss settlement charges and acquisition costs, was 8.2%, compared to 8.6% in the prior year.

Interest expense

Interest expense for the year ended December 31, 2017 increased by $5.4 million compared to the prior year, largely due to higher average debt levels following the acquisition of TBEI.

Pension settlement charges

During the year ended December 31, 2017, the Company announced a limited-time voluntary lump-sum pension offering to eligible, terminated, vested participants of its U.S. defined benefit plan, paying a total of $13.7 million in lump-sum benefit payments to individuals that elected to receive a lump-sum settlement payment, using assets of the plan. As total benefit payments during the year ended December 31, 2017 exceeded the sum of the service and interest cost, the Company was required to measure the liabilities of the benefit plans and recognize a pension settlement charge of $6.1 million. For further discussion, see Note 10 – Pensions to the accompanying consolidated financial statements.

Other (income) expense, net

For the year ended December 31, 2017, Other (income) expense, net, totaled $0.8 million of income, largely due to foreign currency transaction gains, partially offset by $0.4 million of net periodic pension expense. For the year ended December 31, 2016, $1.8 million of expense was reported, largely related to $3.1 million of net periodic pension expense, partially offset by a gain on the settlement of a foreign currency forward contract and interest income on a loan provided to a customer.

Income tax expense

The Company recognized income tax expense of $0.5 million for the year ended December 31, 2017, compared to $17.4 million for the year ended December 31, 2016. The decrease in expense was primarily due to the recognition of a $23.0 million net tax benefit associated with the revaluation of the Company's net deferred tax liabilities in the U.S. following the reduction of the federal corporate tax rate included in the 2017 Tax Act, partially offset by a $2.2 million net increase in valuation allowance, inclusive of a $3.0 million valuation allowance recorded against the

Company's foreign tax credits as a result of the enactment of the 2017 Tax Act, the recognition of $0.6 million of additional tax expense associated with a change in the state tax rate in Illinois, and additional taxes resulting from higher pre-tax earnings. The Company's effective tax rate for the year ended December 31, 2017 was 0.8%, compared to 30.6% in 2016. The 2017 effective tax rate included the aforementioned impacts resulting from the 2017 Tax Act. The effective tax rate for 2016 included a $2.2 million net benefit from Canadian and U.K. valuation allowance changes.

Income from continuing operations

Income from continuing operations was $60.5 million for the year ended December 31, 2017, compared with $39.4 million in the prior year, largely due to the improved operating income, the $16.9 million reduction in income tax expense, the $2.6 million increase in other income and the absence of $0.3 million in debt settlement charges, partially offset by the $5.4 million increase in interest expense, associated with higher average debt levels following the acquisition of TBEI and the $6.1 million pension settlement charge.

Gain from discontinued operations and disposal, net of tax

For the year ended December 31, 2017, the Company recorded a net gain from discontinued operations and disposal of $1.1 million, primarily due to an adjustment of foreign tax credits associated with the sale of the Fire Rescue Group and adjustments of estimated product liability obligations of previously discontinued businesses, resulting from updated actuarial valuations.

For the year ended December 31, 2016, the Company recorded a net gain from discontinued operations and disposal of $4.4 million, primarily driven by the $4.2 million net gain on disposal of the Fire Rescue Group, which was discontinued in 2015, partially offset by the $0.6 million net loss that the Fire Rescue Group realized in its 2016 operations up to the January 29, 2016 sale completion date. The net gain on disposal includes a $1.3 million charge to recognize a liability in connection with a Latvian commercial dispute. Also contributing to the net gain in 2016 was a reduction in uncertain tax position reserves of approximately $1.0 million, as well as adjustments of estimated product liability obligations of previously discontinued businesses, resulting from updated actuarial valuations.

Orders & Backlog

($ in millions)	2018	2017	2016
Total orders	$1,173.2	$1,018.0	$674.4
Change in orders year-over-year	15.2 %	50.9 %	(1.7)%
Change in U.S. municipal and government orders year-over-year	3.5 %	18.3 %	(5.8)%
Change in U.S. industrial and commercial orders year-over-year	28.5 %	139.6 %	0.3 %
Change in non-U.S. orders year-over-year	8.4 %	21.2 %	3.5 %
Backlog	$337.7	$257.5	$137.0
Change in backlog year-over-year	31.1 %	88.0 %	(20.0)%

On the date of acquisition, JJE had a backlog of orders from its end customers of $43.3 million. These acquired orders were included in total orders reported for the year ended December 31, 2016.

On the date of acquisition, TBEI had a backlog of orders from its end customers of $44.8 million. These acquired orders were included in total orders reported for the year ended December 31, 2017.

Year ended December 31, 2018 vs. year ended December 31, 2017

Total orders for the year ended December 31, 2018 were $1,173.2 million, an increase of $155.2 million, or 15%, compared to the prior year. The Environmental Solutions Group reported total orders of $945.8 million in 2018, an increase of $139.5 million, or 17%, compared to the prior year. The improvement was driven by incremental orders of $66.2 million related to the inclusion of TBEI orders for a full year in 2018 versus seven months in 2017, and organic order growth of approximately $73.3 million, or 11%. The organic growth was largely the result of improved orders for vacuum trucks, sewer cleaners, street sweepers and waterblasting equipment, as well as higher aftermarket demand, representing increased orders for parts, service, used and rental equipment. These improvements were partially offset by a reduction in refuse truck orders. Within the Safety and Security Systems Group, orders increased by $15.7 million compared to the prior year, primarily driven by a $14.9 million improvement in global orders for public safety products.

U.S. municipal and governmental orders increased by $12.2 million, or 3%, primarily due to a $14.8 million improvement within the Environmental Solutions Group, primarily driven by a $13.1 million improvement in orders for sewer cleaners and higher aftermarket demand. This improvement was partially offset by a $2.6 million reduction in municipal orders within the Safety and Security Systems Group, driven by a decrease in orders for outdoor warning systems of $6.8 million, partially offset by an increase in orders for public safety products of $4.2 million.

U.S. industrial and commercial orders increased by $123.5 million, or 29%, largely driven by a $116.9 million increase within the Environmental Solutions Group, primarily related to a $48.3 million improvement in orders for vacuum trucks and an incremental $67.0 million of orders from a full year of TBEI activity in 2018. In addition, aftermarket orders increased by $4.8

million. These increases were partially offset by a $3.5 million reduction in street sweeper orders. Within the Safety and Security Systems Group, industrial orders increased by $6.6 million due to increases in orders for outdoor warning systems, industrial products and public safety products of $3.8 million, $1.6 million and $1.2 million, respectively.

Non-U.S. orders increased by $19.5 million, or 8%, largely due to a $7.8 million increase within the Environmental Solutions Group, primarily due to improvements in orders for vacuum trucks, sewer cleaners, street sweepers, and waterblasting equipment of $11.3 million, $6.8 million, $4.4 million and $2.1 million, respectively. In addition, aftermarket orders improved by $7.3 million. Partially offsetting these improvements was a $23.0 million decrease in refuse truck orders. Orders within the Safety and Security Systems Group increased by $11.7 million, largely due to a $9.5 million increase in orders for public safety products.

Year ended December 31, 2017 vs. year ended December 31, 2016

Total orders for the year ended December 31, 2017 were $1,018.0 million, an increase of $343.6 million, or 51%, compared to the prior year. The Environmental Solutions Group reported total orders of $806.3 million in 2017, an increase of $331.5 million, or 70%, compared to the prior year. The improvement was driven by organic order growth of approximately $121.1 million, or 33%, primarily represented by improved orders for sewer cleaners, street sweepers and vacuum trucks, the effects of the TBEI acquisition, which added $151.9 million in orders, and a net increase in orders of $58.5 million related to the inclusion of JJE orders for a full year in 2017 versus seven months in 2016. Within the Safety and Security Systems Group, orders increased by $12.1 million compared to the prior year, primarily driven by improvements in orders of industrial products, public safety products and outdoor warning systems.

U.S. municipal and governmental orders increased by $55.8 million, or 18%, primarily due to a $56.0 million improvement within the Environmental Solutions Group, largely represented by increases in orders for street sweepers and sewer cleaners of $24.0 million and $20.4 million, respectively, and a $13.9 million increase in orders for dump truck bodies following the acquisition of TBEI. This improvement was partially offset by a $0.2 million reduction in municipal orders within the Safety and Security Systems Group.

U.S. industrial and commercial orders increased by $247.0 million, or 140%, largely driven by a $239.9 million increase within the Environmental Solutions Group, primarily related to improvements in orders for vacuum trucks and sewer cleaners of $50.4 million and $29.2 million, respectively, the acquisition of TBEI, which contributed $138.0 million, and the effects of the inclusion of JJE orders for a full year in 2017 versus seven months in 2016. Within the Safety and Security Systems Group, industrial orders were up $7.1 million, due to increased orders of outdoor warning systems, public safety products and industrial products of $4.0 million, $2.5 million and $0.6 million, respectively.

Non-U.S. orders increased by $40.8 million, or 21%, largely due to a $35.6 million increase within the Environmental Solutions Group, reflecting increased Canadian orders following the acquisition of JJE in June of 2016. Orders within the Safety and Security Systems Group increased by $5.2 million, driven by improved orders in industrial and coal markets, partially offset by reduced orders from international public safety markets.

Backlog

Backlog was $337.7 million at December 31, 2018 as compared to $257.5 million at December 31, 2017. The increase of $80.2 million, or 31%, was primarily due to a $79.2 million increase in backlog within the Environmental Solutions Group, largely due to higher demand for vacuum trucks, sewer cleaners and street sweepers in the U.S. In addition, backlog within the Safety and Security Systems Group improved by $1.0 million, primarily due to increased orders for public safety products.

Environmental Solutions

The following table summarizes the Environmental Solutions Group's operating results as of and for the years ended December 31, 2018, 2017 and 2016:

	For the Years Ended December 31,			Change	
($ in millions)	2018	2017	2016	2018 vs. 2017	2017 vs. 2016
Net sales	$863.5	$692.6	$490.7	$170.9	$201.9
Operating income	113.0	72.4	54.5	40.6	17.9
Other data:					
Operating margin	13.1 %	10.5 %	11.1 %	2.6 %	(0.6)%
Total orders	$945.8	$806.3	$474.8	$139.5	$331.5
Backlog	310.3	231.1	116.6	79.2	114.5
Depreciation and amortization	32.6	25.7	14.5	6.9	11.2

Year ended December 31, 2018 vs. year ended December 31, 2017

Total orders increased by $139.5 million, or 17%, for the year ended December 31, 2018. U.S. orders increased by $131.7 million, largely due to the prior year acquisition of TBEI, which contributed an increase in orders of $64.4 million in a full-year in 2018. The organic growth in the U.S. of $67.3 million was largely driven by improvements in orders for vacuum trucks and sewer cleaners of $49.6 million and $12.4 million, respectively. In addition, aftermarket demand, representing orders for parts, service, used and rental equipment, improved by $9.3 million. Non-U.S. orders increased by $7.8 million, primarily due to improvements in orders for vacuum trucks, sewer cleaners, street sweepers, and waterblasting equipment of $11.3 million, $6.8 million, $4.4 million and $2.1 million, respectively. In addition, aftermarket orders improved by $7.3 million. Partially offsetting these improvements was a $23.0 million decrease in refuse truck orders.

Net sales increased by $170.9 million, or 25%, for the year ended December 31, 2018. U.S. sales increased by $167.4 million, or 31%, primarily due to the inclusion of five more months of TBEI results in the current year, accounting for $97.0 million of the sales increase, as well as increases in shipments of vacuum trucks and sewer cleaners of $37.9 million and $28.8 million, respectively. In addition, aftermarket revenues improved by $3.4 million, primarily represented by increased parts and service revenues and rental income. Non-U.S. sales increased by $3.5 million, or 2%, primarily due to a $12.4 million improvement in aftermarket revenue, represented by higher parts and service revenues, rental income and used equipment sales, as well as a $6.6 million increase in vacuum truck shipments. The acquisition of TBEI also contributed $1.1 million of incremental sales. Partially offsetting these improvements was a $16.1 million reduction in sales of products manufactured by other companies, such as refuse trucks.

Cost of sales increased by $117.1 million, or 21%, for the year ended December 31, 2018, primarily attributable to increased sales volumes, the effects of a full year of TBEI activity in the current year compared with seven months in the prior year, higher material costs and a $3.7 million increase in depreciation expense, partially offset by a $3.7 million reduction in purchase accounting expenses. Gross margin increased to 22.9% from 20.8% in the prior-year period, primarily due to improved operating leverage, benefits from pricing actions taken in response to higher commodity costs, favorable sales mix and the reduction in purchase accounting expenses, partially offset by the higher depreciation expense.

SEG&A expenses increased by $13.2 million, or 19%, for the year ended December 31, 2018, largely due to the addition of expenses associated with the TBEI acquisition, including an increase in amortization expense of $3.2 million. As a percentage of net sales, SEG&A expenses decreased from 10.2% in the prior year, to 9.7% in the current year.

Operating income for the year ended December 31, 2018 increased by $40.6 million, or 56%, largely due to the $53.8 million increase in gross profit, partially offset by the $13.2 million increase in SEG&A expenses.

Backlog was $310.3 million at December 31, 2018, up 34% compared to $231.1 million at December 31, 2017. The increase is primarily due to the effects of improved demand for vacuum trucks, sewer cleaners and street sweepers in the U.S.

Year ended December 31, 2017 vs. year ended December 31, 2016

Total orders increased by $331.5 million, or 70%, for the year ended December 31, 2017. U.S. orders increased by $295.9 million, largely due to improvements in orders for sewer cleaners, vacuum trucks and street sweepers of $49.7 million, $43.1 million and $32.5 million, respectively, as well as the impact of the TBEI acquisition, which contributed $151.9 million of orders. Street sweeper and sewer cleaner order improvements were primarily driven by increased demand within municipal and industrial markets, while the increase in vacuum truck orders was associated with improved conditions in industrial markets in

comparison to the prior year, when there was a higher amount of used equipment in some of our end markets. The improvement in vacuum truck orders was also reflective of our strategic initiative to expand into the utility market, and the replenishment of customer rental fleets. Non-U.S. orders increased by $35.6 million, primarily attributed to the acquisition of JJE, completed in June 2016.

Net sales increased by $201.9 million, or 41%, for the year ended December 31, 2017. U.S. sales increased by $166.7 million, or 45%, primarily due to the 2017 acquisition of TBEI which contributed $109.0 million of sales, and increases in shipments of vacuum trucks, sewer cleaners and waterblasting equipment of $21.1 million, $10.7 million and $3.9 million, respectively. In addition, rental income and sales of used equipment improved by $5.5 million and $7.5 million, respectively, largely due to 2017 including a full year of JJE activity compared with seven months in 2016. Partially offsetting these improvements was a $2.0 million decrease in street sweeper sales. Non-U.S. sales increased by $35.2 million, or 30%, primarily due to the effects of the additional JJE activity in 2017, including increases in rental income and sales of used equipment of $7.6 million and $1.8 million, respectively.

Cost of sales increased by $162.4 million, or 42%, for the year ended December 31, 2017, primarily attributable to higher sales volumes, additional cost of sales from the TBEI acquisition and the effects of a full year of JJE activity in 2017, recognition of approximately $0.8 million more expense associated with purchase accounting effects and a $6.5 million increase in depreciation expense, largely resulting from depreciation on rental equipment acquired in the JJE transaction. Gross margin decreased to 20.8% from 21.3% in the prior year, largely due to the aforementioned incremental depreciation and purchase accounting expense effects.

SEG&A expenses increased by $21.1 million, or 43%, for the year ended December 31, 2017, largely due to the addition of expenses of businesses acquired, a $4.7 million increase in amortization expense and strategic investments in our sales force to support our organic growth initiatives.

Operating income for the year ended December 31, 2017 increased by $17.9 million, or 33%, largely due to the $39.5 million increase in gross profit, partially offset by the $21.1 million increase in SEG&A expenses and a $0.5 million increase in acquisition and integration-related expenses.

Backlog was $231.1 million at December 31, 2017, up 98% compared to $116.6 million at December 31, 2016. The increase is primarily due to the contribution of $42.5 million of backlog from TBEI, as well as the effects of improved demand for sewer cleaners, vacuum trucks, and street sweepers in the U.S.

Safety and Security Systems

The following table summarizes the Safety and Security Systems Group’s operating results as of and for the years ended December 31, 2018, 2017 and 2016:

	For the Years Ended December 31,			Change	
($ in millions)	2018	2017	2016	2018 vs. 2017	2017 vs. 2016
Net sales	$226.0	$205.9	$217.2	$20.1	$(11.3)
Operating income	34.1	27.0	27.9	7.1	(0.9)
Other data:					
Operating margin	15.1 %	13.1 %	12.8 %	2.0 %	0.3 %
Total orders	$227.4	$211.7	$199.6	$15.7	$12.1
Backlog	27.4	26.4	20.4	1.0	6.0
Depreciation and amortization	3.7	4.1	4.4	(0.4)	(0.3)

Year ended December 31, 2018 vs. year ended December 31, 2017

Total orders increased by $15.7 million or 7%, for the year ended December 31, 2018. In the aggregate, U.S. orders increased by $4.0 million, or 3%, compared to the prior year, driven by increases in orders for public safety products and industrial products of $5.4 million and $1.6 million, respectively. These increases were partially offset by a $3.0 million reduction in orders for outdoor warning systems. Non-U.S. orders increased by $11.7 million, or 16%, largely

due to a $9.5 million increase in orders for public safety products, a $2.1 million favorable foreign currency translation impact, and a $0.6 million increase in orders for outdoor warnings systems, partially offset by a $0.5 million reduction in orders for industrial products.

Net sales increased by $20.1 million, or 10%, for the year ended December 31, 2018. U.S. sales increased by approximately $5.8 million, primarily due to increases in sales of public safety and industrial products of $8.1 million and $0.4 million, respectively. Partially offsetting these increases was a $2.7 million reduction in sales of outdoor warning products. Non-U.S.

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sales increased by $14.3 million, primarily driven by increases in sales of public safety products and outdoor warning systems of $7.5 million and $5.1 million, respectively, as well as a $1.7 million favorable foreign currency translation impact.

Cost of sales increased by $13.0 million, or 10%, for the year ended December 31, 2018, largely due to higher sales volumes and an unfavorable foreign currency translation impact of $1.3 million. Gross margin for the year ended December 31, 2018 was 37.3%, compared to 37.5% in the prior year.

SEG&A expenses for the year ended December 31, 2018 were $0.6 million, or 1%, higher than the prior year, primarily due to increased expenses associated with new product development and other growth initiatives. As a percentage of net sales, SEG&A expenses decreased from 24.1% in the prior year, to 22.2% in the current year.

Operating income for the year ended December 31, 2018 increased by $7.1 million, or 26%, largely due to the $7.1 million increase in gross profit and a $0.6 million reduction in restructuring charges, partially offset by the $0.6 million increase in SEG&A expenses.

Backlog was $27.4 million at December 31, 2018 compared to $26.4 million at December 31, 2017. The increase was primarily due to increased orders for public safety products.

Year ended December 31, 2017 vs. year ended December 31, 2016

Total orders increased by $12.1 million or 6%, for the year ended December 31, 2017. In the aggregate, U.S. orders increased by $6.9 million compared to the prior year, driven by increases in orders of outdoor warning systems, public safety products and industrial products of $3.4 million, $2.9 million and $0.6 million, respectively. Non-US orders increased by $5.2 million, largely due to a $6.8 million increase in orders from international industrial markets, including oil and gas and coal markets, partially offset by a $1.6 million decrease in orders of international public safety products.

Net sales decreased by $11.3 million, or 5%, for the year ended December 31, 2017. U.S. sales decreased by approximately $4.4 million, primarily due to decreased sales of public safety products and outdoor warning systems of $3.0 million and $3.3 million, respectively. The reduction in sales of both public safety products and outdoor warnings systems was primarily attributable to fewer large orders when compared to the prior year. Partially offsetting these decreases was a $1.9 million improvement in sales of industrial products. Non-U.S. sales decreased by $6.9 million, primarily driven by a $5.8 million reduction in sales into international public safety markets and a $2.4 million decrease in sales of outdoor warning systems. Partially offsetting these decreases was a $1.3 million improvement in sales of industrial products into international industrial markets, including oil and gas and coal markets.

Cost of sales decreased by $9.6 million, or 7%, for the year ended December 31, 2017, largely due to the effects of lower sales volumes, as well as the effects of material cost reduction initiatives implemented in 2017 and 2016. These actions contributed to an improved gross margin for the year ended December 31, 2017 of 37.5%, compared to 36.3% in the prior year.

SEG&A expenses for the year ended December 31, 2017 were $0.3 million higher than the prior year, with additional expenses associated with strategic investments in support of new product development and other growth initiatives being partially offset by savings realized from prior year restructuring activities.

Operating income for the year ended December 31, 2017 decreased by $0.9 million, with the $1.7 million decrease in gross profit and $0.3 million increase in SEG&A expenses being partially offset by a $1.1 million reduction in restructuring charges.

Backlog was $26.4 million at December 31, 2017 compared to $20.4 million at December 31, 2016. The increase was primarily due to increased orders for outdoor warnings systems, as well as large police orders within public safety markets that were received in the fourth quarter of 2017.

Corporate Expense

Corporate operating expenses were $25.6 million, $25.8 million and $21.6 million for the years ended December 31, 2018, 2017 and 2016, respectively.

For the year ended December 31, 2018, corporate operating expenses decreased by $0.2 million, primarily driven by a $1.2 million decrease in acquisition and integration-related expenses, reductions in hearing loss litigation and

post-employment expenses and the absence of $0.7 million in executive severance costs, partially offset by higher employee incentive and stock compensation costs.

For the year ended December 31, 2017, corporate operating expenses increased by $4.2 million, primarily driven by a $0.8 million increase in acquisition and integration-related expenses associated with the TBEI acquisition, the recognition of $0.7

million in executive severance costs, increased legal expenses associated with hearing loss litigation and higher employee incentive compensation costs.

The Company's hearing loss litigation has historically been managed by the Company's legal staff resident at the corporate office and not by management at either segment. In accordance with Accounting Standards Codification ("ASC") 280, Segment Reporting, which provides that segment reporting should follow the management of the item and that certain expenses may be corporate expenses, these legal expenses (which are not part of the normal operating activities of any of our reportable segments) are reported and managed as corporate expenses.

Financial Condition, Liquidity and Capital Resources

The Company uses its cash flow from operations to fund growth and to make capital investments that sustain its operations, reduce costs, or both. Beyond these uses, remaining cash is used to pay down debt, repurchase shares, fund dividend payments and make pension contributions. The Company may also choose to invest in the acquisition of businesses. In the absence of significant unanticipated cash demands, we believe that the Company's existing cash balances, cash flow from operations and borrowings available under the Amended 2016 Credit Agreement will provide funds sufficient for these purposes. The net cash flows associated with the Company's rental equipment transactions are included in cash flow from operating activities. Subsequent to the acquisition of JJE, net cash flows from rental equipment transactions have become more significant, and as such, cash flow from operating activities may not be directly comparable with amounts reported in periods prior to the acquisition.

The Company's cash and cash equivalents totaled $37.4 million, $37.5 million and $50.7 million as of December 31, 2018, 2017 and 2016, respectively. As of December 31, 2018, $19.9 million of cash and cash equivalents was held by foreign subsidiaries. Cash and cash equivalents held by subsidiaries outside the U.S. typically are held in the currency of the country in which it is located. This cash is used to fund the operating activities of our foreign subsidiaries and for further investment in foreign operations. Historically, we considered such cash to be permanently reinvested in our foreign operations and our current plans do not demonstrate a need to repatriate such cash to fund U.S. operations. However, in the event that these funds were needed to fund U.S. operations or to satisfy U.S. obligations, they generally could be repatriated. The repatriation of these funds may have caused us to incur additional U.S. income tax expense, dependent on income tax laws and other circumstances at the time any such amounts were repatriated.

The 2017 Tax Act provided a one-time "transition tax" on untaxed post-1986 accumulated earnings and profits ("E&P") of a company's controlled foreign corporations ("CFC") determined as of November 2, 2017 or December 31, 2017 (whichever date on which there is more deferred E&P). As disclosed in Note 9 - Income Taxes, the Company's accumulated undistributed earnings of foreign subsidiaries aggregated to an overall E&P deficit. Therefore, the Company did not have a transition tax liability under the provisions of the 2017 Tax Act. As of December 31, 2018, the Company continues to assert that its undistributed earnings of certain foreign subsidiaries are indefinitely reinvested. The Company will continue to evaluate its U.S. and foreign cash needs and, as circumstances change, may change its assertion related to all or a portion of its undistributed foreign earnings.

Net cash provided by continuing operating activities totaled $92.8 million, $73.5 million and $26.7 million in 2018, 2017 and 2016, respectively. The $19.3 million, or 26%, increase in cash generated by continuing operating activities in 2018 compared to the prior year was primarily due to higher earnings and additional cash generated by TBEI in a full-year of activity this year compared to seven months in the prior year. These improvements were partially offset by increases in income tax payments and pension contributions of $7.7 million and $2.4 million, respectively, as well as higher incentive compensation payments in comparison to the prior year.

Net cash used for continuing investing activities totaled $11.0 million, $277.1 million and $103.0 million in 2018, 2017 and 2016, respectively. In each of the years presented, cash was used to fund the purchase of properties and equipment, with $14.1 million, $8.0 million and $6.1 million of capital expenditures in 2018, 2017 and 2016, respectively. As discussed in Note 3 – Acquisitions, in 2018, the Company received an adjustment for working capital and other post-closing items in the amount of $3.0 million relating to the TBEI acquisition, which was completed in 2017 for an initial payment of $269.2 million. In 2016, the Company paid $96.6 million to acquire substantially all the assets and operations of JJE, and also used $6.0 million to acquire Westech. In addition, during 2016, the Company

received $6.0 million from a customer as full repayment of a loan that was originally provided in the fourth quarter of 2015. Net cash provided by discontinued investing activities totaled $86.2 million in 2016, which represented the net proceeds from the sale of Bronto.

In 2018, net cash of $81.2 million was used for continuing financing activities, while in 2017, net cash of $190.7 million was provided by continuing financing activities. In 2018, the Company repaid $62.1 million of borrowings under its revolving credit facility, funded cash dividends of $18.7 million and repurchased $1.2 million of treasury stock. In 2017, in connection with the funding of the acquisition of TBEI, the Company borrowed $243.0 million against its revolving credit facility.

Between the TBEI acquisition date and the end of 2017, approximately $34 million of net borrowings were repaid. In addition, the Company funded cash dividends of $16.8 million and redeemed $2.9 million of stock in order to remit funds to tax authorities to satisfy employees' minimum tax withholdings following the vesting of stock-based compensation. In 2016, the Company borrowed $64.8 million against its revolving credit facility, funded cash dividends of $16.9 million, repurchased $37.8 million of treasury stock, and redeemed $2.7 million of stock in order to remit funds to tax authorities to satisfy employees' minimum tax withholdings following the vesting of stock-based compensation. The Company also paid the remaining $43.4 million of term loan debt outstanding under the Company's March 13, 2013 Credit Agreement (the "2013 Credit Agreement") and spent $1.1 million on fees in connection with its debt refinancing.

On January 27, 2016, the Company entered into an Amended and Restated Credit Agreement (the "2016 Credit Agreement"), by and among the Company and certain of its foreign subsidiaries (collectively, the "Borrowers"), Wells Fargo Bank, National Association, as administrative agent, swingline lender and issuing lender, JPMorgan Chase Bank, N.A. as syndication agent, KeyBank National Association, as documentation agent, Wells Fargo Securities, LLC and J.P. Morgan Securities LLC, as joint lead arrangers and joint bookrunners, and the other lenders and parties signatory thereto.

The 2016 Credit Agreement provided for a $325.0 million revolving credit facility, maturing on January 27, 2021, with borrowings in the form of loans or letters of credit up to the aggregate availability under the facility, with a sub-limit of $50.0 million for letters of credit.

On June 2, 2017, in anticipation of the TBEI acquisition, the Company executed an amendment to the 2016 Credit Agreement (as amended, the "Amended 2016 Credit Agreement"), which increased the borrowing capacity under the Amended 2016 Credit Agreement to $400.0 million. In addition, the Amended 2016 Credit Agreement includes an accordion feature, whereby the Company may cause the commitments to increase by up to an additional $75.0 million, subject to the approval of the applicable lenders providing such additional financing.

The Amended 2016 Credit Agreement allows for the Borrowers to borrow in denominations of U.S. Dollars, Canadian Dollars (up to a maximum of C$100.0 million) or Euros (up to a maximum of €20.0 million). Borrowings under the Amended 2016 Credit Agreement may be used for working capital and general corporate purposes, including permitted acquisitions.

The Company's domestic subsidiaries provide guarantees for all obligations of the Borrowers under the Amended 2016 Credit Agreement, which is secured by a first priority security interest in all now or hereafter acquired domestic property and assets and the stock or other equity interests in each of the domestic subsidiaries and 65% of the outstanding voting capital stock of certain first-tier foreign subsidiaries, subject to certain exclusions.

Borrowings under the Amended 2016 Credit Agreement bear interest, at the Company's option, at a base rate or a LIBOR rate, plus, in each case, an applicable margin. The applicable margin ranges from 0.00% to 1.25% for base rate borrowings and 1.00% to 2.25% for LIBOR borrowings. The Company must also pay a commitment fee to the lenders ranging between 0.15% to 0.30% per annum on the unused portion of the $400.0 million revolving credit facility along with other standard fees. Letter of credit fees are payable on outstanding letters of credit in an amount equal to the applicable LIBOR margin plus other customary fees.

The Company is subject to certain leverage ratio and interest coverage ratio financial covenants under the Amended 2016 Credit Agreement that are to be measured at each fiscal quarter-end. The Company was in compliance with all such covenants as of December 31, 2018. Although it has not been triggered by the Company, the Amended 2016 Credit Agreement also includes a "covenant holiday" period, which allows for the temporary increase of the minimum leverage ratio following the completion of a permitted acquisition, or a series of permitted acquisitions, when the total consideration exceeds a specified threshold. In addition, the Amended 2016 Credit Agreement includes customary negative covenants, subject to certain exceptions, restricting or limiting the Company's and its subsidiaries' ability to, among other things: (i) make non-ordinary course dispositions of assets, (ii) make certain fundamental business changes, such as merge, consolidate or enter into any similar combination, (iii) make restricted payments, including dividends and stock repurchases, (iv) incur indebtedness, (v) make certain loans and investments, (vi) create liens,

(vii) transact with affiliates, (viii) enter into sale/leaseback transactions, (ix) make negative pledges and (x) modify subordinated debt documents.

Under the Amended 2016 Credit Agreement, restricted payments, including dividends and stock repurchases, shall be permitted if (i) the Company's leverage ratio is less than or equal to 2.50, (ii) the Company is in compliance with all other financial covenants and (iii) there are no existing defaults under the Amended 2016 Credit Agreement. If its leverage ratio is more than 2.50, the Company is still permitted to fund (i) up to $30.0 million of dividend payments, (ii) stock repurchases sufficient to offset dilution created by the issuance of equity as compensation to its officer, directors, employees and consultants and (iii) an incremental $30.0 million of other cash payments.

The Amended 2016 Credit Agreement contains customary events of default. If an event of default occurs and is continuing, the Borrowers may be required immediately to repay all amounts outstanding under the Amended 2016 Credit Agreement and the commitments from the lenders may be terminated.

In connection with its debt refinancing in the year ended December 31, 2016, the Company repaid the remaining $43.4 million of principal outstanding under the 2013 Credit Agreement and wrote off approximately $0.3 million of associated unamortized deferred financing fees. The Company incurred $1.1 million of debt issuance costs in connection with the execution of the 2016 Credit Agreement. Such fees have been deferred and are being amortized over the five-year term.

As of December 31, 2018, there was $209.4 million of cash drawn and $11.3 million of undrawn letters of credit under the Amended 2016 Credit Agreement, with $179.3 million of net availability for borrowings.

For the year ended December 31, 2018, gross payments and gross borrowings under the Amended 2016 Credit Agreement were$70.1 million and $8.0 million, respectively. For the year ended December 31, 2017, gross borrowings and gross payments under the 2016 Credit Agreement and the Amended 2016 Credit Agreement were $262.7 million and $53.6 million, respectively. For the year ended December 31, 2016, gross borrowings and gross payments under the 2016 Credit Agreement were $69.8 million and $5.0 million, respectively.

Aggregate maturities of total borrowings due amount to approximately $0.2 million in 2019, $0.2 million in 2020, $209.6 million in 2021 and $0.1 million in 2022. The weighted average interest rate on long-term borrowings was 3.3% at December 31, 2018.

The Company paid interest of $8.7 million in 2018, $6.6 million in 2017 and $1.1 million in 2016.

The Company paid income taxes of $21.6 million in 2018, $13.9 million in 2017 and $13.3 million in 2016.

Cash dividends of $18.7 million, $16.8 million and $16.9 million were declared and paid to stockholders in 2018, 2017 and 2016, respectively.

The Company recently announced plans to expand the primary production facility of its Vactor Manufacturing, Inc. subsidiary. Over the course of the expansion project, the Company is expecting to invest up to $25 million. The Company anticipates that capital expenditures for 2019, excluding investment associated with the Vactor plant expansion, will be in the range of $15 million to $20 million. The Company believes that its financial resources and major sources of liquidity, including cash flow from operations and borrowing capacity, will be adequate to meet its operating needs, capital needs and financial commitments.

Contractual Obligations and Off-Balance Sheet Arrangements

The following table summarizes the Company’s contractual obligations and payments due by period as of December 31, 2018:

	Payments Due by Period				
(in millions)	Total	Less than 1 Year	2-3 Years	4-5 Years	More than 5 Years
Long-term debt	$209.4	$ —	$ 209.4	$ —	$ —
Interest payments on long-term debt [(a)]	13.6	6.8	6.8	—	—
Operating lease obligations	34.3	8.9	14.9	9.3	1.2
Capital lease obligations	0.7	0.2	0.4	0.1	—
Purchase obligations [(b)]	115.0	112.4	2.6	—	—
Pension contributions [(c)]	1.3	1.3	—	—	—
Contingent earn-out payment and deferred payment [(d)]	12.4	12.4	—	—	—
Total contractual obligations [(e)]	$386.7	$ 142.0	$ 234.1	$ 9.4	$ 1.2

(a) Amounts represent estimated contractual interest payments on outstanding long-term debt.

(b) Purchase obligations primarily relate to commercial chassis and other contracts in the ordinary course of business.

(c) The Company expects to contribute up to $1.3 million to the non-U.S. benefit plan in 2019, which represents the minimum required contribution. The Company does not currently expect to make any contributions to the U.S. benefit plan in 2019. Future contributions to the plans will be based on such factors as (i) annual service cost, (ii)

the financial return on plan assets, (iii) interest rate movements that affect discount rates applied to plan liabilities and (iv) the value of benefit payments made. Due to the high degree of uncertainty regarding the potential future cash outflows associated with these plans, the Company is unable to provide a reasonably reliable estimate of the amounts and periods in which any additional liabilities might be paid.

(d) Represents the fair value of the contingent earn-out payment and deferred payment associated with the acquisition of JJE. For further discussion, see Note 3 – Acquisitions to the accompanying consolidated financial statements.

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(e) As of December 31, 2018, the Company had a liability of approximately $1.6 million for unrecognized tax benefits. For further discussion, see Note 9 – Income Taxes to the accompanying consolidated financial statements. Due to the uncertainties related to these tax matters, the Company generally cannot make a reasonably reliable estimate of the period of cash settlement for this liability. As such, the potential future cash outflows are not included in the table above. We do not expect any significant change to our unrecognized tax benefits as a result of potential expiration of statute of limitations and settlements with tax authorities.

The following table summarizes the Company's off-balance sheet arrangements and the notional amount by expiration period as of December 31, 2018:

	Notional Amount by Expiration Period			
(in millions)	Total	Less than 1 Year	2-3 Years	4-5 Years
Financial standby letters of credit [(a)]	$ 10.7	$ 10.7	$ —	$ —
Performance standby letters of credit [(a)]	0.6	0.6	—	—
Performance and bid bonds [(b)]	6.9	6.8	0.1	—
Repurchase obligations [(c)]	4.3	3.5	0.8	—
Total off-balance sheet arrangements	$ 22.5	$ 21.6	$ 0.9	$ —

(a) Financial standby letters of credit largely relate to casualty insurance policies for the Company's workers' compensation, automobile, general liability and product liability policies. Performance standby letters of credit primarily represent guarantees of performance of certain subsidiaries that engage in transactions with foreign customers.

(b) Performance and bid bonds primarily relate to guarantees of performance of certain subsidiaries that engage in transactions with domestic and foreign customers.

(c) Relates to certain transactions that the Company has entered into involving the sale of equipment to certain of its customers which included (i) guarantees to repurchase the equipment for a fixed price at a future date and (ii) guarantees to repurchase the equipment from the third-party lender in the event of default by the customer. For further discussion, see Note 11 – Commitments and Contingencies to the accompanying consolidated financial statements.

Critical Accounting Policies and Estimates

The preparation of consolidated financial statements in conformity with U.S. generally accepted accounting principles ("GAAP") requires management to make estimates and assumptions that affect (i) the reported amounts of assets and liabilities, (ii) disclosure of contingent assets and liabilities at the date of the consolidated financial statements and (iii) the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates. The Company considers the following policies to be the most critical in understanding the judgments that are involved in the preparation of the Company's consolidated financial statements and the uncertainties that could impact the Company's financial condition, results of operations or cash flow.

Goodwill

Goodwill represents the excess of the cost of an acquired business over the amounts assigned to its net assets. Goodwill is not amortized but is tested for impairment at a reporting unit level on an annual basis or more frequently if indicators of impairment exist. The Company performed its annual goodwill impairment test as of October 31, 2018.

Effective January 1, 2018, the Company adopted ASU No. 2017-04, Intangibles – Goodwill and Other (Topic 350), Simplifying the Test for Goodwill Impairment, which eliminated the second step of the two-step quantitative approach for testing goodwill for potential impairment. Under ASU 2017-04, an entity performs the goodwill impairment test by comparing the fair value of a reporting unit with its carrying amount, and recognizes an impairment charge for the amount by which the carrying amount exceeds the fair value, not to exceed the total amount of goodwill allocated to the reporting unit. An entity still has the option to perform a qualitative assessment to determine if the quantitative impairment test is necessary. The Company applied the guidance in ASU 2017-04 it to its 2018 annual goodwill

impairment test. See Note 1 - Summary of Significant Accounting Policies for further discussion regarding the Company's adoption of this new accounting pronouncement.

A qualitative approach is applied when the Company concludes that it is not "more likely than not" that the fair value of a reporting unit is less than its carrying value. In this situation, the Company would not be required to perform the quantitative impairment test described below. Management applied the qualitative approach to assess the goodwill of its reporting units for potential impairment in 2018 and 2017 and concluded that it was not "more likely than not" that the fair value of the Company's reporting units were less than their carrying values.

As previously described, the quantitative approach is used to identify potential impairment by comparing the fair value of a reporting unit with its carrying amount, including goodwill. If the fair value of a reporting unit exceeds its carrying amount, goodwill of the reporting unit is not impaired and no impairment charge is required. If the carrying amount of a reporting unit exceeds its fair value, this difference is recorded as an impairment charge not to exceed the carrying amount of goodwill. The

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Company generally determines the fair value of its reporting units using two valuation methods: the “Income Approach — Discounted Cash Flow Analysis” method, and the “Market Approach — Guideline Public Company Method.” Under the “Income Approach — Discounted Cash Flow Analysis” method, the key assumptions consider projected sales, cost of sales and operating expenses. These assumptions are determined by management utilizing our internal operating plan, including growth rates for revenues and operating expenses and margin assumptions. An additional key assumption under this approach is the discount rate, which is determined by reviewing current risk-free rates of capital and current market interest rates and by evaluating the risk premium relevant to the business segment. If our assumptions relative to growth rates were to change, our fair value calculation may change, which could result in impairment.

Under the “Market Approach — Guideline Public Company Method,” the Company identifies several publicly traded companies, which we believe have sufficiently relevant similarities to our businesses. For these companies, the Company uses market values to calculate the mean ratio of invested capital to revenues and invested capital to EBITDA. Similar to the income approach discussed above, sales, cost of sales, operating expenses and their respective growth rates are key assumptions utilized. The market prices of the Company’s common stock and other guideline companies are additional key inputs. If these market prices increase, the estimated market value would increase. Conversely, if market prices decrease, the estimated market value would decrease.

The results of these two methods are weighted based upon management’s evaluation of the relevance of the two approaches.

Although the Company believes its estimates of fair value are reasonable, actual financial results could differ from estimated financial results due to the inherent uncertainty involved in making such estimates. Changes in assumptions concerning future financial results or other underlying assumptions could have a significant impact on either the fair value of the reporting units, the amount of any goodwill impairment charge, or both. Future declines in the overall market value of the Company may also result in a conclusion that the fair value of one or more reporting units has declined below its carrying value.

One measure of the sensitivity of assumptions used in the impairment analysis is the amount by which each reporting unit “passed” (fair value exceeds the carrying value). The fair value of the reporting units that were tested for impairment under the first-step of the former two-step approach in the most recent quantitative analysis performed in 2016 significantly exceeded their carrying values. Relatively small changes in the Company’s key assumptions would not have resulted in any of these reporting units failing the two-step test.

The Company had no goodwill impairments in 2018, 2017 or 2016. Adverse changes to the Company’s business environment and future cash flow could cause us to record impairment charges in future periods, which could be material. See Note 7 – Goodwill and Other Intangible Assets to the accompanying consolidated financial statements for a summary of the Company’s goodwill by segment.

Indefinite-lived Intangible Assets

An intangible asset determined to have an indefinite useful life is not amortized. Indefinite-lived intangible assets are tested for impairment on an annual basis at year-end, or more frequently if an event occurs or circumstances change that indicate the fair value of an indefinite-lived intangible asset could be below its carrying amount. The Company’s indefinite-lived intangible assets include trade names associated primarily with the TBEI and JJE acquisitions that were completed in 2017 and 2016, respectively.

In testing the indefinite-lived intangibles assets for potential impairment, the Company applies either a qualitative test, or a quantitative test, in accordance with ASC 350, Intangibles — Goodwill and Other. A qualitative approach is applied when the Company concludes that it is not “more likely than not” that the fair value of the indefinite-lived intangibles are less than their carrying value. A quantitative impairment test consists of comparing the fair value of the indefinite-lived intangible asset with its carrying amount. An impairment loss would be recognized for the carrying amount in excess of its fair value. In 2018, 2017 and 2016, the Company applied a qualitative approach. Based on the proximity of the relevant acquisition dates to the annual impairment test dates and the post-acquisition performance of the businesses compared to the related valuation assumptions, the Company concluded that it was not “more likely than

not" that the fair value of indefinite-lived intangible assets were less than the carrying amounts.

Significant judgment is applied when evaluating whether an intangible asset has an indefinite useful life. In addition, for indefinite-lived intangible assets, significant judgment is applied in testing for impairment. This judgment includes developing cash flow projections, selecting appropriate discount rates, identifying relevant market comparables, and incorporating general economic and market conditions.

The Company had no indefinite-lived intangible asset impairments in 2018, 2017 or 2016. Although the Company believes its estimates of fair value are reasonable, actual financial results could differ from estimated financial results due to the inherent

uncertainty involved in making such estimates. The use of alternative estimates and assumptions could increase or decrease the estimated fair value of the assets and potentially result in different impacts to the Company's results of operations. Actual results may differ from the Company's estimates.

See Note 7 – Goodwill and Other Intangible Assets to the accompanying consolidated financial statements for a summary of the Company’s indefinite-lived intangible assets.

Revenue Recognition

Revenue is recognized when performance obligations under the terms of a contract with the customer are satisfied; generally this occurs at a point in time, with the transfer of control of the Company’s products or services to customers. For most of the Company’s product sales, these criteria are met at the time the product is shipped; however, occasionally control passes later or earlier than shipment due to customer contract or letter of credit terms. In circumstances where credit is extended, payment terms generally range from 30 to 120 days and customer deposits may be required.

Revenue is measured as the amount of consideration the Company expects to be entitled to in exchange for transferring products or providing services. Expected returns and allowances are estimated and recognized based primarily on an analysis of historical experience, with Net sales presented net of such returns and allowances.

The Company enters into sales arrangements that may provide for multiple performance obligations to a customer. These arrangements may include software and non-software components that function together to deliver the products’ essential functionality. The Company identifies all performance obligations that are to be delivered separately under the sales arrangement and allocates revenue to each performance obligation based on its relative standalone selling price. The Company uses an observable price to determine the standalone selling price or a cost plus margin approach when one is not available. In general, performance obligations include hardware, integration and installation services. The allocated revenue for each performance obligation is recognized as such performance obligations are satisfied.

Net sales include sales of products and billed freight related to product sales. Freight has not historically comprised a material component of Net sales. The Company has elected to account for such shipping and handling activities as a fulfillment cost and not as a separate performance obligation. Taxes collected from customers and remitted to governmental authorities are recorded on a net basis and are excluded from Net sales.

On January 1, 2018, the Company adopted ASC 606, Revenue from Contracts with Customers, as amended, and created by ASU 2014-09, Revenue from Contracts with Customers. See Note 2 - Revenue Recognition to the accompanying consolidated financial statements for further discussion regarding the impact of the adoption on the Company’s revenue recognition accounting policies.

Income Taxes

Deferred tax assets and liabilities are recognized for the estimated future tax consequences attributable to differences between the financial statement carrying values of existing assets and liabilities and their respective tax bases. Deferred tax assets are also recorded with respect to net operating losses and other tax attribute carryforwards. Deferred tax assets and liabilities are measured using enacted tax rates in effect for the years in which temporary differences are expected to be recovered or settled. Valuation allowances are established when it is more likely than not that deferred tax assets will not be realized. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in the income of the period that includes the enactment date.

Impact of the 2017 Tax Act

In December 2017, the 2017 Tax Act was enacted. Among its provisions, the 2017 Tax Act reduced the U.S. federal corporate tax rate from 35% to 21% (effective in 2018), required companies to pay a one-time transition tax on earnings of certain foreign subsidiaries that were previously tax deferred and created new taxes on certain foreign sourced earnings, including a new minimum tax on Global Intangible Low-Taxed Income (“GILTI”). As a result of the 2017 Tax Act, the Company remeasured its U.S. deferred tax assets and liabilities at the lower rate, recording a net tax benefit of $23.0 million as a component of Income tax expense on the Consolidated Statement of Operations for the year ended December 31, 2017.

In addition, the 2017 Tax Act moved the U.S. from a worldwide system of taxation to a territorial system and changed the rules that enabled taxpayers to generate foreign source income related to export sales. As a result of these changes, the Company concluded that it was not “more likely than not” that it could utilize its existing foreign tax credits within the applicable carryforward period and recognized a $3.0 million valuation allowance against the Company’s foreign tax credits as of December 31, 2017.

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The 2017 Tax Act also provides for a one-time "transition tax" on untaxed post-1986 accumulated E&P of a CFC determined as of November 2, 2017 or December 31, 2017 (whichever date on which there is more deferred E&P). Cash and cash equivalents are taxed at an effective rate of 15.5% and earnings in excess of the cash position are taxed at an effective rate of 8%. The 2017 Tax Act permits the netting of positive earnings of one CFC against deficits of others. At both November 2, 2017 and December 31, 2017, the accumulated undistributed earnings of the Company's foreign subsidiaries aggregated to an overall E&P deficit. Therefore, the Company did not have a transition tax liability under the provisions of the 2017 Tax Act. As of December 31, 2018, the Company continues to assert that its undistributed earnings of certain foreign subsidiaries are indefinitely reinvested. The Company will continue to evaluate its U.S. and foreign cash needs and, as circumstances change, may change its assertion related to all or a portion of its undistributed foreign earnings.

Due to the complexities of implementing the provisions of the 2017 Tax Act, the SEC staff issued Staff Accounting Bulletin No. 118 ("SAB 118"), which provides guidance on the accounting for the tax effects of the 2017 Tax Act and permits a measurement period not to exceed one year from the enactment date for companies to complete the required analyses and accounting. The consolidated financial statements for the year ended December 31, 2017 included the Company's provisional estimates of the impact of the 2017 Tax Act, in accordance with SAB 118. The SAB 118 measurement period ended during the fourth quarter of 2018 and the Company had no significant measurement period adjustments. Additionally, the Company has completed its assessment of GILTI and has established a policy to account for this tax as a period expense in the year it is incurred.

Valuation Allowances

The guidance on accounting for income taxes provides important factors in determining whether a deferred tax asset will be realized, including whether there has been sufficient taxable income in recent years and whether sufficient income can reasonably be expected in future years in order to utilize the deferred tax asset. A high degree of judgment is required to determine if, and the extent that, valuation allowances should be recorded against deferred tax assets. A valuation allowance is required to be established or maintained when, based on currently available information and other factors, it is more likely than not that all or a portion of a deferred tax asset will not be realized.

We continually evaluate the need to maintain a valuation allowance for deferred tax assets based on our assessment of whether it is more likely than not that deferred tax benefits will be realized through the generation of future taxable income. Appropriate consideration is given to all available evidence, both positive and negative, in assessing the need for a valuation allowance.

There were no significant changes in judgment related to the realizability of deferred tax assets during the year ended December 31, 2018. At December 31, 2018, the total valuation allowance recorded against the Company's deferred tax assets was $9.4 million, comprised of a $5.3 million valuation allowance recorded against state net operating loss carryforwards, a $1.0 million valuation allowance recorded against foreign net deferred tax assets, inclusive of a $0.8 million valuation allowance against net deferred tax assets in the U.K., and a $3.1 million valuation allowance recorded against the Company's foreign tax credits, primarily as a result of the 2017 Tax Act, as discussed above.

Unrecognized Tax Benefits

Accounting for uncertainty in income taxes addresses the determination of whether tax benefits claimed or expected to be claimed on a tax return should be recorded in the consolidated financial statements. We recognize the tax benefit from an uncertain tax position if it is more likely than not that the tax position will be sustained on examination by taxing authorities, based on the technical merits of the position. The tax benefits recognized in the consolidated financial statements from such a position are measured based on the largest benefit that has a greater than 50% likelihood of being realized upon ultimate settlement.

The guidance on accounting for uncertainty in income taxes also outlines de-recognition and classification, and requires companies to elect and disclose their method of reporting interest and penalties on income taxes. We recognize interest and penalties related to uncertain tax positions as part of income tax expense.

We believe that our approach to the associated estimates and judgments applied to our tax positions as described herein is reasonable; however, actual results could differ and we may be exposed to increases or decreases in income

taxes that could be material.

For further discussion related to the impact of the 2017 Tax Act, valuation allowances, unrecognized tax benefits and other tax matters, refer to Note 9 – Income Taxes to the accompanying consolidated financial statements.

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Item 7A. Quantitative and Qualitative Disclosures about Market Risk.

The Company is subject to market risk associated with changes in interest rates and foreign exchange rates. To mitigate this risk, the Company may utilize derivative financial instruments, including interest rate swaps and foreign currency forward contracts. The Company does not hold or issue derivative financial instruments for trading or speculative purposes and is not party to leveraged derivatives contracts.

Interest Rate Risk

Our debt instruments subject us to market risk associated with movements in interest rates. The fair value of the Company's total debt obligations held at December 31, 2018 was $210.1 million. On June 2, 2017, the Company entered into an interest rate swap with a notional amount of $150.0 million, as a means of fixing the floating interest rate component on $150.0 million of its variable-rate debt. See Note 8 – Debt to the accompanying consolidated financial statements for a description of our debt agreements. A hypothetical 1% increase or decrease in variable interest rates in 2018 would increase or decrease annual interest expense by approximately $0.6 million, based on current debt levels.

Foreign Exchange Rate Risk

Although the majority of the Company's sales, expenses and cash flow are transacted in U.S. dollars, the Company has exposure to changes in foreign exchange rates, primarily the Canadian Dollar, Euro and British pound. The impact of currency movements on our financial results is largely mitigated by natural hedges in our operations. The Canadian operations of JJE primarily conduct business in Canadian dollars. Almost all other sales of product from the U.S. to other parts of the world are denominated in U.S. dollars. Sales from and within other currency zones are predominantly transacted in the currency of the country sourcing the product or service. Approximately 78% of our total sales are conducted within the U.S. and are transacted in U.S. dollars. Management estimates that a 10% appreciation of the U.S. dollar against other currencies would reduce full-year net sales by approximately 2% and operating income by approximately 1%.

The Company may also have foreign currency exposures related to buying and selling in currencies other than the local currency in which it operates and to certain balance sheet positions. If such transactional or balance sheet exposures are material, the Company may enter into matching foreign currency forward contracts from time to time to protect against variability in exchange rates.

Item 8. Financial Statements and Supplementary Data.

FEDERAL SIGNAL CORPORATION

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Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of Federal Signal Corporation
Oak Brook, Illinois

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Federal Signal Corporation and subsidiaries (the "Company") as of December 31, 2018 and 2017, 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, 2018, and the related notes and the financial statement schedule listed in the Index at Item 15 (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018, in conformity with accounting principles generally accepted in the United States of America.

We have also 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, 2018, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated February 28, 2019, expressed an unqualified opinion on the Company's internal control over financial reporting.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's consolidated 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 consolidated 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 consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ Deloitte & Touche LLP
Chicago, Illinois
February 28, 2019

We have served as the Company's auditor since 2013.

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Report of Independent Registered Public Accounting Firm
To the Board of Directors and Stockholders of Federal Signal Corporation
Oak Brook, Illinois
Opinion on Internal Control over Financial Reporting
We have audited the internal control over financial reporting of Federal Signal Corporation and subsidiaries (the "Company") as of December 31, 2018, based on criteria established in Internal Control — Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control — Integrated Framework (2013) issued by COSO.
We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated financial statements, as of and for the year ended December 31, 2018, of the Company and our report dated February 28, 2019 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 Annual 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 the controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ Deloitte & Touche LLP
Chicago, Illinois
February 28, 2019

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FEDERAL SIGNAL CORPORATION AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF OPERATIONS

	For the Years Ended December 31,		
(in millions, except per share data)	2018	2017	2016
Net sales	$1,089.5	$898.5	$707.9
Cost of sales	807.4	677.3	524.5
Gross profit	282.1	221.2	183.4
Selling, engineering, general and administrative expenses	159.1	144.3	119.5
Acquisition and integration-related expenses	1.5	2.7	1.4
Restructuring	—	0.6	1.7
Operating income	121.5	73.6	60.8
Interest expense	9.3	7.3	1.9
Debt settlement charges	—	—	0.3
Pension settlement charges	—	6.1	—
Other expense (income), net	0.6	(0.8)	1.8
Income before income taxes	111.6	61.0	56.8
Income tax expense	17.9	0.5	17.4
Income from continuing operations	93.7	60.5	39.4
Gain from discontinued operations and disposal, net of income tax expense (benefit) of $0.1, $(0.8) and $3.4, respectively	0.3	1.1	4.4
Net income	$94.0	$61.6	$43.8
Basic earnings per share:			
Earnings from continuing operations	$1.56	$1.01	$0.65
Earnings from discontinued operations and disposal, net of tax	0.01	0.02	0.07
Net earnings per share	$1.57	$1.03	$0.72
Diluted earnings per share:			
Earnings from continuing operations	$1.53	$1.00	$0.64
Earnings from discontinued operations and disposal, net of tax	0.01	0.02	0.07
Net earnings per share	$1.54	$1.02	$0.71
Weighted average shares outstanding:			
Basic	59.9	59.7	60.4
Diluted	61.2	60.4	61.2

See notes to consolidated financial statements.

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FEDERAL SIGNAL CORPORATION AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

	For the Years Ended December 31,		
(in millions)	2018	2017	2016
Net income	$94.0	$61.6	$43.8
Other comprehensive (loss) income:			
Change in foreign currency translation adjustment	(6.4)	10.5	0.3
Change in unrecognized net actuarial loss and prior service cost related to pension benefit plans, net of income tax (benefit) expense of $(0.6), $1.3 and $(2.1), respectively	(3.7)	3.6	(3.4)
Change in unrealized net gain on derivatives, net of income tax expense (benefit) of $0.1, $0.6 and $(0.1), respectively	0.3	1.0	(0.1)
Total other comprehensive (loss) income	(9.8)	15.1	(3.2)
Comprehensive income	$84.2	$76.7	$40.6

See notes to consolidated financial statements.

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FEDERAL SIGNAL CORPORATION AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS

(in millions, except per share data)	As of December 31, 2018	2017
ASSETS		
Current assets:		
Cash and cash equivalents	$37.4	$37.5
Accounts receivable, net of allowances for doubtful accounts of $1.6 and $1.1, respectively	124.4	118.2
Inventories	157.3	137.2
Prepaid expenses and other current assets	9.4	10.9
Total current assets	328.5	303.8
Properties and equipment, net	62.0	60.1
Rental equipment, net	96.6	87.2
Goodwill	375.1	377.3
Intangible assets, net	143.1	151.8
Deferred tax assets	12.5	6.2
Deferred charges and other long-term assets	5.6	5.4
Long-term assets of discontinued operations	0.4	0.5
Total assets	$1,023.8	$992.3
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Current portion of long-term borrowings and capital lease obligations	$0.2	$0.3
Accounts payable	66.1	51.5
Customer deposits	10.1	6.5
Accrued liabilities:		
Compensation and withholding taxes	29.5	22.2
Other current liabilities	52.7	36.1
Current liabilities of discontinued operations	0.2	0.5
Total current liabilities	158.8	117.1
Long-term borrowings and capital lease obligations	209.9	277.4
Long-term pension and other post-retirement benefit liabilities	54.6	56.6
Deferred gain	6.8	8.7
Deferred tax liabilities	46.3	45.4
Other long-term liabilities	15.9	28.2
Long-term liabilities of discontinued operations	1.4	1.5
Total liabilities	493.7	534.9
Stockholders' equity:		
Common stock, $1 par value per share, 90.0 shares authorized, 66.4 and 66.1 shares issued, respectively	66.4	66.1
Capital in excess of par value	217.0	207.7
Retained earnings	432.5	346.6
Treasury stock, at cost, 6.2 and 6.1 shares, respectively	(88.5)	(86.1)
Accumulated other comprehensive loss	(97.3)	(76.9)
Total stockholders' equity	530.1	457.4
Total liabilities and stockholders' equity	$1,023.8	$992.3

See notes to consolidated financial statements.

FEDERAL SIGNAL CORPORATION AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS

	For the Years Ended December 31,		
(in millions)	2018	2017	2016
Operating activities:			
Net income	$94.0	$61.6	$43.8
Adjustments to reconcile net income to net cash provided by operating activities:			
Net gain on discontinued operations and disposal	(0.3)	(1.1)	(4.4)
Depreciation and amortization	36.4	30.0	19.1
Deferred financing costs	0.4	0.3	0.6
Deferred gain	(1.9)	(2.0)	(1.9)
Stock-based compensation expense	7.6	4.6	4.8
Pension settlement charges	—	6.1	—
Pension expense, net of funding	(7.8)	(5.2)	(3.7)
Changes in fair value of contingent consideration and deferred payment	1.1	1.0	0.5
Deferred income taxes, including change in valuation allowance	(5.6)	(14.9)	7.9
Changes in operating assets and liabilities, net of effects of discontinued operations:			
Accounts receivable	(7.9)	(11.1)	(8.0)
Inventories	(22.6)	9.4	(2.3)
Rental equipment	(30.6)	(15.7)	(6.9)
Prepaid expenses and other current assets	(1.0)	3.9	1.6
Accounts payable	15.6	(5.2)	(13.9)
Customer deposits	3.7	1.5	—
Accrued liabilities	8.2	8.0	(7.4)
Income taxes	2.2	1.6	(4.4)
Other	1.3	0.7	1.3
Net cash provided by continuing operating activities	92.8	73.5	26.7
Net cash used for discontinued operating activities	—	(0.7)	(2.0)
Net cash provided by operating activities	92.8	72.8	24.7
Investing activities:			
Purchases of properties and equipment	(14.1)	(8.0)	(6.1)
Proceeds from (payments for) acquisitions, net of cash acquired	3.0	(269.2)	(102.6)
Cash collected from customer	—	—	6.0
Other, net	0.1	0.1	(0.3)
Net cash used for continuing investing activities	(11.0)	(277.1)	(103.0)
Net cash (used for) provided by discontinued investing activities	—	(1.1)	86.2
Net cash used for investing activities	(11.0)	(278.2)	(16.8)
Financing activities:			
(Decrease) increase in revolving lines of credit, net	(62.1)	209.1	64.8
Payments on long-term borrowings	—	—	(43.4)
Payments of debt financing fees	—	(0.2)	(1.1)
Purchases of treasury stock	(1.2)	—	(37.8)
Redemptions of common stock to satisfy withholding taxes related to stock-based compensation	(0.5)	(2.9)	(2.7)
Cash dividends paid to stockholders	(18.7)	(16.8)	(16.9)
Proceeds from stock compensation activity	1.3	1.6	0.5

Other, net	—	(0.1)	(0.5)
Net cash (used for) provided by continuing financing activities	(81.2)	190.7	(37.1)
Net cash provided by discontinued financing activities	—	—	0.7
Net cash (used for) provided by financing activities	(81.2)	190.7	(36.4)
Effects of foreign exchange rate changes on cash and cash equivalents	(0.7)	1.5	(1.8)
(Decrease) increase in cash and cash equivalents	(0.1)	(13.2)	(30.3)
Cash and cash equivalents at beginning of year	37.5	50.7	81.0
Cash and cash equivalents at end of year	$37.4	$37.5	$50.7

See notes to consolidated financial statements.

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FEDERAL SIGNAL CORPORATION AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

(in millions, except per share data)	Common Stock Par Value	Capital in Excess of Par Value	Retained Earnings	Treasury Stock	Accumulated Other Comprehensive Loss	Total
Balance at January 1, 2016	$ 64.8	$ 195.6	$ 274.9	$ (40.9)	$ (88.8)	$ 405.6
Net income			43.8			43.8
Total other comprehensive loss					(3.2)	(3.2)
Cash dividends declared ($0.28 per share)			(16.9)			(16.9)
Stock-based payments:						
Stock-based compensation		4.3				4.3
Stock option exercises and other	0.2	0.8		(0.3)		0.7
Performance share unit transactions	0.4	(0.4)		(2.4)		(2.4)
Stock repurchase program				(37.8)		(37.8)
Balance at December 31, 2016	65.4	200.3	301.8	(81.4)	(92.0)	394.1
Net income			61.6			61.6
Total other comprehensive income					15.1	15.1
Cash dividends declared ($0.28 per share)			(16.8)			(16.8)
Stock-based payments:						
Stock-based compensation		4.0				4.0
Stock option exercises and other	0.5	3.6		(2.8)		1.3
Performance share unit transactions	0.2	(0.2)		(1.9)		(1.9)
Balance at December 31, 2017	66.1	207.7	346.6	(86.1)	(76.9)	457.4
Net income			94.0			94.0
Total other comprehensive loss					(9.8)	(9.8)
Cash dividends declared ($0.31 per share)			(18.7)			(18.7)
Impact of adoption of ASU 2018-02			10.6		(10.6)	—
Stock-based payments:						
Stock-based compensation		7.0				7.0
Stock option exercises and other	0.3	2.3		(1.2)		1.4
Stock repurchase program				(1.2)		(1.2)
Balance at December 31, 2018	$ 66.4	$ 217.0	$ 432.5	$ (88.5)	$ (97.3)	$ 530.1

See notes to consolidated financial statements.

FEDERAL SIGNAL CORPORATION AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
NOTE 1 — SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES
Organization and Description of the Business
Federal Signal Corporation was founded in 1901 and was reincorporated as a Delaware corporation in 1969. References herein to the "Company," "we," "our" or "us" refer collectively to Federal Signal Corporation and its subsidiaries. Products manufactured and services rendered by the Company are divided into two reportable segments: Environmental Solutions Group and Safety and Security Systems Group. The individual operating businesses are organized as such because they share certain characteristics, including technology, marketing, distribution and product application, which create long-term synergies.
Our fiscal year ends on December 31. All references to 2018, 2017 and 2016 relate to the fiscal year unless otherwise indicated.
Basis of Presentation and Consolidation
The accompanying consolidated financial statements represent the consolidation of Federal Signal Corporation and its subsidiaries and have been prepared by the Company pursuant to the rules and regulations of the Securities and Exchange Commission ("SEC") and in accordance with United States ("U.S.") generally accepted accounting principles ("GAAP").
Intercompany balances and transactions have been eliminated in consolidation. In addition, certain prior year amounts have been reclassified to conform to current year presentation.
New Accounting Standards Adopted in 2018
In May 2014, the Financial Accounting Standards Board (the "FASB") issued Accounting Standards Update ("ASU") No. 2014-09, Revenue from Contracts with Customers ("Topic 606"), which supersedes the revenue recognition requirements in Accounting Standards Codification ("ASC") 605, Revenue Recognition. Topic 606 is based on the principle that revenue is recognized to depict the transfer of goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. Topic 606 also requires additional disclosure about the nature, amount, timing and uncertainty of revenue and cash flows arising from customer contracts, including significant judgments and changes in judgments, and assets recognized from costs incurred to obtain or fulfill a contract. The Company adopted this guidance on January 1, 2018 using the modified retrospective transition method. See Note 2 – Revenue Recognition for further details.
In August 2016, the FASB issued ASU No. 2016-15, Statement of Cash Flows (Topic 230), Classification of Certain Cash Receipts and Payments, which provides additional guidance on the financial statement presentation of certain activities in the statement of cash flows. The activities addressed by this guidance that may be relevant to the Company include cash payments for debt prepayment or debt extinguishment costs, contingent consideration payments made after a business combination, proceeds from the settlement of insurance claims and proceeds from the settlement of corporate-owned life insurance policies, and the application of the predominance principle. The amendments in this ASU are effective for fiscal years beginning after December 15, 2017 and interim periods within those fiscal years. The amendments in this ASU should be applied using a retrospective transition method to each period presented. If it is impracticable to apply the amendments retrospectively for some of the issues, the amendments for those issues would be applied prospectively as of the earliest date practicable. The Company adopted this guidance on January 1, 2018 and concluded that it did not have a material impact on its historical cash flow presentation.
In October 2016, the FASB issued ASU No. 2016-16, Income Taxes (Topic 740), Intra-Entity Transfers of Assets Other Than Inventory. This guidance requires the income tax consequences of an intra-entity transfer of an asset other than inventory to be recognized when the transfer occurs, instead of when the asset is sold to an outside party. The pronouncement is effective for annual reporting periods beginning after December 15, 2017, including interim reporting periods within those annual reporting periods, with early adoption permitted. The amendments in this ASU should be applied on a modified retrospective basis, with an adjustment reflecting the cumulative effect of adoption

being recorded directly to retained earnings as of the beginning of the period of adoption. The Company adopted this guidance on January 1, 2018 and concluded that it did not have a material impact on its consolidated financial statements.

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FEDERAL SIGNAL CORPORATION AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS — (CONTINUED)

In January 2017, the FASB issued ASU No. 2017-04, Intangibles – Goodwill and Other (Topic 350), Simplifying the Test for Goodwill Impairment, which eliminates the second step of the two-step quantitative approach for testing goodwill for potential impairment. An entity will therefore perform the goodwill impairment test by comparing the fair value of a reporting unit with its carrying amount, and recognize an impairment charge for the amount by which the carrying amount exceeds the fair value, not to exceed the total amount of goodwill allocated to the reporting unit. An entity still has the option to perform a qualitative assessment to determine if the quantitative impairment test is necessary. ASU 2017-04 is effective for fiscal years beginning after December 15, 2019 on a prospective basis, with early adoption permitted. The Company elected to early adopt this guidance on January 1, 2018, and applied it to its goodwill impairment testing in 2018.

In March 2017, the FASB issued ASU No. 2017-07, Compensation – Retirement Benefits (Topic 715), Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost. This guidance requires that entities present the service cost component of net periodic pension expense in the same income statement line items as other employee compensation costs. All other components of net periodic pension cost should be reported separately from the service cost component and outside a subtotal of operating income. The Company adopted this guidance effective January 1, 2018 following the retrospective method of adoption. The Consolidated Statements of Operations presented herein have been recast to present components of net periodic pension expense, other than service cost, as a component of Other expense (income), net or Pension settlement charges, as applicable.

The following table summarizes the impact of ASU 2017-07 on the Company's previously reported Consolidated Statements of Operations:

	For the Year Ended December 31, 2017			For the Year Ended December 31, 2016
(in millions)	As Reported	Impact of Adoption	As Adjusted	As Reported