Intelsat S.A.
Form 20-F
February 20, 2019

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

FORM 20-F
(Mark One)
REGISTRATION STATEMENT PURSUANT TO SECTION 12(b) OR 12(g) OF THE SECURITIES EXCHANGE ACT OF 1934
OR
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
OR
SHELL COMPANY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
Commission file number: 001-35878
INTELSAT S.A.
(Exact name of Registrant as specified in its charter)
N/A
(Translation of Registrant’s name into English)
Grand Duchy of Luxembourg
(Jurisdiction of incorporation or organization)
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Luxembourg
Grand-Duchy of Luxembourg
L-1246
(Address of principal executive offices)
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(Name, Telephone, E-Mail and/or Facsimile number and Address of Company Contact Person)

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

Title of Each Class	Name of Each Exchange On Which Registered
Common Shares, nominal value $0.01 per share	New York Stock Exchange

Securities registered or to be registered pursuant to Section 12(g) of the Act:
None
Securities for which there is a reporting obligation pursuant to Section 15(d) of the Act:
None
Indicate the number of outstanding shares of each of the issuer's classes of capital or common stock as of the close of the period covered by the Annual Report.
138,018,894 common shares, nominal value $0.01 per share
Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes No
If this report is an annual or transition report, indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934. Yes No
Note—checking the box above will not relieve any registrant required to file reports pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 from their obligations under those Sections.
Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No
Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit files). Yes No
Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or an emerging growth company. See definition of "large accelerated filer," "accelerated filer," and "emerging growth company" in Rule 12b-2 of the Exchange Act.
Large accelerated filer Accelerated Filer

Non-accelerated filer Emerging growth company
If an emerging growth company that prepares its financial statements in accordance with U.S. GAAP, 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.

* The term "new or revised financial accounting standard" refers to any update issued by the Financial Accounting Standards Board to its Accounting Standards Codification after April 5, 2012.

Indicate by check mark which basis of accounting the registrant has used to prepare the financial statements included in this filing:

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U.S. GAAP | International Financial Reporting Standards as issued by the International Accounting Standards Board | Other

If “Other” has been checked in response to the previous question indicate by check mark which financial statement item the registrant has elected to follow. Item 17 Item 18

If this is an annual report, indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes No

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FORWARD-LOOKING STATEMENTS

Some of the statements in this Annual Report on Form 20-F, or Annual Report, and oral statements made from time to time by our representatives constitute forward-looking statements that do not directly or exclusively relate to historical facts. The Private Securities Litigation Reform Act of 1995 provides a “safe harbor” for certain forward-looking statements as long as they are identified as forward-looking and are accompanied by meaningful cautionary statements identifying important factors that could cause actual results to differ materially from the expectations expressed or implied in the forward-looking statements.

When used in this Annual Report, the words “may,” “will,” “ might,” “should,” “expect,” “plan,” “anticipate,” “project,” “belie “estimate,” “predict,” “intend,” “potential,” “outlook” and “continue,” and the negative of these terms, and other similar expressions are intended to identify forward-looking statements and information. Examples of these forward-looking statements include, but are not limited to, statements regarding the following: our belief that the growing worldwide demand for reliable broadband connectivity everywhere at all times, together with our leadership position in our attractive sector, global scale, efficient operating and financial profile, diversified customer sets and sizeable contracted backlog, provide us with a platform for long-term success; our belief that the new and differentiated capacity of our next generation Intelsat Epic^{NG} satellites will provide inventory to help offset recent trends of pricing pressure in our network services business; our outlook that the increased volume of services provided by our Intelsat Epic^{NG} fleet is expected to stabilize business activity in the network services sector; our expectation that over time incremental demand for capacity to support the new 4K format, also known as ultra-high definition, could compensate for reductions in demand related to use of new compression technologies in our media business; our expectation that our investment in a new generation of ground hardware will simplify access to satellite communications, potentially opening much larger and faster growing sectors than those traditionally served by our industry; our belief that employing a disciplined yield management approach, and focusing our marketing and distribution strategies around our four primary customer sets will drive stability in our core business; our expectation that designing and deploying differentiated managed service offerings in targeted verticals, leveraging the scale, higher performance and better economics of our Intelsat Epic^{NG} fleet will drive revenue growth; innovate through targeted investments and partnerships to develop a standards-based ecosystem that will provide seamless interface with low earth orbit technologies and the broader telecommunications ecosystem; our ability to efficiently incorporate new technologies into our network to capture growth; our intention to maximize our revenues and returns generated by our assets by developing and managing our capacity in a disciplined and efficient manner; our projection that our government business will benefit from the increasing demands for mobility services from the U.S. government for aeronautical and ground mobile requirements; our intention to leverage our satellite launches and maximize the value of our spectrum rights, including the pursuit of partnerships to optimize new satellite business cases and the exploration of joint-use of certain spectrum with the wireless sector in certain geographies; our expectations as to the potential timing of a final U.S. Federal Communications Commission ("FCC") ruling with respect to our C-band joint-use proposal; our intent to consider select acquisitions of complementary businesses or technologies that enhance our product and geographic portfolio; our belief that developing differentiated services and investing in new technology will allow us to unlock opportunities that are essential, but have been slow to develop due to cost and/or technology challenges; the trends that we believe will impact our revenue and operating expenses in the future; our assessments regarding how long satellites that have experienced anomalies in the past should be able to provide service on their transponders; our assessment of the risks of future anomalies occurring on our satellites; our plans for satellite launches in the near-term; our expected capital expenditures in 2019 and during the next several years; our belief that the diversity of our revenue and customer base allows us to recognize trends, capture new growth opportunities, and gain experience that can be transferred to customers in other regions; our belief that the scale of our fleet can reduce the financial impact of any satellite or launch failures and protect against service interruption; and the impact on our financial position or results of operations of pending legal proceedings.

Forward-looking statements reflect our intentions, plans, expectations, anticipations, projections, estimations, predictions, outlook, assumptions and beliefs about future events. These forward-looking statements speak only as of

their dates and are not guarantees of future performance or results and are subject to risks, uncertainties and other factors, many of which are outside of our control. These factors could cause actual results or developments to differ materially from the expectations expressed or implied in the forward-looking statements and include known and unknown risks. Known risks include, among others, the risks discussed in Item 3D—Risk Factors, the political, economic and legal conditions in the markets we are targeting for communications services or in which we operate and other risks and uncertainties inherent in the telecommunications business in general and the satellite communications business in particular.

Other factors that may cause results or developments to differ materially from historical results or developments or the forward-looking statements made in this Annual Report include, but are not limited to:

- risks associated with operating our in-orbit satellites;
- satellite launch failures, satellite launch and construction delays and in-orbit failures or reduced satellite performance;

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- potential changes in the number of companies offering commercial satellite launch services and the number of commercial satellite launch opportunities available in any given time period that could impact our ability to timely schedule future launches and the prices we pay for such launches;
- our ability to obtain new satellite insurance policies with financially viable insurance carriers on commercially reasonable terms or at all, as well as the ability of our insurance carriers to fulfill their obligations;
- possible future losses on satellites that are not adequately covered by insurance;
- U.S. and other government regulation;
- changes in our contracted backlog or expected contracted backlog for future services;
- pricing pressure and overcapacity in the markets in which we compete;
- our ability to access capital markets for debt or equity;
- the competitive environment in which we operate;
- customer defaults on their obligations to us;
- our international operations and other uncertainties associated with doing business internationally;
- litigation; and
- other risks discussed under Item 3D—Risk Factors.

Although we believe that the expectations reflected in the forward-looking statements are reasonable, we cannot guarantee our future results, level of activity, performance or achievements. Because actual results could differ materially from our intentions, plans, expectations, anticipations, projections, estimations, predictions, outlook, assumptions and beliefs about the future, you are urged not to rely on forward-looking statements in this Annual Report and to view all forward-looking statements made in this Annual Report with caution. We do not undertake any obligation to update or revise any forward-looking statements, whether as a result of new information, future events or otherwise.

INDUSTRY AND MARKET DATA

This Annual Report includes information with respect to regional and sector share and industry conditions from third-party sources, public filings and based upon our estimates using such sources when available. While we believe that such information and estimates are reasonable and reliable, we have not independently verified the data from third-party sources, including Euroconsult Satellite Communications & Broadcasting Markets Survey, 25th Edition (September 2018), Euroconsult Prospects for In-Flight Entertainment and Connectivity, 6th Edition (June 2018), Euroconsult Prospects for Maritime Satellite Communications, 6th Edition (March 2018), NSR Government & Military Satellite Communications, 15th Edition (October 2018), NSR Global Satellite Capacity Supply & Demand, 15th Edition (July 2018), NSR Wireless Backhaul via Satellite, 12th Edition (April 2018), NSR VSAT and Broadband Satellite Markets, 17th edition (December 2018), NSR VSAT and Broadband Satellite Markets, 16th edition (November 2017), NSR Aeronautical Satcom Market, 6th Edition (June 2018), NSR M2M and IoT via Satellite, 9th Edition (September 2018), NSR Maritime Services Markets, 6th edition (July 2018), the World Bank Group, Seradata Spacetrak, Valour Consltancy In-Flight Connectivity Update Q3 2018 (November 2018), Boeing Commercial Market Outlook (2017), and GSMA Intelligence. Unless otherwise specified, all references contained in this Annual Report to these third-party sources are as of the dates of these sources stated above. Similarly, our internal research is based upon our understanding of industry conditions, and such information has not been verified by independent sources. Specifically, when we refer to the relative size, regions served, number of customers contracted, experience and financial performance of our business as compared to other companies in our sector, our assertions are based upon public filings of other operators and comparisons provided by third-party sources, as outlined above.

Throughout this Annual Report, unless otherwise indicated, references to market positions are based on third-party market research. If a regional position or statement as to industry conditions is based on internal research, it is identified as management's belief. Throughout this Annual Report, unless otherwise indicated, statements as to our relative positions as a provider of services to customers and regions are based upon our relative share. For additional information regarding our regional share with respect to our customer sets, services and regions, and the bases upon

which we determine our share, see Item 4B—Business Overview.

PART I

Item 1. Identity of Directors, Senior Management and Advisers
Not applicable.

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Item 2. Offer Statistics and Expected Timetable

Not applicable.

Item 3. Key Information

In this Annual Report unless otherwise indicated or the context otherwise requires, (1) the terms “we,” “us,” “our,” “the Company” and “Intelsat” refer to Intelsat S.A., and its subsidiaries on a consolidated basis, (2) the term “Intelsat Holdings” refers to our indirect subsidiary, Intelsat Holdings S.A., (3) the term “Intelsat Investments” refers to Intelsat Investments S.A., Intelsat Holdings’ direct wholly-owned subsidiary, (4) the term “Intelsat Luxembourg” refers to Intelsat (Luxembourg) S.A., Intelsat Investments’ direct wholly-owned subsidiary, (5) the term "Intelsat Envision" refers to Intelsat Envision Holdings LLC, Intelsat Luxembourg's direct wholly-owned subsidiary, (6) the terms “Intelsat Connect” and “ICF” refer to Intelsat Connect Finance S.A., Intelsat Envision’s direct wholly-owned subsidiary, (7) the term “Intelsat Jackson” refers to Intelsat Jackson Holdings S.A., Intelsat Connect’s direct wholly-owned subsidiary, and (8) the term “Intelsat” refers to specific Intelsat-satellites. We refer to Intelsat General Communications LLC, one of our subsidiaries, as “Intelsat General.” In this Annual Report, unless the context otherwise requires, all references to transponder capacity or demand refer to transponder capacity or demand in the C-band and Ku-band only.

A. Selected Financial Data

The following selected historical consolidated financial data should be read in conjunction with, and is qualified by reference to, Item 5—Operating and Financial Review and Prospects and our audited consolidated financial statements and their notes included elsewhere in this Annual Report. The consolidated statement of operations data and consolidated cash flow data for the years ended December 31, 2016, 2017 and 2018, and the consolidated balance sheet data as of December 31, 2017 and 2018 have been derived from audited consolidated financial statements included elsewhere in this Annual Report. The consolidated statement of operations data and consolidated cash flow data for the years ended December 31, 2014 and 2015 and the consolidated balance sheet data as of December 31, 2014, 2015 and 2016, have been derived from audited consolidated financial statements that are not included in this Annual Report.

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	Year Ended December 31,				
	2014	2015	2016 [1]	2017 [1]	2018 [2]
	(in thousands, except per share amounts)				
Consolidated Statement of Operations Data					
Revenue	$2,472,386	$2,352,521	$2,188,047	$2,148,612	$2,161,190
Operating expenses:					
Direct costs of revenue (excluding depreciation and amortization)	348,348	328,501	342,634	324,232	330,874
Selling, general and administrative	197,407	199,412	232,537	205,475	200,857
Impairment of goodwill and other intangibles	—	4,165,400	—	—	—
Depreciation and amortization	679,351	687,729	694,891	707,824	687,589
Gain on satellite insurance recoveries	—	—	—	—	—
Total operating expenses	1,225,106	5,381,042	1,270,062	1,237,531	1,219,320
Income (loss) from operations	1,247,280	(3,028,521)	917,985	911,081	941,870
Interest expense, net	944,787	890,279	938,501	1,020,770	1,212,374
Gain (loss) on early extinguishment of debt	(40,423)	7,061	1,030,092	(4,109)	(199,658)
Other income (expense), net	(2,593)	(6,201)	522	10,114	4,541
Income (loss) before income taxes	259,477	(3,917,940)	1,010,098	(103,684)	(465,621)
Provision for (benefit from) income taxes	22,971	1,513	15,986	71,130	130,069
Net income (loss)	236,506	(3,919,453)	994,112	(174,814)	(595,690)
Net income attributable to noncontrolling interest	(3,974)	(3,934)	(3,915)	(3,914)	(3,915)
Net income (loss) attributable to Intelsat S.A.	232,532	(3,923,387)	990,197	(178,728)	(599,605)
Cumulative preferred dividends	(9,917)	(9,919)	—	—	—
Net income (loss) attributable to common shareholders	$222,615	$(3,933,306)	$990,197	$(178,728)	$(599,605)
Other Data					
Capital expenditures	$645,424	$724,362	$714,570	$461,627	$255,696
Other payments for satellites	$—	$—	$18,333	$35,396	$—
Basic income (loss) per common share attributable to Intelsat S.A.	$2.09	$(36.68)	$8.65	$(1.50)	$(4.63)
Diluted income (loss) per common share attributable to Intelsat S.A.	$1.99	$(36.68)	$8.36	$(1.50)	$(4.63)
Basic weighted average shares outstanding (in millions)	106.5	107.2	114.5	118.9	129.6
Diluted weighted average shares outstanding (in millions)	116.6	107.2	118.5	118.9	129.6
Dividends declared per 5.75% series A mandatory convertible junior non-voting preferred share	$2.87	$2.88	$—	$—	$—
Consolidated Cash Flow Data[3]					
Net cash provided by operating activities	$1,046,170	$910,031	$678,755	$464,246	$344,173
Net cash used in investing activities	(645,250)	(749,354)	(730,589)	(468,297)	(283,634)
Net cash provided by (used in) financing activities	(519,003)	(102,986)	546,347	(121,698)	(90,323)
Consolidated Balance Sheet Data					
Cash and cash equivalents, net of restricted cash[3]	$123,147	$171,541	$666,024	$525,215	$485,120
Restricted cash[3]	—	—	—	16,176	22,037
Satellites and other property and equipment, net	5,880,264	5,998,317	6,185,842	5,923,619	5,511,702
Total assets	16,326,434	12,253,590	12,942,009	12,610,036	12,241,513

Total debt	14,668,221	14,611,379	14,198,084	14,208,658	14,028,352
Shareholders' deficit	(776,268)	(4,649,565)	(3,634,145)	(3,807,870)	(4,097,005)
Net assets	(742,567)	(4,620,353)	(3,609,998)	(3,788,564)	(4,082,609)
Number of common shares (in millions)	106.7	107.6	118.0	119.6	138.0
Number of 5.75% series A mandatory convertible junior non-voting preferred shares (in millions)	3.5	3.5	—	—	—

(1) We adopted Accounting Standard Update ("ASU") 2017-07, Compensation-Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost, on January 1, 2018 using the retrospective method. As a result, the company reclassified a net credit for pension and postretirement benefits from operating expenses to other income for the years ended December 31, 2017 and 2016, to conform to the current year presentation. Years prior to 2016 do not reflect the effects from our January 1, 2018, adoption of ASC Topic 715.

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(2) We adopted ASU 2014-09, Revenue from Contracts with Customers (Topic 606) ("ASC 606"), effective January 1, 2018, using the modified retrospective method. Years prior to 2018 do not reflect the effects from our January 1, 2018, adoption of ASC 606.

(3) We adopted ASU 2016-15, Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments and ASU 2016-18, Statement of Cash Flows (Topic 230): Restricted Cash on January 1, 2018 using the retrospective method. Balance sheets prior to 2017 and statements of cash flows prior to 2016 have not been restated.

B. Capitalization and Indebtedness

Not applicable.

C. Reasons for the Offer and Use of Proceeds

Not applicable.

D. Risk Factors

The risks described below are not the only ones that we may face. Additional risks that are not currently known to us or that we currently consider immaterial may also impair our business, financial condition or results of operations.

Risk Factors Relating to Our Business

We are subject to significant competition from within the fixed satellite services (“FSS”) sector, from alternative satellite service providers and from other providers of communications capacity, such as fiber optic cable capacity. Competition from other telecommunications providers could have a material adverse effect on our business and could prevent us from implementing our business strategy and expanding our operations as planned.

We face significant competition in the FSS sector in different regions around the world. We compete against other satellite operators and against suppliers of ground-based communications capacity. The increasing availability of satellite capacity and capacity from other forms of communications technology has historically created an excess supply of telecommunications capacity in certain regions from time to time. We believe such an imbalance could again occur in certain regions, particularly as we and other operators begin to introduce next generation high-throughput satellite technology to our fleets. Additionally, there is emerging interest from new entrants to launch new constellations in different orbits that could potentially compete with portions of our business. Increased competition in the FSS sector could lower prices, which could reduce our operating margins and the cash available to fund our operations and service our debt obligations. In addition, there has been a trend toward consolidation of major FSS providers as customers increasingly demand more robust distribution platforms with network redundancies and worldwide reach, and we expect to face increased competition as a result of this trend. Our direct competitors are likely to continue developing and launching satellites with greater power and more transponders, which may create satellite capacity at lower costs. In order to compete effectively, we invest in similar technology.

We also believe that there are many companies that are seeking ways to improve the ability of existing land-based infrastructure, such as fiber optic cable, to transmit signals. Any significant improvement or increase in the amount of land-based capacity, particularly with respect to the existing fiber optic cable infrastructure and point-to-point applications, may cause our video and network services customers to shift their transmissions to land-based capacity or make it more difficult for us to obtain new customers. If fiber optic cable networks or other ground-based high-capacity transmission systems are available to service a particular point, that capacity, when available, is generally less expensive than satellite capacity. As land-based telecommunications services expand, demand for some satellite-based services may be reduced.

In addition, we face challenges to our business apart from these industry trends that our competition may not face. A portion of our revenue has historically been derived from channel services, and from other point-to-point services which comprise a portion of our transponder services. Because fiber optic cable capacity is generally available at lower prices than satellite capacity, competition from fiber optic cable providers has historically caused a migration of our point-to-point customers from satellite to fiber optic cable on certain routes, resulting in erosion in our revenue from point-to-point services over the last ten years. Some other FSS operators have service mixes that are less

weighted towards point-to-point connectivity than our current service mix. We have been addressing this erosion and sustaining our business by expanding our customer base in point-to-multipoint services, such as video, and growing our presence in serving wireless communications providers and the mobility sector.

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Failure to compete effectively with other FSS operators and to adapt to new competition and new technologies or failure to implement our business strategy while maintaining our existing business could result in a loss of revenue and a decline in profitability, a decrease in the value of our business and a downgrade of our credit ratings, which could restrict our access to the capital markets.

The market for FSS may not grow or may shrink, and therefore we may not be able to attract new customers, retain our existing customers or implement our strategies to grow our business. In addition, pricing pressures may have an adverse impact on FSS sector revenue.

The FSS sector, as a whole, has experienced growth over the past few years. However, the future market for FSS may not grow or may shrink. Competing technologies, such as fiber optic cable, continue to adversely affect the point-to-point segment of the FSS sector. In the point-to-multipoint segment, economic downturns, the transition of video traffic from analog to digital and continuing improvements in compression technology, which allow for improved transmission efficiency, have negatively impacted demand for certain fixed satellite services. Developments that we expect to support the growth of the satellite services industry, such as continued growth in data traffic and the proliferation of direct-to-home ("DTH") platforms, high definition television ("HDTV") and niche programming, may fail to materialize or may not occur in the manner or to the extent we anticipate. Any of these industry dynamics could negatively affect our operations and financial condition.

Because the market for FSS may not grow or may shrink, we may not be able to attract customers for the services that we are providing as part of our strategy to sustain and grow our business. Reduced growth in the FSS sector may also adversely affect our ability to retain our existing customers. A shrinking market could reduce the number and value of our customer contracts and would have a material adverse effect on our business and results of operations. In addition, there could be a substantial negative impact on our credit ratings and our ability to access the capital markets.

The FSS sector has in the past experienced periods of pricing pressures that have resulted in reduced revenues of FSS operators. Current pricing pressures and potential pricing pressures in the future could have a significant negative impact on our revenues and financial condition.

We have a substantial amount of indebtedness, which may adversely affect our cash flow and our ability to operate our business, remain in compliance with debt covenants and make payments on our indebtedness.

As of December 31, 2018, on a consolidated basis, we had approximately $14.3 billion principal amount of third-party indebtedness outstanding, approximately $4.9 billion of which was secured debt. Our subsidiaries were the issuers or borrowers of portions of this debt as follows: (a) Intelsat (Luxembourg) S.A. ("Intelsat Luxembourg"), had approximately $13.9 billion principal amount of total third-party indebtedness outstanding on a consolidated basis, approximately $4.9 billion of which was secured debt, (b) Intelsat Connect Finance S.A. ("ICF"), had approximately $1.25 billion principal amount of total third-party indebtedness outstanding on a stand-alone basis, and (c) Intelsat Jackson Holdings S.A. ("Intelsat Jackson"), had approximately $11.4 billion principal amount of total third-party indebtedness outstanding on a consolidated basis, approximately $4.9 billion of which was secured debt. Intelsat Luxembourg debt, ICF debt and Intelsat Jackson debt are included in our consolidated debt.

The indentures and credit agreements governing a substantial portion of the outstanding debt of Intelsat Luxembourg, ICF and Intelsat Jackson and their respective subsidiaries permit each of these companies to make payments to their respective direct and indirect parent companies to fund the cash interest payments on such indebtedness, so long as no default or event of default shall have occurred and be continuing or would occur as a consequence thereof.

Our substantial indebtedness could have important consequences. For example, it could:

- make it more difficult for us to satisfy obligations with respect to indebtedness, and any failure to comply with the obligations of any of our debt instruments, including financial and other restrictive covenants, could result in an event of default under the indentures governing our notes and the agreements governing such other indebtedness;
- require us to dedicate a substantial portion of available cash flow to pay principal and interest on our outstanding debt, which will reduce the funds available for working capital, capital expenditures, acquisitions and other general

corporate purposes;

- limit flexibility in planning for and reacting to changes in our business and in the industry in which we operate;
- increase our vulnerability to general adverse economic and industry conditions and to deterioration in operating results;
- limit our ability to engage in strategic transactions or implement our business strategies;
- limit our ability to borrow additional funds, or to refinance, repay or restructure our existing indebtedness; and
- place us at a disadvantage compared to any competitors that have less debt.

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Any of the factors listed above could materially and adversely affect our business and our results of operations. Furthermore, our interest expense could increase if interest rates rise because certain portions of our debt bear interest at floating rates. Although we have hedged the full amount of our floating rate debt of $2.4 billion for the upcoming two years for increases in the 1-month London InterBank Offered Rate ("LIBOR") to a rate above 1.89%, any increases in 1-month LIBOR from current levels to 1.89% would cause our interest expense to increase. Our interest expense could also increase when we refinance debt. If we do not have sufficient cash flow to service our debt, we may be required to refinance all or part of our existing debt, sell assets, borrow more money or sell securities, none of which we can guarantee we will be able to do.

We may be able to incur significant additional indebtedness in the future. Although the agreements governing our indebtedness contain restrictions on the incurrence of certain additional indebtedness, these restrictions are subject to a number of important qualifications and exceptions, and the indebtedness incurred in compliance with these restrictions could be substantial. If we incur new indebtedness, the related risks, including those described above, could intensify.

To service our third-party indebtedness, we will require a significant amount of cash. Our ability to generate cash depends on many factors beyond our control, and any failure to meet our third-party debt service obligations could harm our business, financial condition and results of operations.

Our estimated payment obligations with respect to third-party indebtedness (i.e., not held by ICF or any of our other subsidiaries) for 2019 comprise approximately $1.1 billion of interest payments, excluding payments related to satellite performance incentives due to satellite manufacturers. Of this amount, $864 million is attributable to Intelsat Jackson, $105 million is attributable to Intelsat Luxembourg, $119 million is attributable to ICF, and $18 million is attributable to Intelsat S.A.

Our ability to satisfy our debt obligations will depend principally upon our future operating performance. As a result, prevailing economic conditions and financial, business and other factors, many of which are beyond our control, will affect our ability to make payments on our indebtedness. If we do not generate sufficient cash flow from operations to satisfy our debt service obligations, or if our subsidiaries are prohibited from paying dividends or making distributions because of restrictions in the agreements governing their indebtedness or otherwise, we may have to pursue alternative financing plans, such as refinancing or restructuring our indebtedness, selling assets, reducing or delaying capital investments or seeking to raise additional capital. Our ability to refinance or restructure our debt will depend on the capital markets and our financial condition at such time. Any refinancing of our debt could be at higher interest rates and may require us to comply with more onerous covenants, which could further restrict our business operations. In addition, the terms of our and our subsidiaries' existing or future debt instruments, including the Intelsat Jackson Secured Credit Agreement and the indentures governing Intelsat S.A.'s, Intelsat Luxembourg's, Intelsat Jackson's and ICF's outstanding notes, may restrict us from adopting some of these alternatives. Furthermore, the Sponsor (as defined below in Item 4A—History and Development of the Company—The Sponsors Acquisition Transactions) has no obligation to provide us with debt or equity financing in the future. Our inability to generate sufficient cash flow to satisfy our debt service obligations, or to refinance our obligations on commercially reasonable terms would have an adverse effect, which could be material, on our business, financial position, results of operations and cash flows.

The terms of the Intelsat Jackson Secured Credit Agreement, the indentures governing our existing notes and the terms of our other indebtedness may restrict our current and future operations, particularly our ability to respond to changes in our business or to take certain actions.

On January 12, 2011, Intelsat Jackson, our wholly-owned subsidiary, entered into a secured credit agreement (as amended, the "Intelsat Jackson Secured Credit Agreement"). The Intelsat Jackson Secured Credit Agreement, the indentures governing our existing notes and the terms of our other outstanding indebtedness contain, and any future indebtedness of ours would likely contain, a number of restrictive covenants imposing significant operating and financial restrictions on Intelsat S.A. and some or all of its subsidiaries, including restrictions that may limit our ability to engage in acts that may be in our long-term best interests. The Intelsat Jackson Secured Credit Agreement includes one financial covenant: Intelsat Jackson must maintain a consolidated secured debt to consolidated EBITDA ratio of less than or equal to 3.50 to 1.00 at the end of each fiscal quarter, as such financial measure is defined in the Intelsat

Jackson Secured Credit Agreement.

In addition, the Intelsat Jackson Secured Credit Agreement requires Intelsat Jackson to use a portion of the proceeds of certain asset sales, in excess of a specified amount, that are not reinvested in its business to repay indebtedness under the agreement.

The Intelsat Jackson Secured Credit Agreement, the indentures governing our existing notes and the terms of our other outstanding indebtedness include covenants restricting, among other things, the ability of Intelsat S.A. and its subsidiaries to:

- incur or guarantee additional debt or issue disqualified stock;

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- pay dividends (including to fund cash interest payments at different entity levels), or make redemptions, repurchases or distributions, with respect to ordinary shares or capital stock;
- create or incur certain liens;
- make certain loans or investments;
- engage in mergers, acquisitions, amalgamations, asset sales and sale and leaseback transactions; and
- engage in transactions with affiliates.

In addition, under certain circumstances as described in the Intelsat Jackson Secured Credit Agreement, Intelsat could be required to apply a certain percentage of its Excess Cash Flow (as defined in such agreement), if any, after operational needs for each fiscal year towards the repayment of outstanding term loans, subject to certain deductions. These covenants are subject to a number of qualifications and exceptions. The operating and financial restrictions and covenants in our existing debt agreements and any future financing agreements may adversely affect our ability to finance future operations or capital needs or to engage in other business activities. A breach of any of the restrictive covenants in the Intelsat Jackson Secured Credit Agreement including the financial maintenance covenant referred to above could result in a default under such agreement. If any such default occurs, the lenders under the Intelsat Jackson Secured Credit Agreement may elect to declare all outstanding borrowings, together with accrued interest and other fees, to be immediately due and payable, enforce their security interest or require us to apply all available cash to repay these borrowings. If this occurred under the Intelsat Jackson Secured Credit Agreement, this would result in an event of default under our existing notes. If Intelsat Jackson were unable to repay outstanding borrowings when due, the lenders under the Intelsat Jackson Secured Credit Agreement would have the right to proceed against the collateral granted to them to secure the debt owed to them. If the debt under the Intelsat Jackson Secured Credit Agreement were to be accelerated, our assets might not be sufficient to repay such debt in full or to repay our notes and our other debt.

Our business is capital intensive and requires us to make long-term capital expenditure decisions, and we may not be able to raise adequate capital to finance our business strategies, or we may be able to do so only on terms that significantly restrict our ability to operate our business.

Implementation of our business strategy requires a substantial outlay of capital. As we pursue our business strategies and seek to respond to opportunities and trends in our industry, our actual capital expenditures may differ from our expected capital expenditures and there can be no assurance that we will be able to satisfy our capital requirements in the future. The nature of our business also requires us to make capital expenditure decisions in anticipation of customer demand, and we may not be able to correctly predict customer demand. We have only a fixed amount of transponder capacity available to serve a particular region. If our customer demand exceeds our transponder capacity, we may not be able to fully capture the growth in demand in the region served by that capacity. We currently expect that our liquidity requirements in 2019 will be satisfied by cash on hand and cash generated from our operations. However, if we determine we need to obtain additional funds through external financing and are unable to do so, we may be prevented from fully implementing our business strategy.

The availability and cost to us of external financing depend on a number of factors, including general market conditions, our financial performance and our credit rating. Both our credit rating and our ability to obtain financing generally may be influenced by the supply and demand characteristics of the telecommunications sector in general and of the FSS sector in particular. Declines in our expected future revenue under contracts with customers and challenging business conditions faced by our customers are among factors that may adversely affect our credit. Other factors that could impact our credit include the amount of debt in our current capital structure, activities associated with our strategic initiatives, our expected future cash flows and the capital expenditures required to execute our business strategy. The overall impact on our financial condition of any transaction that we pursue may be negative or may be negatively perceived by the financial markets and ratings agencies and may result in adverse rating agency actions with respect to our credit rating. A disruption in the capital markets, a deterioration in our financial performance or a credit rating downgrade could limit our ability to obtain financing or could result in any such financing being available only at greater cost or on more restrictive terms than might otherwise be available. Our debt

agreements also impose restrictions on our operation of our business and could make it more difficult for us to obtain further external financing if required. See—The terms of the Intelsat Jackson Secured Credit Agreement, the indentures governing our existing notes and the terms of our other indebtedness may restrict our current and future operations, particularly our ability to respond to changes in our business or to take certain actions.

Long-term disruptions in the capital and credit markets as a result of uncertainty due to recessions, changing or increased regulation or failures of significant financial institutions could adversely affect our access to capital. If financial market disruptions intensify, it may become difficult for us to raise additional capital or refinance debt when needed, on acceptable terms or at all. Any disruption could require us to take measures to conserve cash until the markets stabilize or until alternative credit arrangements or other funding for our business needs can be arranged. Such measures could include deferring capital

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expenditures and reducing or eliminating other discretionary uses of cash, which could adversely impact our business and our ability to execute our business strategies.

Our financial condition could be materially and adversely affected if we were to suffer a satellite loss that is not adequately covered by insurance.

We currently carry in-orbit insurance only with respect to a small portion of our satellite fleet, generally for a short period of time following launch. As of December 31, 2018, four of the 54 satellites in our fleet were covered by in-orbit insurance. Amounts recoverable from in-orbit insurance coverage may initially be comparable to amounts recoverable with respect to launch insurance coverage; however, such amounts generally decrease over time and are typically based on our declining potential repayment obligations with respect to certain customer prepayments made prior to or during the manufacture of certain satellites, or the declining book value of the satellite.

As our satellite insurance policies expire, we may elect to reduce or eliminate insurance coverage relating to certain of our satellites to the extent permitted by our debt agreements if, in our view, exclusions make such policies ineffective or the costs of coverage make such insurance impractical and we believe that we can more reasonably protect our business through the use of in-orbit spare satellites, backup transponders and self-insurance. A partial or complete failure of a revenue-producing satellite, whether insured or not, could require additional, unplanned capital expenditures, an acceleration of planned capital expenditures, interruptions in service, a reduction in contracted backlog and lost revenue and could have a material adverse effect on our business, financial condition and results of operations. We do not currently insure against lost revenue in the event of total or partial loss of a satellite.

We also maintain third-party liability insurance on some of our satellites to cover damage caused by our satellites. This insurance, however, may not be adequate or available to cover all third-party liability damages that may be caused by any of our satellites, and we may not in the future be able to renew our third-party liability coverage on reasonable terms and conditions, if at all.

We may become subject to unanticipated tax liabilities that may have a material adverse effect on our results of operations.

Intelsat S.A. and certain of its subsidiaries are Luxembourg-based companies and are subject to Luxembourg taxation for corporations. We believe that a significant portion of the income derived from our communications network will not be subject to tax in certain countries in which we own assets or conduct activities or in which our customers are located, including the United States and the United Kingdom. However, this belief is based on the presently anticipated nature and conduct of our business and on our current position under the tax laws of the countries in which we own assets or conduct activities. This position is subject to review and possible challenge by taxing authorities and to possible changes in law that may have a retroactive effect.

In addition, we conduct business with customers and counterparties in multiple countries and jurisdictions. Our overall tax burden is affected by tax legislation in these jurisdictions and the terms of income tax treaties between these countries and the countries in which our subsidiaries are qualified residents for treaty purposes as in effect from time to time. Tax legislation in these countries and jurisdictions may be amended and treaties are regularly renegotiated by the contracting countries and, in each case, may change. If tax legislation or treaties were to change, we could become subject to additional taxes, including retroactive tax claims or assessments of withholding on amounts payable to us or other taxes assessed at the source, in excess of the taxation we anticipate based on business contracts and practices and the current tax regimes. The extent to which certain taxing jurisdictions may require us to pay tax or to make payments in lieu of tax cannot be determined in advance. Our results of operations could be materially adversely affected if we become subject to a significant amount of unanticipated tax liabilities.

We are subject to political, economic, regulatory and other risks due to the international nature of our operations.

We provide communications services in approximately 200 countries and territories. Accordingly, we may be subject to greater risks than other companies as a result of the international nature of our business operations. We could be harmed financially and operationally by tariffs, taxes, government sanctions and regulatory actions, and other trade barriers that may be imposed on our services, or by political and economic instability in the countries in which we

provide services, for instance in countries heavily reliant on revenues from natural resources. If we ever need to pursue legal remedies against our customers or our business partners located outside of Luxembourg, the United States or the United Kingdom, it may be difficult for us to enforce our rights against them depending on their location. Substantially all of our ongoing technical operations are conducted and/or managed in the United States, Luxembourg and Germany. However, providers of satellite launch services, upon which we are reliant to place our satellites into orbit, locate

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their operations in other countries, including Kazakhstan. Political disruptions in this country could increase the risk of launching the satellites that provide capacity for our operations, which could result in financial harm to us.

Our business is subject to foreign currency risk.

Almost all of our customers pay for our services in U.S. dollars, although we are exposed to some risk related to customers who do not pay in U.S. dollars. Fluctuations in the value of non-U.S. currencies may make payment in U.S. dollars more expensive for our non-U.S. customers, and in certain circumstances, cause us to renegotiate prices or other terms in contracts in order to retain such customers. For instance, our Russian customers and others may face difficulties paying for our services because of recent deterioration in the Russian currency and the relative strength of the U.S. dollar compared to many other currencies. In addition, our non-U.S. customers may have difficulty obtaining U.S. currency and/or remitting payment due to currency exchange controls.

The Sponsor owns a significant amount of our common shares and may have conflicts of interest with us in the future.

Our Sponsor (as defined below in Item 4A—History and Development of the Company—The Sponsors Acquisition Transactions) holds in the aggregate approximately 41% of our common shares. By virtue of its share ownership, the Sponsor may be able to influence decisions to enter into any corporate transaction or other matter that requires the approval of shareholders. Additionally, the Sponsor is in the business of making investments in companies and, although it does not currently hold interests in any business that competes directly or indirectly with us, it may from time to time acquire and hold interests in businesses that compete with us. The Sponsor may also pursue acquisition opportunities that may be complementary to our business, and, as a result, those acquisition opportunities may not be available to us.

We have several large customers and the loss of, or default by, these customers could materially reduce our revenue and materially adversely affect our business.

A limited number of customers provide a substantial portion of our revenue and contracted backlog. For the year ended December 31, 2018, our ten largest customers and their affiliates represented approximately 37% of our revenue. The loss of, or default by, our larger customers could adversely affect our current and future revenue and operating margins.

Some customers have in the past defaulted and, although we monitor our larger customers' financial performance and seek deposits, guarantees and other methods of protection against default where possible, our customers may in the future default on their obligations to us due to bankruptcy, lack of liquidity, operational failure, devaluation of local currency or other reasons. Defaults by any of our larger customers or by a group of smaller customers who, collectively, represent a significant portion of our revenue could adversely affect our revenue, operating margins and cash flows. If our contracted backlog is reduced due to the financial difficulties of our customers, our revenue, operating margins and cash flows would be further negatively impacted.

Reductions or changes in U.S. government spending, including the U.S. defense budget, could reduce our revenue and adversely affect our business.

The U.S. government, through the U.S. Department of Defense and other agencies, is one of our largest customers. Spending authorizations for defense-related and other programs by the U.S. government have fluctuated in the past, and future levels of expenditures and authorizations for these programs may decrease, remain constant or shift to programs in areas where we do not currently provide services. We provide services to the U.S. government and its agencies through contracts that are conditioned upon the continuing availability of Congressional appropriations. Congress usually appropriates funds on a fiscal year basis, even though contract performance may extend over many years. In recent years, there has been a pattern of delays in the finalization and approval of the U.S. government budget, which can create uncertainty over the extent of future U.S. government demand for our services. Furthermore, in light of the current geopolitical situation, with reductions in U.S. operational presence in Iraq, Afghanistan and potentially the Middle East more generally, there may be additional future declines in the U.S. government's demand for and use of our services. To the extent the U.S. government and its agencies reduce spending on commercial satellite services, this could adversely affect our revenue and operating margins.

The loss of the services of key personnel could have a material adverse effect on our business.

Our executive officers and other members of our senior management have been a critical element of our success. These individuals have substantial experience and expertise in our business and have made significant contributions to its growth and success. We have entered into employment agreements with each of our executive officers, including Stephen Spengler, our Chief Executive Officer, Michelle Bryan, our Executive Vice President, General Counsel and Chief Administrative Officer, Michael DeMarco, our Executive Vice President, Operations, Samer Halawi, our Executive Vice President and Chief Commercial Officer, and Jacques Kerrest, our Executive Vice President and Chief Financial Officer (who has informed us that

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he intends to retire in the spring of 2019), and certain targeted retention mechanisms; however, these agreements and mechanisms do not guarantee that these executives will remain with us. The unexpected loss of services of one or more of our executive officers or members of senior management could have a material adverse effect on our business.

Risk Factors Relating to Our Industry

We may experience in-orbit satellite failures or degradations in performance that could impair the commercial performance of our satellites, which could lead to lost revenue, an increase in our cash operating expenses, lower operating income or lost backlog.

Satellites utilize highly complex technology and operate in the harsh environment of space and, accordingly, are subject to significant operational risks while in orbit. These risks include malfunctions, commonly referred to as anomalies that have occurred in our satellites and the satellites of other operators as a result of:

- the satellite manufacturer's error, whether due to the use of new and largely unproven technology or due to a design, manufacturing or assembly defect that was not discovered before launch;
- problems with the power systems of the satellites, including:
  - circuit failures or other array degradation causing reductions in the power output of the solar arrays on the satellites, which could cause us to lose some of our capacity, require us to forego the use of some transponders initially and to turn off additional transponders in later years; and/or
  - failure of the cells within the batteries, whose sole purpose is to power the payload and spacecraft operations during the daily eclipse periods which occur for brief periods of time during two 40-day periods around March 21 and September 21 of each year; and/or
- problems with the control systems of the satellites, including:
  - failure of the primary and/or backup satellite control processor ("SCP"); and/or
  - failure of one or more gyroscope and/or associated electronics that are used to provide satellite attitude information during maneuvers;
- problems with the propulsion systems of the satellites, including:
  - failure of the primary and/or backup thrusters; and/or
  - failure of the Xenon-Ion Propulsion System ("XIPS") used on certain Boeing satellites, which is an electronic propulsion system that maintains the spacecraft's proper in-orbit position; and/or
- general failures resulting from operating satellites in the harsh space environment, such as premature component failure or wear out of mechanisms.

We have experienced anomalies in each of the categories described above. Although we work closely with the satellite manufacturers to determine and eliminate the cause of these anomalies in new satellites and provide for on-satellite backups for certain critical components to minimize or eliminate service disruptions in the event of failure, we may experience anomalies in the future, whether of the types described above or arising from the failure of other systems or components. These anomalies can manifest themselves in scale from minor reductions of equipment redundancy to marginal reductions in capacity to complete satellite failure. Some of our satellites have experienced significant anomalies in the past and some have components that are now known to be susceptible to similar significant anomalies. Each of these is discussed in Item 4B—Business Overview—Satellite Health and Technology. An on-satellite backup for certain components may not be available upon the occurrence of such an anomaly.

Any single anomaly or series of anomalies could materially and adversely affect our operations, our revenues, our relationships with our current customers and our ability to attract new customers for our satellite services. In particular, future anomalies may result in the loss of individual transponders on a satellite, a single beam or multiple beams, a group of transponders on that satellite or the entire satellite, depending on the nature of the anomaly and the availability of on-satellite backups. Anomalies and our estimates of their future effects may also cause a reduction of

the expected service life of a satellite and contracted backlog. Anomalies may also cause a reduction of the revenue generated by that satellite or the recognition of an impairment loss, and in some circumstances could lead to claims from third parties for damages, if a satellite experiencing an anomaly were to cause physical damage to another satellite, create interference to the transmissions on another satellite, cause other satellite operators to incur expenses to avoid such physical damage or interference or lower operating income as a result of an impairment charge. Finally, the occurrence of anomalies may adversely affect our ability to insure our satellites at commercially reasonable premiums, if at all. While some anomalies are covered by insurance policies, others are not or may not be covered. See—Risk Factors Relating to Our Business—Our financial condition could be materially and adversely affected if we were to suffer a satellite loss that is not adequately covered by insurance.

Many of the technical problems we have experienced on our current fleet have been component failures and anomalies. Our Intelsat 804 satellite experienced a sudden and unexpected electrical power system anomaly that resulted in the total loss of

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the satellite in January 2005. The Intelsat 804 satellite was an LM 7000 series satellite, and as of December 31, 2018, we operated one other satellite in the LM 7000 series, Intelsat 805. We believe that the Intelsat 804 satellite failure was most likely caused by a high current event in the battery circuitry triggered by an electrostatic discharge that propagated to cause the sudden failure of the high voltage power system.

Our Galaxy 15 satellite experienced an anomaly in April 2010 resulting in our inability to command the satellite. We transitioned all media traffic on this satellite to our Galaxy 12 satellite, which was our designated in-orbit spare satellite for the North America region. Galaxy 15 is a Star-2 satellite manufactured by Northrup Grumman Innovation Systems ("NGIS"). On December 23, 2010, we recovered command of the spacecraft and subsequently completed diagnostic testing and uploading of software updates that protect against future anomalies of this type. As of December 31, 2018, Galaxy 15 continues to provide normal service.

We may also experience additional anomalies relating to the failure of the SCP in our BSS 601 satellite, various anomalies associated with XIPS in our BSS 601 HP satellites or a progressive degradation of the solar arrays in certain of our BSS 702 satellites.

Three of the BSS 601 satellites that we operated in the past, as well as BSS 601 satellites operated by others, have experienced a failure of the primary and backup SCPs. On February 1, 2010, our Intelsat 4 satellite experienced an anomaly of its backup SCP and was taken out of service. This event did not have a material impact on our operations or financial results. As of December 31, 2018, we operate only one BSS 601 satellite, Intelsat 26.

Certain of the BSS 601 HP satellites have experienced various problems associated with their XIPS. We currently operate four BSS 601 HP satellites of this type, three of which have experienced failures of both XIPS and the other has experienced a partial loss of its XIPS. We may in the future experience similar problems associated with XIPS or other propulsion systems on our satellites.

Two of the three BSS 702 HP satellites that we operate, as well as BSS 702 HP satellites of a similar design operated by others, have experienced a progressive degradation of their solar arrays causing a reduction in output power. Along with the manufacturer, we continually monitor the problem to determine its cause and its expected effect. The power reduction may require us to permanently turn off certain transponders on the affected satellites to allow for the continued operation of other transponders, which could result in a loss of revenues, or may result in a reduction of the satellite’s service life. In 2004, based on a review of available data, we reduced our estimate of the service lives of both satellites due to the continued degradation.

On April 22, 2011, our Intelsat 28 satellite, formerly known as the Intelsat New Dawn satellite, was launched into orbit. Subsequent to the launch, the satellite experienced an anomaly during the deployment of its west antenna reflector, which controls communications in the C-band frequency. The anomaly had not been experienced previously on other STAR satellites manufactured by NGIS, including those in our fleet. The New Dawn joint venture filed a partial loss claim with its insurers relating to the C-band antenna reflector anomaly and all of the insurance proceeds from the partial loss claim were received in 2011. The Ku-band antenna reflector deployed and that portion of the satellite is operating as planned, entering service in June 2011. A Failure Review Board established to determine the cause of the anomaly completed its investigation in July 2011 and concluded that the deployment anomaly of the C-band reflector was most likely due to a malfunction of the reflector sunshield. As a result, the sunshield interfered with the ejection release mechanism, and prevented the deployment of the C-band antenna. The Failure Review Board also recommended corrective actions for Orbital Sciences Corporation satellites not yet launched to prevent reoccurrence of the anomaly. Appropriate corrective actions were implemented on Intelsat 18, which was successfully launched on October 5, 2011, and on Intelsat 23, which was launched in October 2012.

During launch operations of Intelsat 19 on June 1, 2012, the satellite experienced damage to its south solar array. Although both solar arrays are deployed, the power available to the satellite is less than is required to operate 100% of the payload capacity. The Independent Oversight Board, formed by Space Systems/Loral, LLC (“SSL”) and Sea Launch to investigate the solar array deployment anomaly, concluded that the anomaly occurred before the spacecraft separated from the launch vehicle during the ascent phase of the launch, and originated in one of the satellite’s two

solar array wings due to a rare combination of factors in the panel fabrication that was unrelated to the launch vehicle. While the satellite is operational, the anomaly resulted in structural and electrical damage to one solar array wing, which reduced the amount of power available for payload operation. Additionally, we filed a partial loss claim with our insurers relating to the solar array anomaly. We received $84.8 million of insurance proceeds related to the claim in 2013. As planned, Intelsat 19 replaced Intelsat 8 at 166°E, in August 2012.

During orbit raising of Intelsat 33e in September 2016, the satellite experienced a malfunction of the main satellite thruster. Orbit raising was subsequently completed using a different set of satellite thrusters. The anomaly resulted in a delay of

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approximately three months in reaching the geostationary orbit, as well as a reduction in the projected lifetime of the satellite. Intelsat 33e entered service in January 2017. In addition, in February 2017, measurements indicated higher than expected fuel use while performing stationkeeping maneuvers. There is no evidence of any impact to the communications payload. A Failure Review Board has completed investigation of the primary thruster failure and fuel use anomaly.

We may experience a launch failure or other satellite damage or destruction during launch, which could result in a total or partial satellite loss. A new satellite could also fail to reach its designated orbital location after launch. Any such loss of a satellite could negatively impact our business plans and could reduce our revenue.

Satellites are subject to certain risks related to failed launches. Launch failures result in significant delays in the deployment of satellites because of the need both to construct replacement satellites, which can take 24 months or longer, and to obtain other launch opportunities. Such significant delays could materially and adversely affect our operations and our revenue. In addition, significant delays could give customers who have purchased or reserved capacity on that satellite a right to terminate their service contracts relating to the satellite. We may not be able to accommodate affected customers on other satellites until a replacement satellite is available. A customer's termination of its service contracts with us as a result of a launch failure would reduce our contracted backlog. Delay caused by launch failures may also preclude us from pursuing new business opportunities and undermine our ability to implement our business strategy.

Launch vehicles may also under-perform, in which case the satellite may still be placed into service by using its onboard propulsion systems to reach the desired orbital location, resulting in a reduction in its service life. In addition, although we have had launch insurance on all of our launches to date, if we were not able to obtain launch insurance on commercially reasonable terms and a launch failure were to occur, we would directly suffer the loss of the cost of the satellite and related costs, which could be more than $300 million.

On February 1, 2013, the launch vehicle for our Intelsat 27 satellite failed shortly after liftoff and the satellite was completely destroyed. A Failure Review Board was established and subsequently concluded that the launch failed due to the mechanical failure of one of the first stage engine's thrust control components. The satellite and launch vehicle were fully insured, and all of the insurance proceeds from the loss claim were received in 2013.

Since 1980, we and the entities we have acquired have launched 123 satellites. Including the Intelsat 27 satellite, seven of these satellites were destroyed as a result of launch failures, all but one of which occurred prior to 2000. In addition, certain launch vehicles that we have used or are scheduled to use have experienced launch failures in the past. Launch failure rates vary according to the launch vehicle used. Our capital expenditure guidance for 2019 through 2021 assumes investment in five satellites, two of which are in the manufacturing phase. Of the remaining three satellites, no manufacturing contracts have yet been signed.

New or proposed satellites are subject to construction and launch delays, the occurrence of which can materially and adversely affect our operations.

The construction and launch of satellites are subject to certain delays. Such delays can result from delays in the construction of satellites and launch vehicles, the periodic unavailability of reliable launch opportunities, possible delays in obtaining regulatory approvals and launch failures. We have in the past experienced delays in satellite construction and launch which have adversely affected our operations. Future delays may have the same effect. A significant delay in the future delivery of any satellite may also adversely affect our marketing plan for the satellite. If satellite construction schedules are not met, a launch opportunity may not be available at the time a satellite is ready to be launched. Further, any significant delay in the commencement of service of any of our satellites could enable customers who pre-purchased or agreed to utilize transponder capacity on the satellite to terminate their contracts and could affect our plans to replace an in-orbit satellite prior to the end of its service life. The failure to implement our satellite deployment plan on schedule could have a material adverse effect on our financial condition and results of operations. Delays in the launch of a satellite intended to replace an existing satellite that result in the existing satellite reaching its end of life before being replaced could result in loss of business to the extent an in-orbit backup is not

available.

Our dependence on outside contractors could result in increased costs and delays related to the launch of our new satellites, which would in turn adversely affect our business, operating results and financial condition.

There are a limited number of companies that we are able to use to launch our satellites and a limited number of commercial satellite launch opportunities available in any given time period. Adverse events with respect to our launch service providers, such as satellite launch failures or financial difficulties (which some of these providers have previously experienced), could result in increased costs or delays in the launch of our satellites. General economic conditions may also affect the ability of launch providers to provide launch services on commercially reasonable terms or to fulfill their obligations in terms of

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launch dates, pricing, or both. In the event that our launch service providers are unable to fulfill their obligations, we may have difficulty procuring alternative services in a timely manner and may incur significant additional expenses as a result. Any such increased costs and delays could have a material adverse effect on our business, operating results and financial condition.

A natural disaster could diminish our ability to provide communications service.

Natural disasters could damage or destroy our ground stations, resulting in a disruption of service to our customers. We currently have the technology to help safeguard our antennas and protect our ground stations during natural disasters such as a hurricane, but the collateral effects of disasters such as flooding may impair the functioning of our ground equipment. If a future natural disaster impairs or destroys any of our ground facilities, we may be unable to provide service to our customers in the affected area for a period of time and may incur an impairment charge lowering our operating income.

Risk Factors Relating to Regulation

We are subject to orbital slot and spectrum access requirements of the International Telecommunication Union ("ITU") and regulatory and licensing requirements in each of the countries in which we provide services, and our business is sensitive to regulatory changes internationally and in those countries.

The telecommunications industry is highly regulated, and we depend on access to orbital slots and spectrum resources to provide satellite services. The ITU and national regulators allocate spectrum for satellite services, and may change these allocations, which could change or limit how Intelsat's current satellites are able to be used. In addition, in connection with providing satellite capacity, ground network uplinks, downlinks and other value-added services to our customers, we need to maintain regulatory approvals, and from time to time obtain new regulatory approvals, from various countries. Obtaining and maintaining these approvals can involve significant time and expense. If we cannot obtain or are delayed in obtaining the required regulatory approvals, we may not be able to provide these services to our customers or expand into new services. In addition, the laws and regulations to which we are subject could change at any time, thus making it more difficult for us to obtain new regulatory approvals or causing our existing approvals to be revoked or adversely modified. Because the regulatory schemes vary by country, we may also be subject to regulations of which we are not presently aware and could be subject to sanctions by a foreign government that could materially and adversely affect our operations in that country. If we cannot comply with the laws and regulations that apply to us, we could lose our revenue from services provided to the countries and territories covered by these laws and regulations and be subject to criminal or civil sanctions.

If we do not maintain regulatory authorizations for our existing satellites, associated ground facilities and terminals or obtain authorizations for our future satellites, associated ground facilities and terminals, we may not be able to operate our existing satellites or expand our operations.

The operation of our existing satellites is authorized and regulated by the U.S. Federal Communications Commission ("FCC"), the U.K. Office of Communications ("Ofcom") and the U.K. Space Agency ("UKSA"), the National Information & Communications Technology Authority of Papua New Guinea ("NICTA"), the Ministry of Internal Affairs and Communications of Japan, and the Bundesnetzagentur ("BNetzA") in Germany.

We believe our current operations are in compliance with FCC and non-U.S. licensing jurisdiction requirements. However, if we do not maintain the authorizations necessary to operate our existing satellites, we will not be able to operate the satellites covered by those authorizations, unless we obtain authorization from another licensing jurisdiction. Some of our authorizations provide waivers of technical regulations. If we do not maintain these waivers, we will be subject to operational restrictions or interference that will affect our use of existing satellites. Loss of a satellite authorization could cause us to lose the revenue from services provided by that satellite at a particular orbital location to the extent these services cannot be provided by satellites at other orbital locations.

Our launch and operation of planned satellites require additional regulatory authorizations from the FCC or a non-U.S. licensing jurisdiction. Likewise, if any of our current operations are deemed not in compliance with applicable regulatory requirements, we may be subject to various sanctions, including fines, loss of authorizations, or denial of

applications for new authorizations or renewal of existing authorizations. It is not uncommon for licenses for new satellites to be granted just prior to launch, and we expect to receive such licenses for all planned satellites. If we do not obtain required authorizations in the future, we will not be able to operate our planned satellites. If we obtain a required authorization but we do not meet milestones regarding the construction, launch and operation of a satellite by deadlines that may be established in the authorization, we may lose our authorization to operate a satellite using certain frequencies in an orbital location. Any authorizations we obtain may also impose operational restrictions or permit interference that could affect our use of planned satellites.

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If we do not occupy unused orbital locations by specified deadlines, or do not maintain satellites in orbital locations we currently use, those orbital locations and associated frequencies may become available for other satellite operators to use.

If we are unable to place satellites into currently unused orbital locations by specified deadlines and in a manner that satisfies the ITU or national regulatory requirements, or if we are unable to maintain satellites at the orbital locations that we currently use, we may lose our rights and/or priority to use these orbital locations and associated frequencies, and the locations and frequencies with ITU priority could become available for other satellite operators to use. The loss of one or more of our orbital locations could negatively affect our plans and our ability to implement our business strategy.

Coordination results may adversely affect our ability to use a satellite at a given orbital location for our proposed service or coverage area.

We are required to record frequencies and orbital locations used by our satellites with the ITU and to coordinate with other satellite operators and national administrations the use of these frequencies and orbital locations in order to avoid interference to or from other satellites. The results of coordination may adversely affect our use of satellites at particular orbital locations, as well as the type of applications or services that we can accommodate. If we are unable to coordinate our satellites by specified deadlines, we may not be able to use a satellite at a given orbital location for our proposed service or coverage area. The use of our satellites may also be temporarily or permanently adversely affected if the operation of adjacent satellite networks does not conform to coordination agreements resulting in the acceptable interference levels being exceeded (e.g., due to operational errors associated with the transmissions to adjacent satellite networks).

We can provide no assurance as to the likelihood of the FCC's acceptance of the various facets of our C-band Proposal, or as to the actual timing of a final ruling. In addition, even if a final ruling were to be issued that adopted our proposal, we can provide no assurances as to our ability to effectuate agreements to make C-band spectrum available for 5G in the United States or the amount we would receive in such transactions. Furthermore, there are a number of technical challenges to making C-band spectrum available.

On October 2, 2017, Intelsat and Intel Corporation submitted a proposal to the FCC that would enable joint use of 3.7-4.2 GHz C-band spectrum in the United States by fixed satellite services operators and terrestrial mobile services providers (the "C-band Proposal"). The FCC issued a Notice of Proposed Rule Making ("NPRM") in July 2018 that included aspects of our proposal and the proposal is now supported by a consortium of satellite operators comprised of Intelsat, SES Americom, Inc., Eutelsat, and Telesat. The C-band Proposal was not the only proposal that was included in the NPRM. The NPRM's official comment period has concluded, although parties are still able to add to the record. To the extent the FCC does not ultimately accept our proposal, the benefits to Intelsat of making the C-band spectrum available for terrestrial mobile services in the United States could be materially limited. Furthermore, while we believe that there is potential for a final order to be issued by the FCC in 2019, assuming making additional spectrum available for terrestrial mobile services remains a priority for the FCC, we can provide no assurances as to the actual timing of a final ruling. All of these matters are in the control of the FCC.

Even if a final ruling were to be issued that adopted our proposal, we can provide no assurances as to our ability to effectuate agreements for the spectrum or the amount we would receive in such transactions. Our ability to obtain value for making spectrum available for terrestrial mobile services in the United States would be dependent on market forces that we cannot control or predict.

Furthermore, there are a number of technical challenges to making C-band spectrum available for terrestrial mobile services. The technical solutions could include moving services and customers to another portion of the licensed C-band spectrum, implementing filters at earth station antennas, relocating earth station antennas or other technical solutions which may result in significant cost to incumbent satellite operators.

Our failure to maintain or obtain authorizations under the U.S. export control and trade sanctions laws and regulations could have a material adverse effect on our business.

The export of satellites and technical data related to satellites, earth station equipment and provision of services are subject to U.S. Department of State, U.S. Department of Commerce and U.S. Department of Treasury regulations. If we do not maintain our existing authorizations or obtain necessary future authorizations under the export control laws and regulations of the United States, we may be unable to export technical data or equipment to non-U.S. persons and companies, including to our own non-U.S. employees, as required to fulfill existing contracts. If we do not maintain our existing authorizations or obtain necessary future authorizations under the trade sanctions laws and regulations of the United States, we may not be able to provide satellite capacity and related administrative services to certain countries subject to U.S. sanctions. Our ability to acquire new satellites, launch new satellites or operate our satellites could also be negatively affected if our suppliers do not obtain required U.S. export authorizations.

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If we do not maintain required security clearances from, and comply with our agreements with, the U.S. Department of Defense, or if we do not comply with U.S. law, we may not be able to continue to perform our obligations under U.S. government contracts.

To participate in classified U.S. government programs, we sought and obtained security clearances for one of our subsidiaries from the U.S. Department of Defense. Given our foreign ownership, we entered into a proxy agreement with the U.S. government that limits our ability to control the operations of this subsidiary, as required under the national security laws and regulations of the United States. If we do not maintain these security clearances, we will not be able to perform our obligations under any classified U.S. government contracts to which our subsidiary is a party, the U.S. government would have the right to terminate our contracts requiring access to classified information and we will not be able to enter into new classified contracts. As a result, our business could be materially and adversely affected. Further, if we materially violate the terms of the proxy agreement or if we are found to have materially violated U.S. law, we or the subsidiary holding the security clearances may be suspended or barred from performing any U.S. government contracts, whether classified or unclassified, and we could be subject to civil or criminal penalties.

Item 4. Information on the Company

A. History and Development of the Company

The Company

Our legal and commercial name is Intelsat S.A. The Company was organized as a public limited liability company (société anonyme) under the laws of the Grand-Duchy of Luxembourg on July 8, 2011. Our principal executive office is located at 4, rue Albert Borschette, L-1246, Luxembourg, telephone number +352 27 84 1600. The Company is registered with the Luxembourg Registre de Commerce et des Sociétés under number B162135.

Our History

Intelsat, Ltd. was the successor entity to the International Telecommunications Satellite Organization (the “IGO”), and a Bermuda company. The IGO was a public intergovernmental organization created on an interim basis by its initial member states in 1964 and formally established in February 1973 upon entry into force of an intergovernmental agreement. The member states that were party to the treaty governing the IGO designated certain entities to market and use the IGO’s communications system within their territories and to hold investment share in the IGO.

The Privatization

In November 2000, the IGO’s Assembly of Parties unanimously approved our management’s specific plan for our privatization and set the date of privatization for July 18, 2001. On July 18, 2001, substantially all of the assets and liabilities of the IGO were transferred to Intelsat, Ltd., which was domiciled as a Bermuda company.

The IGO, referred to post-privatization as the International Telecommunications Satellite Organization (“ITSO”), was established and was to exist as an intergovernmental organization for a period of at least 12 years after July 18, 2001, and then could be terminated by a decision of a governing body of ITSO called the Assembly of Parties. The Assembly of Parties voted in 2012 to continue ITSO until at least 2021. Pursuant to a Public Services Agreement among ITSO and Intelsat, Ltd. and certain of our subsidiaries, we have an obligation to provide our services in a manner consistent with the core principles of global coverage and connectivity, lifeline connectivity and non-discriminatory access, and ITSO monitors our implementation of this obligation.

The 2005 Acquisition Transactions

On January 28, 2005, Intelsat, Ltd. was acquired by Intelsat Holdings, Ltd. (“Intelsat Holdings”) for total cash consideration of approximately $3.2 billion, with pre-acquisition debt of approximately $1.9 billion remaining outstanding. Intelsat Holdings was initially formed as a Bermuda company.

The PanAmSat Acquisition Transactions

In August 2005, Intelsat (Bermuda), Ltd. (“Intelsat Bermuda”), our indirect wholly-owned subsidiary now known as Intelsat (Luxembourg) S.A., PanAmSat Holding Corporation (“PanAmSat”) and Proton Acquisition Corporation, a wholly-owned subsidiary of Intelsat Bermuda, signed a definitive merger agreement pursuant to which on July 3,

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Bermuda acquired all of the outstanding equity interests in PanAmSat for $25.00 per common share in cash, or approximately $3.2 billion in the aggregate (plus approximately $0.00927 per share as the pro rata share of undeclared regular quarterly dividends).

The Sponsors Acquisition Transactions

On February 4, 2008, Serafina Acquisition Limited completed its acquisition of 100% of the equity ownership of Intelsat Holdings for total cash consideration of approximately $5.0 billion, pursuant to a share purchase agreement among Serafina Acquisition Limited, Intelsat Holdings, certain shareholders of Intelsat Holdings and Serafina Holdings Limited (“Serafina Holdings”) (the “Sponsors Acquisition Transactions”). Serafina Holdings is an entity formed by funds controlled by BC Partners Holdings Limited (the “BCEC Funds” or the "Sponsor") and certain other investors. Subsequent to the execution of the share purchase agreement, two investment funds controlled by Silver Lake Partners, L.P. (“Silver Lake Partners”) and other equity investors joined the BCEC Funds as the equity sponsors of Serafina Holdings. As a result of completion of the Sponsors Acquisition Transactions and related financing transactions, we and our subsidiaries assumed aggregate net incremental debt of approximately $3.7 billion.

The Luxembourg Migration

On December 15, 2009, Intelsat, Ltd. and certain of its parent holding companies and subsidiaries migrated their jurisdiction of organization from Bermuda to Luxembourg (the “Migration”). As a result of the Migration, our headquarters are located in Luxembourg. Each company that migrated has continued its corporate and legal personality in Luxembourg. Subsequent to the Migration, Intelsat Global, Ltd. became known as Intelsat Global S.A., Intelsat Global Subsidiary, Ltd. became known as Intelsat Global Subsidiary S.A., Intelsat Holdings, Ltd. became known as Intelsat Holdings S.A., Intelsat, Ltd. became known as Intelsat S.A., Intelsat (Bermuda), Ltd. became known as Intelsat (Luxembourg) S.A. and Intelsat Jackson Holdings, Ltd. became known as Intelsat Jackson Holdings S.A.

The Initial Public Offering

On April 23, 2013, we completed our initial public offering, in which we issued 22,222,222 common shares, and a concurrent public offering, in which we issued 3,450,000 5.75% Series A mandatory convertible junior non-voting preferred shares (the “Series A Preferred Shares”), at public offering prices of $18.00 and $50.00 per share, respectively (the initial public offering together with the concurrent public offering, the “IPO”), for total proceeds of $572.5 million (or approximately $550 million after underwriting discounts and commissions). In connection with the IPO, on April 16, 2013, the name of the Company was changed from Intelsat Global Holdings S.A. to Intelsat S.A. In May 2016, all of the outstanding Series A Preferred Shares were converted in accordance with their terms into common shares.

B. Business Overview

Overview

We operate one of the world’s largest satellite services businesses, providing a critical layer in the global communications infrastructure.

We provide diversified communications services to the world’s leading media companies, fixed and wireless telecommunications operators, data networking service providers for enterprise and mobile applications in the air and on the seas, multinational corporations and Internet Service Providers (“ISPs”). We are also the leading provider of commercial satellite communication services to the U.S. government and other select military organizations and their contractors. Our network solutions are a critical component of our customers’ infrastructures and business models. Generally, our customers need the specialized connectivity that satellites provide so long as they are in business or pursuing their mission. In recent years, mobility services providers have contracted for services on our fleet that support broadband connections for passengers on commercial flights, cruise ships and commercial shipping, connectivity that in some cases is only available through our network. In addition, our satellite neighborhoods provide our media customers with efficient and reliable broadcast distribution that maximizes audience reach, a technical and economic benefit that is difficult for terrestrial services to match. In developing regions, our satellite solutions often

provide higher reliability than is available from local terrestrial telecommunications services and allow our wireless and enterprise customers to reach geographies that they would otherwise be unable to serve.

In the future, we expect our Globalized Network to be an integral part of machine-to-machine networks, especially those requiring massive software updates best delivered via broadcast, such as networks connecting cars and other vehicles. As we invest in new constellations, such as our Intelsat Epic^{NG} high-throughput satellite platform and partner on new low earth orbit (“LEO”) satellites, and new ground technologies, such as electronic antennas and standards-based modems, we are creating a

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portfolio of solutions that will be interoperable with other telecommunications technologies and seamlessly integrated with other telecommunications solutions to address the immense connectivity requirements of a fully-connected and converged landscape.

We hold the largest collection of rights to well-placed orbital slots in the most valuable C- and Ku-band spectrums. From these locations, our satellites are able to offer services in the established regions historically using the most satellite capacity, as well as the higher growth emerging regions, where approximately 60% of our capacity is currently focused.

We believe our global scale, Globalized Network, leadership position and valuable customer relationships enable us to benefit from growing demand for reliable broadband connectivity, resulting from trends such as:

- Global distribution of television entertainment and news programming to fixed and mobile devices;
- Completion and extension of international, national and regional data networks, fixed and wireless, notably in emerging regions, and the upgrade of those networks to 3G/4G/5G as content is increasingly consumed on mobile devices;
- Universal access to broadband connectivity through fixed and mobile networks for consumers, corporations, government and other organizations;
- Increasing deployment of in-flight and on-board broadband access for consumer and business applications in the commercial, business aviation and maritime sectors;
- Requirements for cost-efficient space-based network solutions for fixed and mobile government and military applications; and
- Global demand for services which enable connected devices, such as machine-to-machine communications and the Internet of Things ("IoT"), particularly with respect to connected car applications.

We believe that we have the largest, most reliable and most technologically advanced commercial communications network in the world. Our global communications system features a fleet of 54 geosynchronous satellites as of December 31, 2018 that covers more than 99% of the world's populated regions. Our satellites primarily provide services in the C- and Ku-band frequencies, which form the largest part of the FSS sector.

Our next generation fleet of six high-throughput satellites, known as Intelsat Epic^{NG}, are designed specifically to reduce cost of service by optimizing performance and efficiency to the user. We expect we will be able to provide commercial customers with services that allow them to innovate and develop new high bandwidth applications, in turn transforming their businesses and expanding the territories that they can profitably serve. Our new Intelsat Epic^{NG} fleet is designed to commercial-grade standards. This allows us to offer committed information rates for our service provider customers, as compared to satellite networks designed primarily to provide consumer "best effort"-grade services.

Our satellite capacity is complemented by our IntelsatOne® terrestrial network and a growing suite of Flex managed services optimized to the requirements of attractive vertical applications, including the maritime and aeronautical sectors. Our managed services combine satellite services with network management, access to our terrestrial network comprised of leased fiber optic cable, access to Internet points of presence ("PoPs"), as well as multiplexed video and data platforms. Our satellite-based networking solutions offer distinct technical and economic benefits to our target customers and provide a number of advantages over terrestrial communications systems, including the following:

- Fast, scalable, secure and high performance infrastructure deployments;
- Superior end-to-end network availability as compared to the availability of terrestrial networks, due to fewer potential points of failure;
- Highly reliable bandwidth and consistent application performance, as satellite beams effectively blanket service regions;
- Ability to extend beyond terrestrial network end points or to provide an alternative path to terrestrial infrastructure;

- Efficient content distribution through the ability to broadcast high quality signals from a single location to many locations simultaneously;
- Maximizing potential distribution of television programming, video neighborhoods, or capacity at orbital locations with a large number of consumer dishes or cable headend dishes pointed to them; and
- Rapidly deployable communications infrastructure for disaster recovery.

We believe that our hybrid satellite-terrestrial network, combined with the world's largest collection of FSS spectrum rights, is a unique and valuable asset.

Our network architecture is flexible and, coupled with our global scale, provides strong capital and operating efficiency. In certain circumstances we are able to re-deploy capacity, moving satellites or repositioning beams to capture demand. In

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2018, we launched the final next generation Intelsat Epic^{NG} satellite, Horizons 3e, which was placed into service in early 2019. Our technology has utility across a number of requirements with minimal customization to address diverse applications.

We have a reputation for operational and engineering excellence, built on our experience of over 50 years in the communications sector. Our network delivered 99.997% network availability on all satellites to our customers in 2018. We operate our global network from a fully-integrated, centralized satellite operations facility, with regional sales and marketing offices located close to our customers. The operational flexibility of our network is an important element of our differentiation and our ability to grow.

As of December 31, 2018, our contracted backlog, which is our expected future revenue under existing customer contracts, was approximately $8.1 billion, roughly four times our 2018 annual revenue. For the year ended December 31, 2018, we generated revenue of $2.2 billion and net loss attributable to Intelsat S.A. of $599.6 million. Our Adjusted EBITDA, which consists of EBITDA as adjusted to exclude or include certain unusual items, certain other operating expense items and certain other adjustments, was $1.7 billion, or 77% of revenue, for the year ended December 31, 2018.

In 2016, and to a lesser extent in 2017, the satellite sector encountered pricing pressure in certain regions and applications, which affected our business. Also during those periods, older point-to-point and trunking services renewed at a much lower rate than our other services, pressuring revenue. In 2018, we continued to experience pricing pressure, but at a slower rate of decline than experienced in earlier periods, particularly in certain regions and applications. In addition, underlying trends in our media business resulted in lower renewal rates and new business capture. Overall, we believe we benefit from a number of characteristics that allow us to effectively manage our business despite these competitive and geo-economic pressures:

- Significant long-term contracted backlog, providing a foundation for predictable revenue streams;
- The entry into service of our next generation Intelsat Epic^{NG} platform. Our Intelsat Epic^{NG} platform was designed to support new services representing $4.5 billion of potential incremental growth by 2023 from expanded enterprise, wireless infrastructure, mobility, IoT and government applications;
- High operating leverage, which has allowed us to generate an average Adjusted EBITDA margin of 77% in the past three years; and
- A stable, efficient and sustainable tax profile for our global business.

We believe that our leadership position in our attractive sector, global scale, efficient operating and financial profile, diversified customer sets and sizeable contracted backlog, together with the growing worldwide demand for reliable broadband connectivity everywhere at all times, provide us with a platform for long-term success.

Our Sector

Satellite services are an integral and growing part of the global communications infrastructure. Through unique capabilities, such as the ability to effectively blanket service regions, to offer point-to-multipoint distribution and to provide a flexible architecture, satellite services complement, and for certain applications are preferable to, terrestrial telecommunications services, including fiber and wireless technologies. The FSS sector, excluding all consumer broadband, is expected to generate revenues of approximately $11.7 billion in 2019, and transponder service revenue is expected to grow by a compound annual growth rate (“CAGR”) of 2.6% from 2018 to 2023 according to a study issued in 2018 by NSR, a leading international market research and consulting firm specializing in satellite and wireless technology and applications.

In recent years, the addressable market for FSS has expanded to include mobile applications because of satellite’s ability to provide the broadband access required by high bandwidth mobile platforms, such as for consumer broadband services on commercial ships and aircraft, as well as military mobility applications, including unmanned aerial vehicles.

Satellite services provide secure bandwidth capacity ideal for global in-theater communications since military operations often occur in locations without reliable communications infrastructure. According to a study by NSR, global revenue from FSS used for government and military applications is expected to grow at a CAGR of 5.3% from 2018 to 2023.

Our sector is noted for having favorable operating characteristics, including long-term contracts, high renewal rates and strong cash flows. The fundamentals of the sector are attractive, given the global need for connectivity everywhere and explosion of global content. The expected growth in demand for satellite-based solutions, combined with the high operating margins which are characteristic of the sector, provides a resilient business model.

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There is a finite number of geostationary orbital slots in which FSS satellites can be located, and many orbital locations are already occupied by operational satellites pursuant to complex regulatory processes involving many international and national governmental bodies. These satellites typically are operated under coordination agreements designed to avoid interference with other operators' satellites. See—Regulation below for a more detailed discussion of regulatory processes relating to the operation of satellites.

A resurgence of interest in LEO and mid-earth orbit constellations is resulting in the potential for new satellite-based solutions that will complement and, in some cases, compete with our services. We are an investor in one such constellation, with which we plan to offer integrated solutions. See—Our Strategy below. We believe that the ability of our GEO satellites to offer highly efficient point-to-multipoint services, and to concentrate throughput over areas of highest demand, provides us with competitive benefits that will be sustained even as new services come to market. Today, there are only four FSS operators, including us, providing global services, which is important as multinationals and governments seek a one-stop solution for obtaining global connectivity. In addition, there are a number of operators with fewer satellites that provide regional and/or national services. We currently hold the largest number of rights to orbital slots in the most valuable C- and Ku-band spectrums.
We believe a number of fundamental trends in our sector are creating increasing demand for satellite services:

- Connectivity and broadband access are essential elements of infrastructure supporting the rapid economic growth of developing nations. Globally dispersed organizations and regional businesses often turn to satellite-based infrastructure to provide better access, reliability and control of broadband services. Penetration of broadband connectivity in less developed regions has been growing rapidly and is expected to continue. Over the past 10 years, broadband penetration, including satellite connectivity, in the East Asia & Pacific Ocean regions grew at a 15% CAGR, in the Latin America & Caribbean region at a 14% CAGR, and in the Middle East & North Africa regions at a 20% CAGR, according to the World Bank.
- Wireless infrastructure in the global race to 5G represents a potentially generational opportunity for satellite technology. Wireless telecommunications companies often use satellite-based solutions to extend networks into areas where geographic or low population density makes it economically unfeasible to deploy other technology. Further deployments of wireless telecom infrastructure and the migration from 2G to 3G, 4G and 5G networks, which adds content and data to basic voice communications, create demand for satellite bandwidth. We believe that the emergence of 5G networks results in a new growth vector for satellite connectivity. Satellite technology is uniquely responsive to the 5G requirement of ubiquitous coverage and fast deployments. We believe satellite systems will complement terrestrial networks and enable reliable and consistent global 5G user experience in a cost-effective manner. In 2018, 3GPP, the telecommunications standard development organization, approved work item studies to incorporate satellite systems in 5G standards to demonstrate key satellites attributes, including broadcasting, multicasting, and ubiquity and global mobile connectivity. According to GSMA, 4G & 5G mobile connections are expected to increase from 29% to 67% of total connections for the period from 2017 to 2025.
- Mobility applications, such as maritime communications and aeronautical broadband services for commercial and government applications, are fueling demand for mobile connectivity. Commercial applications, such as broadband services for consumer air flights and cruise ships, as well as broadband requirements from the maritime commercial shipping and oil and gas sectors, provide increased demand for satellite-based services. The increasing demand for global broadband connectivity on commercial airlines is a key driver of satellite connectivity and services. 78% of North American aircraft provide in-flight entertainment and wi-fi services, while about 13% of Europe, Africa, Asia Pacific and South America aircraft were connected in 2018, according to Valour Consultancy and Boeing. Global satellite services revenue related to demand for broadband mobility applications from land, aeronautical and maritime is expected to grow at a CAGR of 20% for the period from 2018 to 2023, according to NSR.
- Globalization of economic activities is increasing the geographic expansion of corporations and the communications networks that support them, while creating new audiences for content. Globalization also increases the

communications requirements for governments supporting embassy and military applications.

- The emergence of new content consumers resulting from economic growth in developing regions leads to increased demand for free-to-air and pay-TV content. According to NSR, the highest expected growth in television channels is from developing regions, including Latin America at a CAGR of 2.8%, Middle East and North Africa at 2.7%, Sub-Saharan Africa at 4.6%, and Asia Pacific at 2.5% for the period from 2018 to 2023, respectively.
- Proliferation of formats and new sources of entertainment content result in increased bandwidth requirements, as content owners seek to maximize distribution to multiple viewing audiences across multiple technologies. HDTV, the introduction of ultra-high definition ("UHD") television, internet distribution of traditional television programming known as "Over the Top" or "OTT", and video to mobile devices are all examples of the expanding format and distribution requirements of media programmers, the implementation of which varies greatly from developed to

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emerging regions. In its 2018 study, NSR forecasted that the aggregate number of standard definition ("SD"), high definition ("HD"), and UHD television channels distributed worldwide for cable, broadcast and DTH is expected to grow at a CAGR of 2% for the period from 2018 to 2023.

- Connected Devices and vehicles, such as those contemplated by machine-to-machine communications, the IoT and other future technology trends, will require ubiquitous coverage that might be best provided by satellite technology for certain applications in certain regions, and also for applications where ubiquitous, global access is required, such as enabling software downloads for connected cars marketed by the automotive sector or for the operations of connected vehicles, such as in agriculture applications. This represents an important potential source of longer-term demand.

In total, transponder service revenue (excluding consumer broadband) is expected to grow at a CAGR of 2.6% for the period from 2018 to 2023, according to NSR.

Our Customer Sets and Growing Applications

We focus on business-to-business services that indirectly enable enterprise, government and consumer applications through our customers. Our customer contracts offer four different service types: transponder services, managed services, channel services and mobile satellite services and other. See Item 5—Operating and Financial Review and Prospects—Revenue for further discussion of our service types. Characteristics of our customer sets are summarized below:

Customer Set	Representative Customers	Year	Annual Revenue (1) (2)	% of 2018 Total Revenue (2)	% of 2018 Total Backlog (1) (2)	Backlog to 2018 Revenue Multiple
Network Services	Marlink, BT, Orange, Speedcast, Global	2016	$ 900			
	Eagle, Verizon, Vodafone, America Movil,	2017	$ 852			
	Gogo, Panasonic Avionics, Telecom Italia Mobile	2018[3]	$ 798	37 %	26 %	2.6x
Media	Discovery Communications, Fox Broadcasting Company	2016	$ 868			
	Entertainment Group, MultiChoice, Home	2017	$ 910			
	Box Office, AT&T, The Walt Disney Company, Turner	2018[4]	$ 938	43 %	62 %	5.4x
Government	Australian Defence Force, U.S. Department	2016	$ 387			
	of Defense, U.S. Department of State,	2017	$ 353			
	Leonardo	2018[5]	$ 392	18 %	10 %	2.1x

(1) Dollars in millions; backlog as of December 31, 2018.
(2) Does not include satellite-related services and other.
(3) Includes $3 million of ASC 606 adjustments.
(4) Includes $67 million of ASC 606 adjustments.
(5) Includes $33 million of ASC 606 adjustments.

We provide satellite capacity and related communications services for the transmission of video, data and voice signals. Our customer contracts cover on- and off-network capacity with primarily three different service types:

On-Network:

- Transponder services
- Managed services

Off-Network:

- Transponder services
- Mobile satellite services and other

We also perform satellite-related consulting services and technical services for various third parties, such as operating satellites for other satellite owners. We no longer proactively market a fourth service, known as channel services, although we still earn modest revenues from this type of on-network service.

Media

Media customers are our largest customer set and accounted for 43% of our revenue for the year ended December 31, 2018 and $5.1 billion of our contracted backlog as of December 31, 2018. Our business generated from the media sector is

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generally characterized by non-cancellable, long-term contracts with terms of up to 15 years with premier customers, including national and global broadcasters, content providers and distributors, television programmers and DTH platform operators.

We are the world's largest provider of satellite capacity for media services, according to Euroconsult, with a 20% global share. We have delivered television programming to the world since the launch of our first satellite, Early Bird, in 1965. We provide satellite capacity for the transmission of entertainment, news, sports and educational programming for over 300 broadcasters, content providers and DTH platform operators worldwide. We have well-established relationships with our media customers, and in some cases have distributed their content on our satellites for over 30 years.

Broadcasters, content providers and television programmers seek efficient distribution of their content to make it easily obtainable by affiliates, cable operators and DTH platforms; satellites' point-to-multipoint capability is difficult to replicate via terrestrial alternatives. Our strong cable distribution neighborhoods offer media customers high penetration of regional and national audiences.

Broadcasters, content providers and television programmers also select us because our global capabilities enable the distribution or retrieval of content to or from virtually any point on earth. For instance, we regularly provide fully integrated global distribution networks for content providers that need to distribute their products across multiple continents. DTH platform operators use our services because of our attractive orbital locations and because the scale and flexibility of our fleet can improve speed to market and lower their operating risk, as we have multiple satellites serving every region.

We believe that we enjoy a strong reputation for delivering the high network reliability required to serve the demanding media sector. As our media customers add additional distribution platforms and adopt new business models, such as OTT internet-delivered content, our goal is to deliver value beyond our cost-efficient linear distribution solutions to include cloud-based services that streamline multi-format content delivery.

Our fully integrated satellite, fiber and teleport facilities provide enhanced quality control for programmers. In addition to basic satellite services, we offer bundled, value-added services under our IntelsatOne brand that include managed fiber services, digital encoding of video channels and up-linking and down-linking services to and from our satellites and teleport facilities. Our IntelsatOne® bundled services address programmers' interests in delivering content to multiple distribution channels, such as television and Internet, and their needs for launching programs to new regions in a cost-efficient manner.

Highlights of our media business include the following:

- Our fleet hosts 37 premium video neighborhoods, offering programmers superior audience penetration, with 10 serving North America, nine serving Latin America, eight serving Africa and the Middle East, six serving Asia and four serving Europe;
- We are a leading provider of services used in global content distribution to media customers, according to Euroconsult. Our top 10 video distribution customers buy service on our network, on average, across three or more geographic regions, demonstrating the value provided by the global reach of our network;
- We believe that we are the leading provider of satellite service capacity for the distribution of cable television programming in North America, with thousands of cable headends pointed to our satellites. Our Galaxy 13 satellite provided the first HD neighborhood in North America, and today, our Galaxy fleet distributes over 350 HD channels; globally, we distribute over 5,400 TV channels, including approximately 1,350 HD channels;
- We are a leading provider of satellite services for DTH providers, supporting 29 DTH platforms around the world, including AT&T DIRECTV in Latin America, Orion Express in Russia, Telefonica in Brazil, MultiChoice in Africa, and Canal+ in multiple regions;
- We are a leading provider of services used in video contribution managed occasional use services, supporting coverage of major events for news and sports organizations, according to Euroconsult. For instance, we have carried

programming on a global basis for every Olympiad since 1968, including use of our Intelsat 29e satellite for transmission of certain programming for the 2016 Olympics in Rio de Janeiro, Brazil; and

- In its 2018 study, NSR forecasted that the number of SD, HD, and UHD television channels distributed worldwide for cable, broadcast and DTH is expected to grow at a CAGR of 2% for the period from 2018 to 2023. According to NSR, the highest expected growth in television channels is from developing regions, including Latin America at a CAGR of 2.8%, Middle East and North Africa at 2.7%, Sub-Saharan Africa at 4.6%, and Asia Pacific at 2.5% for the period from 2018 to 2023, respectively.

In 2018, several non-renewals, the largest of which were in the Latin America, North America and Asia-Pacific regions, caused our media business to underperform our expectations for the year. In 2019, we expect continuing pressure on our media business. Broadly, our global media customers increasingly seek to economize due to the need to support expanding

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infrastructure requirements. We expect customers to use compression, the elimination of distribution of standard definition feeds, and reduced commitments for contribution and ad hoc requirements, which will result in reduced volume for our business. In time, we expect some incremental demand for capacity to support the new 4K format, also known as UHD, which could offset some of the reductions in demand related to compression.

Network Services

Network services is our second largest customer set and accounted for 37% of our revenue for the year ended December 31, 2018 and $2.1 billion of our contracted backlog as of December 31, 2018. Our business generated from the network services sector is generally characterized by non-cancellable contracts, typically up to five years in length, with many of the world's leading communications providers. This includes fixed and wireless telecommunications companies, such as global carriers and regional and national providers in emerging regions, corporate network service providers, such as VSAT services providers to vertical markets including banks, value-added services providers, such as those serving the aeronautical and maritime industries, as well as multinational corporations and other organizations operating globally.

According to Euroconsult, we are the world's largest provider of satellites capacity for network services, with a 28% global share. Our satellite services, comprised of satellite capacity, and terrestrial network comprised of leased fiber, teleports and data networking platforms, enable the transmission of video and data to and from virtually any point on the surface of the earth. Basic communications and broadband connectivity in developed and emerging regions are meaningful contributors to economic growth. We provide an essential element of the communications infrastructure, enabling the rapid expansion of wireless services that support businesses, communities and governments in many emerging regions.

Our network services offerings are an essential component of our customers' services, providing backbone infrastructure, expanded service areas and connectivity where reliability or geography is a challenge. We believe that we are a preferred provider because of our global service capability and our expertise in delivering services with enterprise-grade network availability and efficient network control.

Furthermore, as mobile communications have become essential to global networking and internet use, our satellite solutions, such as those provided by the Intelsat Epic^{NG} platform, are being used for mobility applications. This includes services ranging from maritime enterprise VSAT data services to consumer broadband connectivity for cruise ships. In addition to maritime applications, Intelsat's satellite solutions are used by service providers to deliver broadband connectivity for in-flight entertainment and wi-fi services for the aeronautical industry.

Our managed services, including Flex Enterprise and Flex Maritime, provide regional shared data networking platforms at our teleports that are connected to approximately 40 of our satellites, with network transmissions managed by our operations team. In 2018, we introduced new platform as a service (PaaS) offerings under the AgileCore brand, combining our satellite services with shared data platforms and our fiber network. As a result, our customers can quickly establish highly reliable services across multiple regions, yet operate them on a centralized basis. Our satellite-based solutions allow customers to rapidly expand their service territories, flexibly customize the access speed and capabilities for their existing networks and efficiently address new customer and end-user requirements. In 2018, we introduced Flex managed services that are customized to the business jet (FlexExec), joining the Flex Maritime managed service introduced in 2017.

Our leading position in network services has been pressured by new capacity from other satellite operators and improved access to fiber links, changing the competitive environment in certain regions. The increase in satellite supply resulted in significant declines in pricing beginning in 2013, although the rate of decline has reduced over time. In addition, the increase in the availability of fiber has resulted in the accelerated retirement of our channel business, which essentially reached end of lifecycle at 2015 year end, and our international point-to-point trunking services, which was a continuing source of decline in 2018. The new and differentiated capacity of our next generation Intelsat Epic^{NG} satellites is providing inventory to help offset these recent trends, targeting wireless infrastructure, mobility and enterprise applications. In 2018, we successfully added new distribution channels in the maritime, business jet and

wireless infrastructure verticals. As the volume of services sold on our Intelsat Epic^{NG} fleet increases over time, we believe that the level of business activity in this sector will stabilize.

Highlights of our network services business include the following:

- Our largest network services customer type is enterprise networking. We are the world's largest provider of satellite capacity for satellite-based private data networks, including VSAT networks, according to Euroconsult;
- The second largest and fastest growing customer type in our network services business is mobility services for the aeronautical and maritime sectors. We believe we hold a leading share of the aeronautical broadband services powering in-flight passenger connectivity. FSS revenue growth related to capacity demand for broadband aeronautical

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services is expected to grow from approximately $251 million to $1.2 billion annually, for the period from 2018 to 2023, at a CAGR of 37%. In addition, Euroconsult forecasts growth in FSS aeronautical terminals (excluding MSS and air-to-ground technology) at a CAGR of 23% for the period from 2018 to 2023.

- We are the leader in the provision of FSS bandwidth for maritime broadband connectivity. FSS VSAT terminal related to capacity demand for maritime broadband services (excluding MSS) is expected to grow at a CAGR of 15% for the period from 2018 to 2023. Of the world's largest cruise vessels, Intelsat's services are incorporated in the broadband infrastructure for over 80% of approximately 300 ships, in substantially all cases as the exclusive or primary source of satellite services;
- Infrastructure for wireless operator services represents our third largest network services customer type. We believe we are the leading provider of satellite capacity for cellular backhaul applications in emerging regions, connecting cellular towers to the global telecommunications network, a global sector expected to generate over $1 billion in revenue in 2019, according to NSR. Approximately 100 of our customers use our satellite-based backhaul services as a core component of their network infrastructure due to unreliable or non-existent terrestrial infrastructure. Our cellular backhaul customers include 6 of the top 10 mobile groups worldwide, which serve a quarter of the world's subscribers, excluding China;
- Approximately 135 value-added network operators use our IntelsatOne broadband hybrid infrastructure to deliver their regional and global services. Applications for these services include corporate networks for multinationals, internet access and broadband for maritime and commercial aeronautical applications. C, Ku, Ka-band and HTS revenue from capacity demand for mobility applications is expected to grow at a CAGR of 20% for the period from 2018 to 2023, according to NSR; and
- The fixed enterprise VSAT sector (excluding all non-GEO HTS bandwidth) is expected to generate capacity revenues of approximately $2.3 billion in 2019, and capacity revenues are expected to grow at a CAGR of 10% from 2018 to 2023, according to NSR.

Government

We are the leading provider of commercial satellite services to the government sector, according to NSR, with a 25% share of military and government use of use of commercial satellite capacity worldwide. With more than 50 years of experience serving this customer set, we have built a reputation as a trusted partner for the provision of highly customized, secure and mission critical satellite-based solutions. The government sector accounted for 18% of our revenue for the year ended December 31, 2018 and $823 million of our contracted backlog as of December 31, 2018. Our satellite communication services business generated from the U.S. government sector is generally characterized by single year contracts that are cancellable by the customer upon payment of termination for convenience charges, and include annual options to renew for periods of up to four additional years. In addition to communication services, our backlog includes some longer-term services, such as hosted payloads, which are characterized by contracts with originally contracted service periods extending up to the 15-year life of the satellite, cancellable upon payment of termination penalties defined by the respective contracts.

Our customer base includes the U.S. government's military and civilian agencies, global government militaries, and commercial customers serving the defense sector. We consider each party within the U.S. Department of Defense and other U.S. government agencies that has the ability to initiate a purchase requisition and select a contractor to provide services to be a separate customer, although such party may not be the party that awards us the contract for the services.

We attribute our strength in serving U.S. military and government users to our global infrastructure of satellites, including the addition of the high-performance Intelsat Epic^{NG} fleet, and our IntelsatOne network of teleports and fiber that complement the U.S. government's own communications networks. Our fleet provides flexible, secure and resilient global network capacity, and critical surge capabilities. Our Intelsat Epic^{NG} satellites provide high-throughput and performance that is highly attractive for aeronautical surveillance applications, offering HD video from small antennas, enabling use of a smaller airframe. In some instances, we provide our U.S. government customers managed,

end-to-end secure networks, combining our resources in space and on the ground, for fixed and mobile applications. In responding to certain unique customer requirements, we also procure and integrate satellite services provided by other satellite operators, either to supplement our capacity or to obtain capacity in frequencies not available on our fleet, such as L-band, X-band and other spectrums not available on our network. These off-network services are generally low risk in nature, typically with the terms and conditions of the third-party capacity and services we procure matched to contractual commitments from our customer. We are an attractive supplier to the government sector because of our ability to leverage not only our assets but also other space-based solutions, providing a single contracting source for multiple, integrated technologies.

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Highlights of our government business include the following:

- We are increasing our focus on managed services for government applications, simplifying the use of high throughput services. In 2018, we introduced a global managed end-to-end service providing cost-effective, high-performance, in-flight broadband connectivity to a wide range of military aircraft. The service, branded FlexAir, supports en route communications and intelligence, surveillance, and reconnaissance (ISR) applications, as well as in-flight communications for government officials, troops, and cargo aircraft. Expanding our marketing capabilities, we also announced the signing of two distributors with expertise in the government aeronautical sector.
- The reliability and scale of our fleet and planned launches of new and replacement satellites allow us to address changing demand for satellite coverage and to provide mission-critical communications capabilities. For example, in 2018, we were awarded a hosted payload contract that will support aviation navigation systems for the U.S. Federal Aviation Administration ("FAA"). The payload will be part of the FAA's Wide Area Augmentation System ("WAAS") that corrects and enhances information provided by Global Positioning System ("GPS") satellites to give commercial and civilian pilots more precise approach and departure guidance. WAAS provides safety improvements in the National Air Space and has been operational since 2003. This hosted payload, known as Geostationary Earth Satellite (GEO) 7, is the seventh payload delivering a continuous and robust signal in space across the contiguous United States and Alaska. This payload is part of an ongoing WAAS constellation replenishment/sustainment effort by the FAA.
- The U.S. government and military is one of the largest users of commercial satellites for U.S. government and military applications on a global basis. In 2018, we served approximately 100 customers consisting of U.S. government customers, resellers to U.S. government customers or integrators.
- According to a study by NSR, global revenue from FSS used for U.S. government and military applications is expected to grow at a CAGR of 5.3% for the period from 2018 to 2023.

Overall, business activity in this customer set reflects the current tempo of our end-customers' operations and the budgetary constraints of the U.S. government; visibility into the U.S. government's planned contract awards remains low and the pace of new business and subsequent awards remains flat.

Over the mid-term, we believe our reputation as a provider of secure solutions, our global fleet including our new high-performance Intelsat Epic^{NG} platform and affiliated FlexAir managed service, our well-established customer relationships, our ability to provide turn-key services and our demonstrated willingness to reposition or procure capacity to support specific requirements position us to successfully compete for commercial satellite solutions for bandwidth-intensive military and civilian applications. We expect our government business to benefit over time from the increasing demands for mobility services from the U.S. government for aeronautical and ground mobile requirements.

Our Diverse Business

Our revenue and backlog diversity spans customer sets and applications, as discussed above, as well as geographic regions and satellites. We believe our diversity allows us to recognize trends to capture new growth opportunities, and gain experience that can be transferred to customers in different regions. For further details regarding geographic distribution of our revenue, see Note 17 to our consolidated financial statements included elsewhere in this Annual Report.

We believe we are the sector leader by transponder share in three of the geographic regions covered by our network. We are generally ranked first or second in the regions identified by industry analysts as those that either purchase the most satellite capacity or are regions with high growth prospects, such as North America and Asia Pacific.

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The scale of our fleet can also reduce the financial impact of satellite failures and protect against service interruption. No single satellite generated more than 6% of our revenue and no single customer accounted for more than 11% of our revenue for the year ended December 31, 2018.

The following chart shows the geographic diversity of our contracted backlog as of December 31, 2018 by region and service sector, based upon the billing address of the customer.

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The majority of our on-network revenue aligns to emerging regions, based upon the position of our satellites and beams. The following chart shows the breakdown of our on-network revenue by the region in which the service is delivered as of December 31, 2018:

Our Strategy: Transforming Our Business and Our Sector

We are transforming our business and sector, investing in and deploying innovative new technologies that will change the types of applications that we can serve and increase our share of the global demand for broadband connectivity everywhere—for all communities and for all devices.

Our strategy is built around four competitive advantages that strengthen our ability to reach our goals:

- Our global footprint, which is essential given that the fastest growing applications, such as mobility and upcoming 5G deployments, require ubiquitous, consistent network performance;
- Operating scale, with service delivery in over 200 countries and territories, which is important to new opportunities, such as connected car, machine-to-machine, land mobility and government, where service providers will look for global access. The ability to serve these applications on a global basis creates new satellite-based communication solutions with multi-billion dollar revenue potential;
- Our innovative technology, which is already in-orbit and gained further depth and resilience as we completed our current high-throughput investment program in 2018, together with our expertise in integrating this new technology into network solutions, providing our customers first-to-market advantage and experience; and
- Our portfolio of spectrum rights, which provides unmatched flexibility and agility as we look at new opportunities.

Our strategy is to seek revenue growth with the following actions:

- Drive stability in our core business, employing a disciplined yield management approach and emphasizing the development of strong distribution channels for our four primary customer sets of broadband, mobility, media and government;
- Scale our differentiated managed service offerings in targeted growth verticals in broadband, mobility, media and government, leveraging the global footprint, higher performance and better economics of our Intelsat Epic^{NG} fleet and the flexibility of our innovative terrestrial network; and
- Innovate through targeted investments and partnerships to develop a standards-based ecosystem that will provide a seamless interface with low earth orbit technologies and the broader telecommunications ecosystem.

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We believe that developing differentiated managed services and investing in related software- and standards-based technology will allow us to increase our relevance within the broader telecommunications landscape, unlocking opportunities that are essential to providing global broadband.

Our new services and technologies will also open new sectors that are much larger, and growing much faster, than the sectors we support today. Examples include:

- Providing network infrastructure for 2G/3G/4G/5G wireless in developing regions;
- Providing signal ubiquity in support of 5G services globally;
- Providing broadband connectivities that enable non-traditional telecommunications providers to deliver wi-fi services in underserved regions;
- Providing flexible broadband services for enterprise networks and for commercial and government-related aeronautical, maritime and other mobile applications, and using our high-throughput platform and global footprint to provide differentiated services;
- Optimizing content distribution networks that support UHD, OTT programming and other multiscreen viewing applications; and
- Providing ubiquitous broadband for global deployment of connected devices, such as the connected car, and the continuing formation of the IoT.

Our strategy with respect to capital investment and spectrum is expected to lead to longer-term outcomes, achieving the transformation of our business as we take the following actions:

- Lower overall capital intensity and improve cost effectiveness through innovation emphasis on software-defined infrastructure and encouraging a standards-based ecosystem built on widely adopted technologies, including the 3GPP standards. We will enhance our space and terrestrial infrastructure with platforms that are software defined and less expensive to manufacture resulting in faster deployments and mission flexibility; and
- Maximize the value of our spectrum rights, using strategic alliances to deliver on our market-based proposal to the U.S. Federal Communications Commission ("FCC") that addresses the need for mid-band spectrum in the U.S. to fuel adoption of 5G, while also protecting and maintaining the essential services we provide in the mid-band today.

In advancing our spectrum rights strategy, we have established the C-Band Alliance ("CBA") with the three other satellite operators providing C-band satellite services in the continental U.S. We are actively advocating for our proposal to the FCC under Docket No. 18-122.

The CBA is working with customer groups, associations and other stakeholders to provide detailed technical and operational plans that will enable safely clearing a portion of the band in a way that highly reliable C-band satellite services can continue. The CBA is also meeting with prospective parties interested in the cleared spectrum to ensure that the cleared spectrum meets their operational requirements for 5G services, with the goal of maximizing proceeds from a market-based transaction.

Competition

We compete in the communications market for the provision of video, data and voice connectivity worldwide. Communications services are provided using various communications technologies, including satellite networks, which provide services as a substitute for, or as a complement to, the capabilities of terrestrial networks. We also face competition from suppliers of terrestrial communications capacity.

We operate on a global scale. Our competition includes national, regional and global providers of traditional and high throughput FSS. We also compete with providers of MSS, or mobile satellite services, for broadband services delivered for aeronautical and maritime applications.

We also compete with providers of terrestrial fiber optic cable capacity on certain routes and networks, principally for point-to-point services. The primary use of fiber optic cable is carrying high-volume communications traffic from point to point, and fiber capacity is available at substantially lower prices than satellite capacity once operational.

Consequently, the growth in fiber optic cable capacity has led voice, data and video contribution customers that require service between major city hubs to migrate from satellite to fiber optic cable.

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In recent years, increased availability of fiber in metropolitan regions of developing countries, and the oversupply of satellite services in certain regions, have resulted in increased competition in some of the regions we serve. The effect of these two trends has been significant price reductions for both fiber and satellite connectivity, primarily impacting our commercial and government data applications. As a result, Intelsat's revenues have been reduced as services were terminated by customers moving to fiber alternatives, and also as contracts were renewed at lower prices. As of December 31, 2018, we identified approximately $150 million of contracted backlog that has not been renewed since January 1, 2015. As that business is renewed, we will adjust pricing to current market rates.

Sales, Marketing and Distribution Channels

We strive to maintain a close working relationship with our customers. Our primary sales and marketing operations are located in the United Kingdom and the United States. In addition, we have established local sales and marketing support offices in the following countries around the world:

- Australia
- Brazil
- China
- France
- Germany
- India
- Japan
- Kenya
- Russian Federation
- Senegal
- Singapore
- South Africa
- United Arab Emirates

By establishing local offices closer to our customers and staffing those offices with experienced personnel, we believe that we are able to provide flexible and responsive service and technical support to our customers. Our sales and marketing organization reflects our corporate focus on our three principal customer sets of network services, media and government. Our sales team includes technical marketing and sales engineering application expertise and a sales approach focused on creating integrated solutions for our customers' communications requirements.

We use a range of direct and wholesale distribution methods to sell our services, depending upon the region, the vertical application, regulatory requirements and customer application.

Our Network

Our global network is comprised of 54 satellites and ground facilities, including teleports, access to internet PoPs and leased fiber that support our commercial services and the operation and control of our satellites.

Our customers depend on our global communications network and our operational and engineering leadership. Highlights of our network include:

- Prime orbital locations, reflecting a valuable portfolio of coordinated fixed satellite spectrum rights;
- Highly reliable services, including transponder availability of 99.997% on all satellites for the year ended December 31, 2018;
- Flexibility to relocate satellites to other orbital locations as we manage fleet replacement, demand patterns change or in response to new customer requirements;
- Design features and steerable beams on many of our satellites that enable us to reconfigure capacity to provide different areas of coverage; and
- Resilience, with multiple satellites serving each region, allowing for improved restoration alternatives should a satellite anomaly occur.

As we design our new satellites, we work closely with our strategic customers to incorporate technology and service coverage that provide them with a cost-effective platform for their respective requirements.

The table below provides a summary of our satellite fleet as of December 31, 2018, except where noted.

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Satellite	Manufacturer	Orbital Location	Launch Date	Estimated End of Service Life [1]
Station Kept in Primary Orbital Role [2]:				
Galaxy 11	BSS [4]	44.9°E	Dec-99	Q4 2019
Intelsat 902	SSL [5]	62°E	Aug-01	Q4 2019
Intelsat 905	SSL	24.5°W	Jun-02	Q4 2019
Galaxy 3C	BSS	95.05°W	Jun-02	Q1 2023
Intelsat 906	SSL	64.15°E	Sep-02	Q3 2020
Intelsat 907	SSL	27.5°W	Feb-03	Q1 2020
Galaxy 23 [6]	SSL	121°W	Aug-03	Q1 2023
Galaxy 13/Horizons 1 [7]	BSS	127°W	Oct-03	Q2 2026
Intelsat 1002 [8]	Airbus	1°W	Jun-04	Q4 2021
Galaxy 28	SSL	89°W	Jun-05	Q3 2022
Galaxy 14	NGIS [9]	125°W	Aug-05	Q3 2021
Galaxy 15	NGIS	133°W	Oct-05	Q1 2024
Galaxy 16	SSL	99°W	Jun-06	Q1 2029
Galaxy 17	Thales [10]	91°W	May-07	Q1 2024
Intelsat 11	NGIS	42.99°W	Oct-07	Q4 2022
Horizons 2 [11]	NGIS	84.85°E	Dec-07	Q4 2024
Galaxy 18	SSL	123°W	May-08	Q2 2031
Intelsat 25	SSL	31.5°W	Jul-08	Q3 2024
Galaxy 19	SSL	97°W	Sep-08	Q2 2031
Intelsat 14	SSL	45°W	Nov-09	Q3 2027
Intelsat 15	NGIS	85.15°E	Nov-09	Q2 2027
Intelsat 16	NGIS	76.2°W	Feb-10	Q4 2035
Intelsat 17	SSL	66°E	Nov-10	Q2 2027
Intelsat 28 [12]	NGIS	32.8°E	Apr-11	Q3 2025
Intelsat 18	NGIS	180°E	Oct-11	Q4 2028
Intelsat 22 [13]	BSS	72.1°E	Mar-12	Q2 2028
Intelsat 19	SSL	166°E	Jun-12	Q2 2028
Intelsat 20	SSL	68.5°E	Aug-12	Q4 2036
Intelsat 21	BSS	58°W	Aug-12	Q3 2032
Intelsat 23	NGIS	53°W	Oct-12	Q2 2040
Intelsat 30	SSL	95.05°W	Oct-14	Q1 2036
Intelsat 34	SSL	55.5°W	Aug-15	Q1 2034
Intelsat 29e	BSS	50°W	Jan-16	Q2 2031
Intelsat 31	SSL	95.05°W	Jun-16	Q2 2037
Intelsat 36	SSL	68.5°E	Aug-16	Q1 2033
Intelsat 33e	BSS	60°E	Aug-16	Q1 2028

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Intelsat 35e	BSS	34.5°W	Jul-17	Q2 2037
Intelsat 37e	BSS	18°W	Sep-17	Q1 2030
Horizons 3e[14]	BSS	169.0°E	Sep-18	Q1 2047
Inclined Orbit:				
Intelsat 26	BSS	62.2°E	Feb-97	Q4 2019
Galaxy 25	SSL	93.1°W	May-97	Q3 2024
Intelsat 5	BSS	137°W	Aug-97	Q4 2024
Intelsat 805	LM [3]	169.1°E	Jun-98	Q1 2020
Intelsat 9	BSS	DRIFT	Jul-00	Q3 2019
Intelsat 12	SSL	45°E	Oct-00	Q4 2019
Intelsat 1R	BSS	157.1°E	Nov-00	Q2 2023
Intelsat 10	BSS	47.5°E	May-01	Q3 2026
Intelsat 901	SSL	29.5°W	Jun-01	Q3 2024
Intelsat 904	SSL	45.1°E	Feb-02	Q1 2025
Intelsat 903	SSL	31.5°W	Mar-02	Q4 2030
Galaxy 12	NGIS	129°W	Apr-03	Q2 2025
Payload Hosted on Third-Party Satellites:				
Intelsat 1W[15]	Thales	0.8°W	Oct-09	Q2 2029
Intelsat 32e[16]	Airbus	317.0°E	Feb-17	Q2 2034
Intelsat 38[17]	SSL	45.0°E	Sep-18	Q3 2041

(1) Engineering estimates of the service life as of December 31, 2018 as determined by remaining fuel levels, consumption rates and other considerations (including power) and assuming no relocation of the satellite. Such estimates are subject to change based upon a number of factors, including updated operating data from manufacturers.

(2) Primary orbital roles are those that are populated with station-kept satellites, generally, but not always, in their initial service positions, and where our general expectation is to provide continuity of service over the long-term.

(3) Lockheed Martin Corporation.

(4) Boeing Satellite Systems, Inc., formerly Hughes Aircraft Company.

(5) Space Systems/Loral, LLC (“SSL”).

(6) EchoStar Communications Corporation owns all of this satellite’s Ku-band transponders and a portion of the common elements of the satellite.

(7) Horizons Satellite Holdings, LLC (“Horizons Holdings”), our joint venture with JSAT International, Inc. (“JSAT”), owns and operates the Ku-band payload on this satellite. We are the exclusive owner of the C-band payload.

(8) Telenor owns 18 Ku-band transponders (measured in equivalent 36 MHz transponders) on this satellite. EADS Astrium was renamed AIRBUS Defence & Space.

(9) Northrop Grumman Innovation Systems ("NGIS").

(10) Thales Alenia Space.

(11) Horizons Holdings owns the payload on this satellite and we operate the payload for the joint venture.

(12) Intelsat 28 was formerly known as Intelsat New Dawn.

(13) Intelsat 22 includes a UHF payload owned by the Australian Defence Force.

(14) Horizons-3 Satellite LLC, our joint venture with JSAT, owns and operates this satellite. Horizons 3e entered into service in Q1 2019.

(15) Intelsat 1W refers to a Ku-band payload on Thor 6, a satellite operated by Telenor.

(16) Intelsat 32e refers to an HTS Ku-band payload we operate on a satellite also known as Sky Brasil 1.

(17) Intelsat 38 refers to a Ku-band payload on Azerspace-2, a satellite operated by Azercosmos. Intelsat 38 entered into service in Q1 2019.

Satellite Systems

There are three primary types of commercial communications satellite systems: low-earth orbit systems, medium-earth orbit systems and geosynchronous systems. All of our satellites are geosynchronous satellites and are located approximately 22,200 miles, or 35,800 kilometers, above the equator. These satellites can receive radio frequency communications from an origination point, relay those signals over great distances and distribute those signals to a single receiver or multiple receivers within the coverage areas of the satellites' transmission beams.

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Geosynchronous satellites send these signals using various parts of the radio frequency spectrum. The spectrum available for use at each orbital location includes the following frequency bands in which most commercial satellite services are offered today:

- C-band—low power, broad beams requiring use of relatively larger antennae, valued as spectrum least susceptible to transmission impairments such as rain;
- Ku-band—high power, narrow to medium size beams facilitating use of smaller antennae favored by businesses; and
- Ka-band—very high power, very narrow beams facilitating use of very small transmit/receive antennae, but somewhat less reliable due to high transmission weather-related impairments. The Ka-band is utilized for various applications, including consumer broadband services.

Substantially all of the station-kept satellites in our fleet are designed to provide capacity using the C- and/or Ku-bands of this spectrum.

A geosynchronous satellite is referred to as geostationary, or station-kept, when it is operated within an assigned orbital control, or station-keeping box, which is defined by a specific range of latitudes and longitudes. Geostationary satellites revolve around the earth with a speed that corresponds to that of the earth's rotation and appear to remain above a fixed point on the earth's surface at all times. Geosynchronous satellites that are not station-kept are in inclined orbit. The daily north-south motion of a satellite in inclined orbit exceeds the specified range of latitudes of its assigned station-keeping box, and the satellite appears to oscillate slowly, moving above and below the equator every day. An operator will typically operate a satellite in inclined orbit toward the end of its service life because the operator is able to save significant amounts of fuel by not controlling the north-south position of the satellite and is thereby able to substantially extend the service life of the satellite. The types of services and customers that can access an inclined orbit satellite have traditionally been limited due to the movement of the satellite relative to a fixed ground antenna. However, recent technology innovations now allow the use of inclined orbit capacity for certain applications. As a result, we anticipate demand for inclined orbit capacity may increase over the next few years if these applications are successfully introduced. As of December 31, 2018, 12 of our satellites were operating in an inclined orbit, with most continuing to earn revenue beyond our original estimated life for each of these satellites.

In-Orbit Satellites

We believe that our strong operational performance is due primarily to our satellite procurement and operations philosophy. Our operations and engineering staff is involved from the design through the decommissioning of each satellite that we procure. Our staff works at the manufacturers' and launchers' sites to monitor progress, allowing us to maintain close technical collaboration with our contractors during the process of designing, manufacturing and launching a satellite. We continue our engineering involvement throughout the operating lifetime of each satellite. Extensive monitoring of earth station operations, around-the-clock satellite control and network operations support ensure our consistent operational quality, as well as timely corrections when problems occur. In addition, we have in place contingency plans for technical problems that may occur during the lifetime of a satellite.

These features also contribute to the resilience of our network, which enables us to ensure the continuity of service that is important for our customers and to retain revenue in the event that we need to move customers to alternative capacity. The design flexibility of some of our satellites enables us to meet customer demand and respond to changing market conditions.

As of December 31, 2018, we had approximately 1,775 station-kept transponders, for which the average fill rate was 78%. The HTS Intelsat Epic^{NG} transponder unit count was approximately 1,150, reflecting an increase from 2017 as a result of the entry into service of Intelsat 37e.

The design life of a satellite is the length of time that the satellite's hardware is designed by the manufacturer to remain operational under normal operating conditions. In contrast, a satellite's orbital maneuver life is the length of time the satellite has enough fuel to remain operational. A satellite's service life is based upon fuel levels and other considerations, including power. Satellites launched in the recent past are generally expected to remain in service for the lesser of maneuver life and 16 years. Satellites typically have enough fuel to maintain between 16 and 18 years of

station-kept operations. The average remaining service life of our satellites was approximately 7.7 years as of December 31, 2018, weighted on the basis of nominally available capacity for the station-kept satellites we own.
Satellites on Order

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As of December 31, 2018, we had placed orders for the following two satellites. Generally, these satellites are being built over a period of three years.

Satellite	Manufacturer	Role	Earliest Launch Date	Expected Launch Provider
Intelsat 39	SSL	Large capacity satellite with a combination of C-band and Ku-band beams to be located at the 62°E, certain of which are customized for the digital inclusion requirements of an Asian nation	2019	Arianespace
Galaxy 30	NGIS	Next generation North American video distribution platform	2020	Arianespace

Future Satellites

We would expect to replace other existing satellites, as necessary, with satellites that meet customer needs and that have a compelling economic rationale. We periodically conduct evaluations to determine the current and projected strategic and economic value of our existing and any planned satellites and to guide us in redeploying satellite resources as appropriate.

Network Operations and Current Ground Facilities

We control and operate each of our satellites and manage the communications services for which each satellite is used from the time of its initial deployment through the end of its operational life, and we believe that our technical skill in performing these critical operations differentiates us from our competition. We provide most of these services from our satellite operations centers in McLean, Virginia and Long Beach, California, and our customer service center in Ellenwood, Georgia. In the event of a natural disaster or other situation disabling one of the facilities, each satellite operations center has the functional ability to provide instantaneous restoration of services on behalf of the other, demonstrating the efficiency and effectiveness of our network. Utilizing state of the art satellite command and control hardware and software, our satellite operations centers analyze telemetry from our satellites in order to monitor their status and track their location.

Our satellite operations centers use a network of ground facilities to perform their functions. This network includes 21 earth stations that provide tracking, telemetry and commanding ("TT&C") services for our satellites and various other earth stations worldwide. Through our ground facilities, we constantly monitor signal quality, protect bandwidth from piracy or other interference and maintain customer installed equipment.

Our customer service center located in Ellenwood, Georgia includes an RF Operations Center, a Managed Services Operations Center and an Intelsat Secured Operations Center. This facility is responsible for managing the communications services that we provide to our customers and is the first point of contact for customers needing assistance in using our network. We also maintain a back-up operations facility and data center a relatively short distance from our McLean, Virginia facility in Hagerstown, Maryland. This facility provides back-up emergency operational services in the event that our Ellenwood, Georgia customer service center experiences an interruption.

We have invested heavily in our fully integrated IntelsatOne® terrestrial network which complements our satellite network. Our network includes teleport, leased fiber and network performance monitoring systems and enables us to provide end-to-end managed solutions to our customers. In addition to leased fiber connecting high-density routes, our ground network also features strategically located PoPs, which are drop-off points for our customers' traffic that are close to major interconnection hubs for telecommunications applications, video transmissions and trunking to the internet backbone. Our terrestrial network is an all IP network environment that results in improved ground support of high bandwidth applications such as HD video. The network architecture allows us to converge our media and network services terrestrial network infrastructures, resulting in reduced costs, and provides opportunities for generating additional revenue from existing and new customers by bundling combinations of media and network services products that can be offered through a single access circuit into our network.

Capacity Sparing and Backup and General Satellite Risk Management

As part of our satellite risk management, we continually evaluate, and design plans to mitigate, the areas of greatest risk within our fleet, especially for those satellites with known technical risks. We believe that the availability of spare transponder services capacity, together with the overlapping coverage areas of our satellites and flexible satellite design features described in—Our Network—Satellite Systems above, are important aspects of our ability to provide reliable service to our customers. In addition, these factors could help us to mitigate the financial impact to our operations attributable to the occurrence of a major satellite anomaly, including the loss of a satellite. Although we do not maintain backup for all of our transponder services

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operating capacity, we generally maintain some form of backup capacity for each satellite designated as being in primary operating service. Our restoration backup capacity may include any one or more of the following:

- designated reserve transponders on the satellite or other on-board backup systems or designed-in redundancies,
- an in-orbit spare satellite, or
- interim restoration capacity on other satellites.

In addition, we provide some capacity on a preemptible basis and could preempt the use of this capacity to provide backup capacity in the event of a loss of a satellite.

We typically obtain launch insurance for our satellites before launch and will decide whether or not to obtain such insurance taking into consideration launch insurance rates, terms of available coverage and alternative risk management strategies, including the availability of backup satellites and transponders in the event of a launch failure. Launch insurance coverage is typically in an amount equal to the fully capitalized cost of the satellite, which generally includes the construction costs, the portion of the insurance premium related to launch, the cost of the launch services and capitalized interest (but may exclude any unpaid incentive payments to the manufacturer).

As of December 31, 2018, four of the satellites in our fleet were covered by in-orbit insurance. In-orbit insurance coverage may initially be for an amount comparable to launch insurance levels, generally decreases over time and is typically based on the declining book value of the satellite. We do not currently insure against lost revenue in the event of a total or partial loss of a satellite.

Satellite Health and Technology

Our satellite fleet is diversified by manufacturer and satellite type, and is generally healthy, with 99.997% transponder availability on all satellites during the year ended December 31, 2018. We have experienced some technical problems with our current fleet but have been able to minimize the impact of these problems on our customers, our operations and our business in recent years. Many of these problems have been component failures and anomalies that have had little long-term impact to date on the overall transponder availability in our satellite fleet. All of our satellites have been designed to accommodate an anticipated rate of equipment failures with adequate redundancy to meet or exceed their orbital design lives, and to date, this redundancy design scheme has proven effective. After each anomaly we have generally restored services for our customers on the affected satellite, provided alternative capacity on other satellites in our fleet, or provided capacity that we purchased from other satellite operators.

Significant Anomalies

On January 14, 2005, our Intelsat 804 satellite experienced a sudden and unexpected electrical power system anomaly that resulted in the total loss of the satellite. Intelsat 804 was a Lockheed Martin 7000 series (the “LM 7000 series”) satellite, and as of December 31, 2018 we operated one other satellite in the LM 7000 series, Intelsat 805. Based on the report of the Failure Review Board that we established with Lockheed Martin Corporation, we believe that the Intelsat 804 failure was not likely to have been caused by an Intelsat 804 specific workmanship or hardware element, but was most likely caused by a high current event in the battery circuitry triggered by an electrostatic discharge that propagated to cause the sudden failure of the high voltage power system. We therefore believe that although this risk exists for our other LM 7000 series satellite, the risk of any individual satellite having a similar anomaly is low.

On April 5, 2010, our Galaxy 15 satellite experienced an anomaly resulting in our inability to command the satellite. Galaxy 15 is a Star-2 satellite manufactured by Orbital Sciences Corporation. On December 23, 2010, we recovered command of the spacecraft and we have since uploaded flight software code to protect against future anomalies of this type. As of December 31, 2018, Galaxy 15 continues to provide normal service.

On April 22, 2011, our Intelsat 28 satellite, formerly known as the Intelsat New Dawn satellite, was launched into orbit. Subsequent to the launch, the satellite experienced an anomaly during the deployment of its west antenna reflector, which controls communications in the C-band frequency. The anomaly had not been experienced previously on other STAR satellites manufactured by Orbital Sciences Corporation, including those in our fleet. The New Dawn joint venture filed a partial loss claim with its insurers relating to the C-band antenna reflector anomaly and all of the insurance proceeds from the partial loss claim were received in 2011. The Ku-band antenna reflector deployed and that portion of the satellite is operating as planned, entering service in June 2011. A Failure Review Board established

to determine the cause of the anomaly, completed its investigation in July 2011 and concluded that the deployment anomaly of the C-band reflector was most likely due to a malfunction of the reflector sunshield. As a result, the sunshield interfered with the ejection release mechanism, and prevented the deployment of the C-band antenna. The Failure Review Board also recommended corrective actions for Orbital Sciences

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Corporation satellites not yet launched to prevent reoccurrence of the anomaly. Appropriate corrective actions were implemented on Intelsat 18, which was successfully launched on October 5, 2011, and on Intelsat 23, which was launched in October 2012.

During launch operations of Intelsat 19 on June 1, 2012, the satellite experienced damage to its south solar array. Although both solar arrays are deployed, the power available to the satellite is less than is required to operate 100% of the payload capacity. An Independent Oversight Board ("IOB") was formed by SSL and Sea Launch to investigate the solar array deployment anomaly. The IOB concluded that the anomaly occurred before the spacecraft separated from the launch vehicle, during the ascent phase of the launch, and originated in one of the satellite's two solar array wings due to a rare combination of factors in the panel fabrication and was unrelated to the launch vehicle. While the satellite is operational, the anomaly resulted in structural and electrical damage to one solar array wing, which reduced the amount of power available for payload operation. Additionally, we filed a partial loss claim with our insurers relating to the solar array anomaly. We received $84.8 million of insurance proceeds related to the claim in 2013. As planned, Intelsat 19 replaced Intelsat 8 at 166°E, in August 2012.

On February 1, 2013, the launch vehicle for our Intelsat 27 satellite failed shortly after liftoff and the satellite was completely destroyed. A Failure Review Board was established and subsequently concluded that the launch failed due to the mechanical failure of one of the first stage engine's thrust control components. The satellite and launch vehicle were fully insured, and we received $406.2 million of insurance proceeds in 2013.

During orbit raising of Intelsat 33e in September 2016, the satellite experienced a malfunction of the main satellite thruster. Orbit raising was subsequently completed using a different set of satellite thrusters. The anomaly resulted in a delay of approximately three months in reaching the geostationary orbit, as well as a reduction in the projected lifetime of the satellite. Intelsat 33e entered service in January 2017. In addition, in February 2017, measurements indicated higher than expected fuel use while performing stationkeeping maneuvers. There is no evidence of any impact to the communications payload. A Failure Review Board has completed investigation of the primary thruster failure and the fuel use anomaly. We filed a loss claim with our insurers in March 2017 relating to the reduction of life. As of December 31, 2018, we have settled with all insurers and received total collection and settlement payments of $70 million in cash.

Other Anomalies

We have also identified four other types of common anomalies among the satellite models in our fleet, which have had an operational impact in the past and could, if they materialize, have an impact in the future. These are:

- failure of the on-board SCP in Boeing 601 ("BSS 601") satellites;
- failure of the on-board XIPS used to maintain the in-orbit position of Boeing 601 High Power Series ("BSS 601 HP") satellites;
- accelerated solar array degradation in early Boeing 702 High Power Series ("BSS 702 HP") satellites; and
- failure of gyroscopes on certain SSL satellites.

SCP Failures. Many of our satellites use an on-board SCP to provide automatic on-board control of many operational functions. SCPs are a critical component in the operation of such satellites. Each such satellite has a backup SCP, which is available in the event of a failure of the primary SCP. Certain BSS 601 satellites have experienced SCP failures. The risk of SCP failure appears to decline as these satellites age.

As of December 31, 2018, we operated one BSS 601 satellite, Intelsat 26. This satellite was identified as having heightened susceptibility to the SCP problem. Intelsat 26 has been in continuous operation since 1997. Both primary and backup SCPs on this satellite are monitored regularly and remain fully functional. Accordingly, we believe it is unlikely that additional SCP failures will occur. Intelsat 26 is expected to be removed from its in-orbit position in 2019.

BSS 601 HP XIPS. The BSS 601 HP satellite uses XIPS as its primary propulsion system. There are two separate XIPS on each satellite, each one of which is capable of maintaining the satellite in its orbital position. The BSS 601 HP satellite also has a completely independent chemical propulsion system as a backup to the XIPS. As a result, the

failure of a XIPS on a BSS 601 HP satellite typically would have no effect on the satellite's performance or its operating life. However, the failure of both XIPS would require the use of the backup chemical propulsion system, which could result in a shorter operating life for the satellite depending on the amount of chemical fuel remaining. XIPS failures do not typically result in a catastrophic failure of the satellite or affect the communications capability of the satellite.

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As of December 31, 2018, we operated four BSS 601 HP satellites, Intelsat 5, Intelsat 9, and Intelsat 10, which are now in inclined orbit, and Galaxy 13/Horizons 1. Galaxy 13/Horizons 1 has one XIPS system available as its primary propulsion system. Intelsat 5, Intelsat 9 and Intelsat 10 have experienced the failure of both XIPS and are operating on their backup chemical propulsion systems. Intelsat 5 was redeployed in 2012 following its replacement by Intelsat 8, which was subsequently replaced by Intelsat 19. Also in 2012, Intelsat 9 and Intelsat 10 were redeployed following their replacements by Intelsat 21 and Intelsat 20, respectively. No assurance can be given that we will not have further XIPS failures that result in shortened satellite lives. We have decommissioned three satellites that had experienced failure of both XIPS. Intelsat 6B was replaced by Intelsat 11 during the first quarter of 2008, Galaxy 10R was replaced by Galaxy 18 during the second quarter of 2008, and Galaxy 4R was decommissioned in March 2009.

BSS 702 HP Solar Arrays. All of our satellites have solar arrays that power their operating systems and transponders and recharge the batteries used when solar power is not available. Solar array performance typically degrades over time in a predictable manner. Additional power margins and other operational flexibility are designed into satellites to allow for such degradation without loss of performance or operating life. Certain BSS 702 HP satellites have experienced greater than anticipated degradation of their solar arrays resulting from the design of the solar arrays. Such degradation, if continued, results in a shortened operating life of a satellite or the need to reduce the use of the communications payload.

As of December 31, 2018, we operated three BSS 702 HP satellites, two of which are affected by accelerated solar array degradation, Galaxy 11 and Intelsat 1R. Service to customers has not been affected, and we expect that both of these satellites will continue to serve customers until we replace or supplement them with new satellites. Along with the manufacturer, we continually monitor the problem to determine its cause and its expected effect. Due to this continued degradation, Galaxy 11 was redeployed following its replacement by Intelsat 34. Intelsat 1R was redeployed following its replacement by Intelsat 14. The third BSS 702 HP satellite that we operated as of December 31, 2018, Galaxy 3C, was launched after the solar array anomaly was identified, and it has a substantially different solar array design intended to eliminate the problem. This satellite has been in service since September 2002 and has not experienced similar degradation problems.

SSL gyroscopes. Some of our satellites use gyroscopes to provide 3-axes attitude information during orbit inclination maneuvers. Certain SSL satellites use gyroscopes that have been identified as having a higher probability of failing. There are four gyroscopes on each of these SSL satellites, three of which are needed for normal operation, and the fourth is a spare. The failure of a single gyroscope on a given satellite would have no effect on the satellite's performance or its operating life. A failure of two or more gyroscopes on a given satellite would require us to use an alternative method for inclination control. This alternative method would likely result in a reduction in the remaining life of the satellite. As of December 31, 2018, we operated 11 SSL satellites that use these gyroscopes, five of which are in inclined orbit. While in inclined orbit, inclination maneuvers are no longer required. The six satellites in station-kept orbit, are being operated through an alternative method for inclination control.

Regulation

As an operator of a privately owned global satellite system, we are subject to U.S. government regulation, regulation by foreign national telecommunications authorities and the ITU frequency coordination process and regulations.

U.S. Government Regulation

FCC Regulation. The majority of the satellites in our current constellation are licensed and regulated by the FCC. We have final or temporary FCC authorization for all of our U.S.-licensed operating satellites. The special temporary authorizations ("STAs") in effect relating to our satellites cover various time periods, and thus the number held at any given time varies. In some cases, we have sought STAs because we needed temporary operational authority while we are awaiting grant of identical permanent authority. In others, we sought STAs because the activity was temporary in nature, and thus no permanent authority was needed. Historically, we have been able to obtain the STAs that we have needed on a timely basis. FCC satellite licenses have a fifteen-year term. At the end of a license term, we can request an extension to continue operating a satellite. In addition, our FCC satellite licenses that relate to use of those orbital locations and associated frequencies that were transferred to the United States at the time of our privatization in

July 2001 are conditioned on our remaining a signatory to the Public Services Agreement with ITSO. Furthermore, any transfer of these licenses by us to a successor-in-interest is only permitted if such successor-in-interest has undertaken to perform our obligations under the Public Services Agreement. Some of our authorizations contain waivers of technical regulations. Many of our technical waivers were required when our satellites were initially licensed by the United States at privatization in 2001 because, as satellites previously operated by an intergovernmental entity, they had not been built in compliance with certain U.S. regulations. Since privatization, several replacement satellites for satellites licensed at privatization also have needed technical waivers as they are technically similar to the satellites they are replacing.

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Changes to our satellite system generally require prior FCC approval. From time to time, we have pending applications for permanent or temporary changes in orbital locations, frequencies and technical design. From time to time, we also file applications for replacement or additional satellites. Replacement satellite applications are eligible for streamlined processing if they seek authority for the same orbital location, frequency bands and coverage area as an existing satellite and will be brought into use at approximately the same time, but no later than, the existing satellite is retired. The FCC processes satellite applications for new orbital locations or frequencies on a first come, first served basis. The FCC requires licensees of new, non-replacement, geostationary satellites to post a bond and to comply with a milestone to launch and operate the satellite within five years of the license grant. The bond starts at $1 million and increases, pro rata, in proportion to the time that has elapsed since the license was granted to the time of the launch and operate milestone. At the end of the five-year period, the bond amount will be $3 million. A satellite licensee that does not satisfy the launch and operate milestone will lose its license and must forfeit the bond absent circumstances warranting a milestone extension under the FCC's rules and policies. An operator that elects to relinquish its license prior to the five-year launch and operate milestone will forfeit the amount of accrued bond as of the date the license is relinquished. We hold other FCC licenses, including earth station licenses associated with technical facilities located in several states and licenses for terminals. We must pay FCC filing fees in connection with our space station and earth station applications, and we must also pay annual regulatory fees to the FCC. Violations of the FCC's rules can result in various sanctions including fines, loss of authorizations or the denial of applications for new authorizations or the renewal of existing authorizations.

One of our subsidiaries holds a Section 214 authorization. However, we currently do not sell services as a common carrier. Therefore, we are not subject to rate regulation or the obligation not to discriminate among customers.

U.S. Export Control Requirements and Sanctions Regulation. Intelsat must comply with U.S. export control and trade sanctions laws and regulations as follows:

Under the Export Control Reform ("ECR") effort, authorized by Congress and the President, the control of commercial communications satellites along with their associated ground control equipment, related software, and technology was moved, effective November 10, 2014, from the International Traffic in Arms Regulations ("ITAR") to the Export Administration Regulations ("EAR"). Originally there was a two-year timeframe allowed for companies to make this change. This transition timeframe expired in November 2017. Intelsat has transitioned our export authorizations in response to the new regulatory licensing requirements created by this reform. Intelsat has moved all programs to EAR authorizations, as needed.

The Arms Export Control Act, implemented by ITAR and administered by the U.S. Department of State's Directorate of Defense Trade Controls ("DDTC"), regulates the export of certain satellites with defined military and government end use capabilities and characteristics, certain associated hardware, defense services, and technical information relating to satellites to non-U.S. persons (including satellite manufacturers, component suppliers, launch services providers, insurers, customers, Intelsat employees, and other non-U.S. persons). Intelsat has made the regulatory transition from the ITAR to the EAR, and a small portion of our controlled technology remains under ITAR. Intelsat does not currently have any active ITAR licenses. Standard satellite operations were de-controlled as part of the regulatory update, and that technology is now being exported without the need for authorization. Certain of Intelsat's contracts for consulting, manufacture, launch, and insurance of Intelsat's and third-party satellites involve the export to non-U.S. persons of technical data and/or hardware; these exports are those that were regulated by the ITAR are now controlled under the EAR, and have been transitioned to EAR authorizations. We believe that we do not currently need any ITAR authorizations to fulfill our obligations under contracts with non-U.S. entities.

The Export Administration Act/International Emergency Economic Powers Act, implemented by the EAR and administered by the U.S. Department of Commerce's Bureau of Industry and Security ("BIS"), regulates exports of non-ITAR, dual-use, controlled items, which as a result of ECR now includes commercial communications satellites, associated ground equipment, related software, and technology. The EAR also controls non-ITAR equipment exported to earth stations in our ground network located outside of the United States and to customers as needed. Intelsat uses EAR approved licensing exceptions for many of our export-controlled programs, and EAR licenses as required. It is

our practice to obtain all licenses necessary, or correctly document the license exception authorized, for the furnishing of original or spare equipment for the operation of our TT&C ground stations, other network stations, and customer locations in a timely manner to facilitate the shipment of this equipment when needed.

Trade sanctions laws and regulations administered by the U.S. Department of Treasury's Office of Foreign Assets Control ("OFAC") regulate the provision of services to certain countries subject to U.S. trade sanctions. As required, Intelsat holds the authorizations needed to provide satellite capacity and related administrative services to U.S.-sanctioned countries.

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U.S. Department of Defense Security Clearances. To participate in classified U.S. government programs, we entered into a proxy agreement with the U.S. government that allows one of our subsidiaries to obtain security clearances from the U.S. Department of Defense as required under the national security laws and regulations of the United States. Such a proxy agreement is required to insulate the subsidiary performing this work from inappropriate foreign influence and control by Intelsat S.A., a Luxembourg company with significant non-U.S. investments and employees. Security clearances are subject to ongoing scrutiny by the issuing agency, as well as renewal every five years. Intelsat must maintain the security clearances obtained from the U.S. Department of Defense, or else lose the ability to perform our obligations under any classified U.S. government contracts to which our subsidiary is a party. Under those circumstances, the U.S. government would have the right to terminate our contracts requiring access to classified information and we would not be able to enter into new classified contracts. Compliance with the proxy agreement is regularly monitored by the U.S. Department of Defense and reviewed at least annually, and if we materially violate the terms of the proxy agreement, the subsidiary holding the security clearances may be suspended or debarred from performing any U.S. government contracts, whether classified or unclassified. Our current proxy agreement is subject to extension every five years with the agreement of the U.S. Department of Defense.

Regulation by Non-U.S. National Telecommunications Authorities

U.K. Regulation. The United Kingdom is the licensing jurisdiction for the Intelsat 12 and Intelsat 26 satellites. Satellite operators in the United Kingdom are regulated by Ofcom and by the UKSA.

Papua New Guinea Regulation. NICTA regulates the use of certain spectrum and orbital resources associated with some of our satellites. Specifically, the following satellites were operated under the regulation of NICTA for all or part of, the year ended December 31, 2018: Galaxy 23, Intelsat 26, Intelsat 30, Intelsat 31, Intelsat 29e, Intelsat 33e, and Intelsat 36. We are required to pay annual fees to NICTA in connection with the spectrum and orbital resources utilized by these satellites, as well as for other satellite network filings we have the right to use. In 2003, the FCC added the C-band payload of the Galaxy 23 satellite, which is licensed by NICTA, to its “Permitted Space Station List,” enabling use of the payload to provide non-DTH services in the United States.

German Regulation. We hold licenses from the BNetzA for several earth stations in Germany, as well as authorizations to use spectrum and orbital resources associated with the operation of the Intelsat 10, Intelsat 12, Intelsat 38, Intelsat 904 and Galaxy 11 satellites and with future satellites. We are required to pay annual fees to BNetzA in connection with the spectrum and orbital resources utilized by these satellites, as well as for other satellite network filings we have the right to use.

Australian Regulation. We hold licenses from the Australian Communications and Media Authority (“ACMA”) for several earth stations in Australia, as well as a Nominated Carrier Declaration.

Japanese Regulation. We hold licenses from the Ministry of Internal Affairs and Communications for several earth stations in Japan, terminals, as well as Carrier registrations. We and JSAT are the sole members of Horizons Holdings, and in 2002 the Japanese telecommunications ministry authorized Horizons to operate the Ku-band payload on the Galaxy 13/Horizons 1 satellite. In 2003, the FCC added this Ku-band payload to its “Permitted Space Station List,” enabling Horizons to use the payload to provide non-DTH services in the United States. In May 2004, the FCC expanded this authority to include one-way DTH services. We are the exclusive owner of the C-band payload on Galaxy 13/Horizons 1, which the FCC has licensed us to operate.

Other National Telecommunications Authorities. As a provider of satellite capacity and services, we are also subject to the national communications and broadcasting laws and regulations of many other countries in which we operate. In addition, in some cases our ability to operate a satellite in a non-U.S. jurisdiction also arises from a contractual arrangement with a third party. Some countries require us to obtain a license or other form of written authorization from the regulator prior to offering satellite capacity services. We have obtained these licenses or written authorizations in all countries that have required us to obtain them. As satellites are launched or relocated, we determine whether such licenses or written authorizations are required and, if so, we obtain them. Most countries allow authorized telecommunications providers to own their own transmission facilities and to purchase satellite capacity without restriction, facilitating customer access to our services. Other countries maintain strict monopoly

regimes or otherwise regulate the provision of our services. In order to provide services in these countries, we may need to negotiate an operating agreement with a monopoly entity that covers the types of services to be offered by each party, the contractual terms for service and each party's rates. As we have developed our ground network and expanded our service offerings, we have been required to obtain additional licenses and authorizations. To date, we believe that we have identified and complied with all of the regulatory requirements applicable to us in connection with our ground network and expanded services.

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The International Telecommunication Union Frequency Coordination Process and Associated Regulations

Our use of orbital locations is subject to the frequency coordination and recording process of the ITU. In order to protect satellite networks from harmful radio frequency interference from other satellite networks, the ITU maintains a Master International Frequency Register ("MIFR") of radio frequency assignments and their associated orbital locations. Each ITU notifying administration is required by treaty to give notice of, coordinate and record its proposed use of radio frequency assignments and associated orbital locations with the ITU's Radiocommunication Bureau.

When a frequency assignment is recorded in the MIFR, the ITU publishes this information so that all potential users of frequencies and orbital locations are aware of the need to protect the recorded assignments associated with a given orbital location from subsequent or nonconforming interfering uses by Member States of the ITU. The ITU's Radio Regulations do not contain mandatory dispute resolution or enforcement mechanisms. The Radio Regulations' arbitration procedure is voluntary and neither the ITU specifically, nor international law generally, provides clear remedies if this voluntary process fails. Only nation states have full standing as ITU members. Therefore, we must rely on governments to represent our interests before the ITU, including obtaining new rights to use orbital locations and resolving disputes relating to the ITU's regulations.

An operator may submit an ITU satellite network filing to the FCC for forwarding to the ITU prior to the operator filing a complete FCC license application. Submission of such an ITU filing will reserve for the operator a place in the FCC's first come, first served licensing queue provided the operator posts a $500,000 bond. If the operator fails within two years to file a complete FCC license application for the orbital location, frequencies and polarization proposed in the ITU satellite network filing, the bond will be forfeited.

Environmental Matters

Our operations are subject to various laws and regulations relating to the protection of the environment, including those governing the management, storage and disposal of hazardous materials and the cleanup of contamination. As an owner or operator of property and in connection with current and historical operations at some of our sites, we could incur significant costs, including cleanup costs, fines, sanctions and third-party claims, as a result of violations of or liabilities under environmental laws and regulations. For instance, some of our operations require continuous power supply, and, as a result, current and past operations at our teleports and other technical facilities include fuel storage and batteries for back-up power generators. We believe, however, that our operations are in substantial compliance with environmental laws and regulations.

C. Organizational Structure

Intelsat S.A. is a holding company with 53 subsidiaries incorporated in the U.S., Luxembourg, Bermuda, Australia, Brazil, China, Hong Kong, Cayman Islands, France, Germany, Gibraltar, India, Ireland, Mexico, the Russian Federation, Singapore, South Africa, and the United Kingdom as of December 31, 2018. All of the aforementioned subsidiaries are wholly-owned by us. A list of our significant subsidiaries as of December 31, 2018 is set forth in Exhibit 8.1 to this Annual Report.

D. Property, Plant and Equipment

We lease approximately 217,650 square feet of office space in McLean, Virginia for our U.S. administrative headquarters and primary satellite operations center. The building also houses the majority of our sales and marketing support staff and other administrative personnel. The lease for the building expires on July 31, 2029.

We own a facility in Ellenwood, Georgia in which our primary customer service center is located, together with our Atlanta Teleport. The facility has approximately 130,000 square feet of office space and operations facilities, which are based in two buildings and multiple antenna shelters and 68 antennas on the property. See Item 4B—Business Overview—Our Network—Network Operations and Current Ground Facilities for a description of this facility.

Our backup satellite operations center is located at a facility that we own in Long Beach, California, which includes approximately 68,875 square feet for administrative and operational facilities. We have entered into two lease agreements for 20,900 square feet with two third-party tenants.

We use a worldwide terrestrial ground network to operate our satellite fleet and to manage the communications services that we provide to our customers. This network is comprised of 65 owned and leased earth station and teleport facilities around the world, including 21 teleports that allows us to perform TT&C services.

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The eight teleports in our terrestrial ground network that we own are located in Hagerstown, Maryland, Ellenwood, Georgia, Castle Rock, Colorado, Fillmore, Napa and Riverside, California, Paumalu, Hawaii and Fuchsstadt, Germany. We lease facilities at 57 other locations for satellite and commercial operations worldwide. We also contract with the owners of some of these facilities for the provision of additional services. The locations of other earth stations in our ground network include Argentina, Australia, Bahrain, Brazil, Canada, Chile, Colombia, Germany, India, Italy, Kazakhstan, Kenya, Mongolia, the Netherlands, New Zealand, Nigeria, Norway, Peru, South Korea, South Africa, Taiwan, the United Arab Emirates, and the United States. Our network also consists of the leased communications links that connect the earth stations to our satellite operations center located at our McLean, Virginia location and to our back-up operations facility.

We have established PoPs connected by leased fiber at key traffic exchange points around the world, including Atlanta, Los Angeles, New York, McLean, Miami, Palo Alto and London. We lease our facilities at these traffic exchange points. We have also established video PoPs connected by leased fiber at key video exchange points around the world, including Johannesburg, Los Angeles, Denver, New York, Washington, D.C., Miami and London. We lease our facilities at these video exchange points. We use our teleports and PoPs in combination with our satellite network to provide our customers with managed data and video services.

We lease office space in Luxembourg and London, England. Our Luxembourg office serves as the global headquarters for us and our Luxembourg parents and subsidiaries. Our London office houses the employees of Intelsat Global Sales and Marketing Ltd., our sales and marketing subsidiary, and administrative support, and functions as our global sales headquarters.

We also lease office space in Florida, Australia, Brazil, China, France, Germany, India, Japan, Kenya, Mexico, the Russian Federation, Singapore, South Africa, Senegal and the United Arab Emirates for our local sales and marketing and administrative support offices.

The leases relating to our TT&C earth stations, teleports, PoPs and office space expire at various times. We do not believe that any such properties are individually material to our business or operations, and we expect that we could find suitable properties to replace such locations if the leases were not renewed at the end of their respective terms.

Item 4A. Unresolved Staff Comments

Not applicable.

Item 5. Operating and Financial Review and Prospects

This discussion should be read together with Item 3A—Selected Financial Data and our consolidated financial statements and their notes included elsewhere in this Annual Report. Our consolidated financial statements are prepared in accordance with accounting principles generally accepted in the United States, or U.S. GAAP, and, unless otherwise indicated, the other financial information contained in this Annual Report has also been prepared in accordance with U.S. GAAP. See “Forward-Looking Statements” and Item 3D—Risk Factors, for a discussion of factors that could cause our future financial condition and results of operations to be different from those discussed below.

Certain monetary amounts, percentages and other figures included in this Annual Report have been subject to rounding adjustments. Accordingly, figures shown as totals in certain tables may not be the arithmetic aggregation of the figures that precede them, and figures expressed as percentages in the text may not total 100% or, as applicable, when aggregated may not be the arithmetic aggregation of the percentages that precede them. Unless otherwise indicated, all references to “dollars” and “$” in this Annual Report are to, and all monetary amounts in this Annual Report are presented in, U.S. dollars.

Overview

We operate one of the world’s largest satellite services businesses, providing a critical layer in the global communications infrastructure.

We provide diversified communications services to the world’s leading media companies, fixed and wireless telecommunications operators, data networking service providers for enterprise and mobile applications in the air and

on the seas, multinational corporations and ISPs. We are also the leading provider of commercial satellite capacity to the U.S. government and other select military organizations and their contractors.

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Our customers use our Global Network for a broad range of applications, from global distribution of content for media companies to providing the transmission layer for commercial aeronautical consumer broadband connectivity, to enabling essential network backbones for telecommunications providers in high-growth emerging regions.

Our network solutions are a critical component of our customers' infrastructures and business models. Generally, our customers need the specialized connectivity that satellites provide so long as they are in business or pursuing their mission. In recent years, mobility services providers have contracted for services on our fleet that support broadband connections for passengers on commercial flights and cruise ships, connectivity that in some cases is only available through our network. In addition, our satellite neighborhoods provide our media customers with efficient and reliable broadcast distribution that maximizes audience reach, a technical and economic benefit that is difficult for terrestrial services to match. In developing regions, our satellite solutions often provide higher reliability than is available from local terrestrial telecommunications services and allow our customers to reach geographies that they would otherwise be unable to serve.

Critical Accounting Policies

The preparation of financial statements in accordance with U.S. GAAP requires management to make estimates and assumptions that affect reported amounts and related disclosures. We consider an accounting estimate to be critical if: (1) it requires assumptions to be made that were uncertain at the time the estimate was made; and (2) changes in the estimate, or selection of different estimates, could have a material effect on our consolidated results of operations or financial condition.

We believe that some of the more important estimates and related assumptions that affect our financial condition and results of operations are in the areas of revenue recognition, the allowance for doubtful accounts, asset impairments, income taxes and pension and other postretirement benefits.

In January 2018, we adopted the Accounting Standard Update ("ASU") 2014-09, Revenue from Contracts with Customers (Topic 606) using the modified retrospective method. We recognized the cumulative effect of initially applying the new standard as an adjustment to the opening balance of accumulated deficit. The comparative information has not been restated and continues to be reported under the accounting standards in effect for those periods. Based on our assessment, the adoption of the new standard impacts the total consideration for prepayment contracts, accounting of incremental costs for obtaining a contract, allocation of the transaction price to performance obligations and accounting for contract modifications, and requires additional disclosures.

While we believe that our estimates, assumptions, and judgments are reasonable, they are based on information presently available. Actual results may differ significantly. Additionally, changes in our assumptions, estimates or assessments as a result of unforeseen events or otherwise could have a material impact on our financial position or results of operations.

Revenue Recognition, Accounts Receivable and Allowance for Doubtful Accounts

Revenue Recognition. We earn revenue primarily from satellite utilization services and, to a lesser extent, from providing managed services to our customers. The Company's contracts for satellite utilization services often contain multiple service orders for the provision of capacity on or over different beams, satellites, frequencies, geographies or time periods. Under each separate service order, the Company's satellite services, comprised of transponder services, managed services, channel services, and occasional use managed services, are delivered in a series of time periods that are distinct from each other and have the same pattern of transfer to the customer. In each period, the Company's obligation is to make those services available to the customer. Throughout each period of services being provided, the customer simultaneously receives and consumes the benefits, resulting in revenue recognition over time. Our contract assets include unbilled amounts typically resulting from sales under our long-term contracts when the total contract value is recognized on a straight-line basis and the revenue recognized exceeds the amount billed to the customer. Contract liabilities consist of advance payments and collections in excess of revenue recognized and deferred revenue. While the majority of our revenue transactions contain standard business terms and conditions, there are certain transactions that contain non-standard business terms and conditions. As a result, significant contract interpretation is sometimes required to determine the appropriate accounting for these transactions, including but not limited to:

- whether contracts with a prepayment contain a significant financing component;
- whether an arrangement should be reported gross as a principal versus net as an agent; and
- whether an arrangement contains a service contract or a lease.

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In addition, our revenue recognition policy requires an assessment as to whether collection is reasonably assured, which requires us to evaluate the creditworthiness of our customers. Changes in judgments in making these assumptions and estimates could materially impact the timing and/or amount of revenue recognition.

Allowance for Doubtful Accounts. Our allowance for doubtful accounts is determined through a subjective evaluation of the aging of our accounts receivable, and considers such factors as the likelihood of collection based upon an evaluation of the customer's creditworthiness, the customer's payment history and other conditions or circumstances that may affect the likelihood of payment, such as political and economic conditions in the country in which the customer is located. If our estimate of the likelihood of collection is not accurate, we may experience lower revenue or a change in our provision for doubtful accounts.

Asset Impairment Assessments

Goodwill. We account for goodwill and other intangible assets in accordance with Financial Accounting Standards Board ("FASB") Accounting Standards Codification ("ASC" or the "Codification") Topic 350—Intangibles—Goodwill and Other. Under this topic, goodwill acquired in a business combination and determined to have an indefinite useful life is not amortized but is tested for impairment annually or more often if an event or circumstances indicate that an impairment loss has been incurred. We are required to identify reporting units for impairment analysis. We have identified only one reporting unit for the goodwill impairment test. Additionally, our identifiable intangible assets with estimable useful lives are amortized based on the expected pattern of consumption for each respective asset.

Assumptions and Approach Used. We make our qualitative evaluation considering, among other things, general macroeconomic conditions, industry and market considerations, cost factors, overall financial performance and other relevant entity-specific events.

At December 31, 2017, we reassessed the different qualitative factors and updated our assessment. Based on our review, since the fixed and mobile satellite services industry was under pressure (pricing over-supply, value-chain inefficiencies) and since comparable companies had demonstrated negative to minimal revenue growth with equities underperforming, we determined that a quantitative assessment of goodwill was appropriate. Based on our quantitative analysis, we concluded that there was no impairment for goodwill at December 31, 2017.

Based on our qualitative assessment performed at December 31, 2018, we concluded that there was not a likelihood of more than 50% that the fair value of our reporting unit was less than its carrying value; therefore, no further testing of goodwill was required.

Orbital Locations and Trade Name. Intelsat is authorized by governments to operate satellites at certain orbital locations—i.e., longitudinal coordinates along the Clarke Belt. The Clarke Belt is the part of space approximately 35,800 kilometers above the plane of the equator where geostationary orbit may be achieved. Various governments acquire rights to these orbital locations through filings made with the ITU, a sub-organization of the United Nations. We will continue to have rights to operate satellites at our orbital locations so long as we maintain our authorizations to do so. See "Part I—Item 3D—Risk Factors—Risk Factors Relating to Regulation".

Our rights to operate at orbital locations can be used and sold individually; however, since satellites and customers can be and are moved from one orbital location to another, our rights are used in conjunction with each other as a network that can be adapted to meet the changing needs of our customers and market demands. Due to the interchangeable nature of orbital locations, the aggregate value of all of the orbital locations is used to measure the extent of impairment, if any.

At December 31, 2017 and 2018, we determined, based on an examination of qualitative factors, that there was no impairment of our orbital locations and trade name.

Long-Lived and Amortizable Intangible Assets. We review our long-lived and amortizable intangible assets to assess whether an impairment has occurred in accordance with the guidance provided under FASB ASC Topic 360—Property, Plant and Equipment, whenever events or changes in circumstances indicate, in our judgment, that the carrying amount of an asset may not be recoverable. These indicators of impairment can include, but are not limited to, the following:

- satellite anomalies, such as a partial or full loss of power;
- under-performance of an asset as compared to expectations; and
- shortened useful lives due to changes in the way an asset is used or expected to be used.

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The recoverability of an asset to be held and used is measured by a comparison of the carrying amount of the asset to the estimated undiscounted future cash flows expected to be generated by the asset. If the carrying amount of the asset exceeds its estimated undiscounted future cash flows, an impairment charge is recognized in the amount by which the carrying amount of the asset exceeds its fair value, determined by either a quoted market price, if any, or a value determined by utilizing discounted cash flow techniques. Additionally, when assets are expected to be used in future periods, a shortened depreciable life may be utilized if appropriate, resulting in accelerated depreciation.

Assumptions and Approach Used. We employ a discounted future cash flow approach to estimate the fair value of our long lived intangible assets when an impairment assessment is required.

Income Taxes

We account for income taxes in accordance with the guidance provided under the Income Taxes topic of the Codification ("FASB ASC 740"). We are subject to income taxes in Luxembourg as well as a number of foreign jurisdictions, including the United States. Significant judgment is required in the calculation of our tax provision and the resultant tax liabilities and in the recoverability of our deferred tax assets that arise from temporary differences between the tax and financial statement recognition of revenue and expense and net operating loss and credit carryforwards.

We regularly assess the likelihood that our deferred tax assets can be recovered. A valuation allowance is required when it is more likely than not that all or a portion of the deferred tax asset will not be realized. We evaluate the recoverability of our deferred tax assets based in part on the existence of deferred tax liabilities that can be used to realize the deferred tax assets.

During the ordinary course of business, there are many transactions and calculations for which the ultimate tax determination is uncertain. We evaluate our tax positions to determine if it is more likely than not that a tax position is sustainable, based solely on its technical merits and presuming the taxing authorities have full knowledge of the position, and access to all relevant facts and information. When a tax position does not meet the more likely than not standard, we record a liability for the entire amount of the unrecognized tax impact. Additionally, for those tax positions that are determined more likely than not to be sustainable, we measure the tax position at the largest amount of benefit more likely than not (determined by cumulative probability) to be realized upon settlement with the taxing authority.

Pension and Other Postretirement Benefits

We maintain a noncontributory defined benefit retirement plan covering substantially all of our employees hired prior to July 19, 2001. The cost of providing benefits to eligible participants under the defined benefit retirement plan is calculated using the plan's benefit formulas, which take into account the participants' remuneration, dates of hire, years of eligible service, and certain actuarial assumptions. In addition, as part of the overall medical plan, we provide postretirement medical benefits to certain current retirees who meet the criteria under the medical plan for postretirement benefit eligibility.

Expenses for our defined benefit retirement plan and for postretirement medical benefits that are provided under our medical plan are developed from actuarial valuations. Any significant decline in the fair value of our defined benefit retirement plan assets or other adverse changes to the significant assumptions used to determine the plan's funded status would negatively impact its funded status and could result in increased funding in future periods.

Key assumptions, including discount rates used in determining the present value of future benefit payments and expected return on plan assets, are reviewed and updated on an annual basis. The discount rates reflect market rates for high-quality corporate bonds. We consider current market conditions, including changes in interest rates, in making assumptions. The Society of Actuaries ("SOA") issued new mortality and mortality improvement tables and modified those tables in 2016, 2017 and 2018. Our December 31, 2018 valuation used mortality and improvement tables based on the SOA tables, adjusted to reflect (1) an ultimate rate of mortality improvement consistent with both historical experience and U.S. Social Security long-term projections, and (2) a shorter transition period to reach the ultimate rate, which is consistent with historical patterns. In establishing the expected return on assets assumption, we review the asset allocations considering plan maturity and develop return assumptions based on different asset classes.

The return assumptions are established after reviewing historical returns of broader market indexes, as well as historical performance of the investments in the plan.

Recently Issued Accounting Pronouncements

In February 2016, the FASB issued ASU 2016-02, Leases (Topic 842), to increase transparency and comparability by recognizing substantially all leases on the balance sheet. Under the new standard, a lessee will recognize on its balance sheet a

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lease liability and a right-of-use ("ROU") asset for most leases, with certain practical expedients available. ASU 2016-02 is effective for interim and annual periods beginning after December 15, 2018. Subsequent to ASU 2016-02, the FASB issued ASU 2018-10 Codification Improvements to Topic 842, Leases, ASU 2018-11 Targeted Improvements, and ASU 2018-20 Narrow-Scope Improvements for Lessors, which amend and clarify aspects of the guidance issued in ASU 2016-02. ASU 2018-11 provides an alternative transition method (the "effective date method"). We intend to adopt ASU 2016-02 on January 1, 2019 and apply the package of practical expedients included therein, as well as utilize the effective date method included in ASU 2018-11. Under the package of practical expedients, we will not reassess (a) whether expired or existing contracts contain a lease under the new definition of a lease, (b) lease classification for expired or existing leases, and (c) whether previously capitalized initial direct costs would qualify for capitalization under Topic 842. We also intend to apply the practical expedients for lessees and lessors to exempt short term leases and to account for each non lease component associated with a lease component as a single component when the applicable criteria are met. By applying ASU 2016-02 at the adoption date, as opposed to at the beginning of the earliest period presented, our reporting for periods prior to January 1, 2019 will continue to be in accordance with Leases (Topic 840). In preparation for adoption of the standard, we have implemented internal controls and key system functionality to enable the preparation of the necessary financial information.

The new standard will have a material impact on our consolidated balance sheets, and we expect to recognize ROU assets and related lease liabilities for operating leases in the range of $85.0 million to $95.0 million, and $110.0 million to $120.0 million, respectively, with no material impact on our consolidated statement of operations and statement of cash flows. The new standard may have lessor accounting implications where certain future contracts that convey the right to control the use of a significant portion of the satellite may be accounted for using an approach that is substantially equivalent to existing guidance for sales-type leases, direct financing leases and operating leases, which could potentially result in more upfront revenue recognition.

In June 2016, the FASB issued ASU 2016-13, Financial Instruments-Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments, which changes how companies measure and recognize credit impairment for any financial assets. The standard requires companies to immediately recognize an estimate of credit losses expected to occur over the remaining life of the financial assets that are within the scope of the standard. The scope of Subtopic 326-20, Financial Instruments - Credit Losses - Measured at Amortized Cost, includes financial assets measured at amortized cost basis, including net investments in leases arising from sales-type and direct financing leases. The scope does not specifically address receivables arising from operating leases. In November 2018, the FASB issued 2018-19, Codification Improvements to Topic 326, Financial Instruments—Credit Losses to clarify that receivables arising from operating leases are not within the scope of Subtopic 326-20. Instead, impairment of receivables arising from operating leases should be accounted for in accordance with Topic 842, Leases. Both ASU 2016-13 and ASU 2018-19 are effective for interim and annual periods beginning after December 15, 2019 for public business entities that are SEC filers, on a modified retrospective basis. Early adoption is permitted for interim and annual periods beginning after December 15, 2018. We are in the process of evaluating the impact that ASU 2016-13 and ASU 2018-19 will have on our consolidated financial statements and associated disclosures.

In January 2017, the FASB issued ASU 2017-04, Intangibles-Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment, which is intended to simplify the subsequent measurement of goodwill. The amendments in ASU 2017-04 modify the concept of impairment from the condition that exists when the carrying amount of goodwill exceeds its fair value to the condition that exists when the carrying amount of a reporting unit exceeds its fair value. An entity will no longer determine goodwill impairment by calculating the implied fair value of goodwill by assigning the fair value of a reporting unit to all of its assets and liabilities, as if that reporting unit had been acquired in a business combination. ASU 2017-04 will be effective for interim and annual goodwill impairment tests in fiscal years beginning after December 15, 2019 for public business entities, on a prospective basis. Early adoption is permitted for interim or annual goodwill impairment tests performed on testing dates after January 1, 2017. When adopted, we will measure impairment using the difference between the carrying amount and the fair value of the reporting unit, if required.

In February 2018, the FASB issued ASU 2018-02, Income Statement - Reporting Comprehensive Income (Topic 220), which allows for an optional reclassification from accumulated other comprehensive income to retained earnings for stranded tax effects resulting from the Tax Cuts and Jobs Act. Consequently, the amendments eliminate the stranded tax effects resulting from the Tax Cuts and Jobs Act for those entities that elect the optional reclassification. The amendments in this update will also require certain disclosures about stranded tax effects. ASU 2018-02 is effective for all entities for interim and annual periods beginning after December 15, 2018. The adoption of ASU 2018-02 is not expected to have a significant impact on our consolidated financial statements and associated disclosures.

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In August 2018, the FASB issued ASU 2018-13, Fair Value Measurement (Topic 820), as part of its disclosure framework project to improve the effectiveness of disclosures in the notes to financial statements. ASU 2018-13 modifies disclosure requirements on fair value measurements in Topic 820, and is effective for all entities for interim and annual periods beginning after December 15, 2019. The amendments on changes in unrealized gains and losses, the range and weighted average of significant unobservable inputs used to develop Level 3 fair value measurements, and the narrative description of measurement uncertainty should be applied prospectively for only the most recent interim or annual period presented in the initial fiscal year of adoption. All other amendments should be applied retrospectively to all periods presented upon their effective date. Early adoption is allowed for any removed or modified disclosures upon issuance of ASU 2018-13 and delay adoption for the additional disclosures until their effective date. We are in the process of evaluating the impact that ASU 2018-13 will have on our consolidated financial statements and associated disclosures.

In August 2018, the FASB issued ASU 2018-14, Compensation - Retirement Benefits - Defined Benefit Plans - General (Subtopic 715-20), as part of its disclosure framework project to improve the effectiveness of disclosures in the notes to financial statements. ASU 2018-14 modifies and clarifies disclosure requirements for employers that sponsor defined benefit pension or other postretirement plans. The amendments remove certain disclosure requirements and require additional disclosures including the weighted-average interest crediting rates for cash balance plans and other plans with promised interest crediting rates, an explanation of the reasons for significant gains and losses related to changes in the benefit obligation for the period, the projected benefit obligation "PBO" and fair value of plan assets for plans with PBOs in excess of plan assets, and the accumulated benefit obligation "ABO" and fair value of plan assets for plans with ABOs in excess of plan assets. ASU 2018-14 is effective for public business entities for fiscal years ending after December 15, 2020, on a retrospective basis to all periods presented with early adoption allowed. We are in the process of evaluating the impact that ASU 2018-14 will have on our consolidated financial statements and associated disclosures.

In August 2018, the FASB issued ASU 2018-15, Intangibles - Goodwill and Other Internal-Use Software (Subtopic 350-40), to improve current U.S. GAAP by clarifying the accounting for implementation costs of a hosting arrangement that is a service contract. The amendments align the requirements for capitalizing implementation costs incurred in a cloud computing arrangement (hosting arrangement) that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software (and hosting arrangements that include an internal-use software license). The amendments require costs for implementation activities in the application development stage to be capitalized depending on the nature of the costs, and costs incurred during the preliminary project and post-implementation stages to be expensed as the activities are performed. ASU 2018-15 also requires the entity (customer) to expense capitalized implementation costs of a hosting arrangement that is a service contract over the term of the hosting arrangement, and the entity (customer) to present the expense related to the capitalized implementation costs in the same line item in the statement of income as the fees associated with the hosting element (service) of the arrangement, as well as to classify payments for capitalized implementation costs in the statement of cash flows in the same manner as payments made for fees associated with the hosting element. ASU 2018-15 is effective for public business entities for fiscal years beginning after December 15, 2019, and interim periods within those fiscal years. ASU 2018-15 can be applied either retrospectively or prospectively to all implementation costs incurred after the date of adoption, with early adoption allowed. We are in the process of evaluating the impact that ASU 2018-15 will have on our consolidated financial statements and associated disclosures.

In November 2018, the FASB issued ASU 2018-18, Collaborative Arrangements (Topic 808) - Clarifying the Interaction between Topic 808 and Topic 606, to clarify the interaction between Topic 808, Collaborative Arrangements and Topic 606, Revenue from Contracts with Customers. ASU 2018-18 is effective for public business entities for fiscal years beginning after December 15, 2019, and interim periods within those fiscal years, with early adoption allowed. ASU 2018-18 can be applied retrospectively to the date of initial application of Topic 606, with cumulative effect of initially applying the amendments in this update adjusted to the opening balance of retained earnings of the later of the earliest annual period presented and the annual period that includes the date of the entity's

initial application of Topic 606. The amendments in ASU 2018-18 can be applied to all contracts or only to contracts that are not completed at the date of initial application of Topic 606. We are in the process of evaluating the impact that ASU 2018-18 will have on our consolidated financial statements and associated disclosures.

Revenue

Revenue Overview

We earn revenue primarily by providing services over satellite transponder capacity to our customers. Our customers generally obtain satellite capacity from us by placing an order pursuant to one of several master customer service agreements. The master customer agreements and related service orders under which we sell services specify, among other things, the amount of satellite capacity to be provided, whether service will be non-preemptible or preemptible and the service term. Most

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services are full time in nature, with service terms ranging from one year to as long as 16 years. Occasional use services used for video applications can be for much shorter periods, including increments of one hour. Our master customer service agreements offer different service types, including transponder services, managed services, and channel, which are all services that are provided on, or used to provide access to, our global network. We refer to these services as on-network services. Our customer agreements also cover services that we procure from third parties and resell, which we refer to as off-network services. These services can include transponder services and other satellite-based transmission services sourced from other operators, often in frequencies not available on our network, and other operational fees related to satellite operations provided on behalf of third-party satellites. The following table describes our primary service types:

Service Type	Description
On-Network Revenues:	
Transponder Services	Commitments by customers to receive service via, or to utilize capacity on, particular designated transponders according to specified technical and commercial terms. Transponder services also include revenues from hosted payload capacity. Transponder services are marketed to each of our primary customer sets as follows: •Network Services: fixed and wireless telecom operators, data network operators, enterprise operators of private data networks, and value-added network operators for fixed and mobile broadband network infrastructure. •Media: broadcasters (for distribution of programming and full time contribution, or gathering, of content), programmers and DTH operators. •Government: civilian and defense organizations, for use in implementing private fixed and mobile networks, or for the provision of capacity or capabilities through hosted payloads.
Managed Services	Hybrid services primarily using IntelsatOne®, including our IntelsatOne® Flex broadband platform, which combine satellite capacity, teleport facilities, satellite communications hardware such as broadband hubs or video multiplexers and fiber optic cable and other ground facilities to provide managed and monitored broadband, trunking, video and private network services to customers. Managed services are marketed to each of our customer sets as follows: •Network Services: enterprises, cellular operators and fixed and mobile value-added service providers which deliver end-services such as private data networks, wireless infrastructure and maritime and aeronautical broadband. •Media: programmers outsourcing elements of their transmission infrastructure and part time occasional use services used primarily by news and sports organizations to gather content from remote locations. •Government: users seeking secured, integrated, end-to-end solutions.
Channel	Standardized services of predetermined bandwidth and technical characteristics primarily used for point-to-point bilateral services for telecommunications providers. Channel is not considered a core service offering due to changing market requirements and the

	proliferation of fiber alternatives for point-to-point customer applications. Channel services are exclusively marketed to traditional telecommunications providers in our network services customer set.
Transponder, Mobile Satellite Services and Other	Capacity for voice, data and video services provided by third-party commercial satellite operators for which the desired frequency type or geographic coverage is not available on our network. These services include L-band MSS, for which Intelsat General is a reseller. In addition, this revenue category includes the sale of customer premises equipment and other hardware, as well as certain fees related to services provided to other satellite operators. These products are primarily marketed as follows: •Government: direct government users, and government contractors working on programs where aggregation of capacity is required.
Satellite-related Services	Services include a number of satellite-related consulting and technical services that involve the lifecycle of satellite operations and related infrastructure, from satellite and launch vehicle procurement through TT&C services and related equipment sales. These services are typically marketed to other satellite operators.

We market our services on a global basis, with almost every populated region of the world contributing to our revenue. The diversity of our revenue allows us to benefit from changing market conditions and lowers our risk from revenue fluctuations in our service applications and geographic regions.

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Trends Impacting Our Revenue

Our revenue at any given time is dependent upon a number of factors, including, but not limited to, demand for our services from existing and emerging applications; the supply of capacity available on our fleet and those of our competitors in a given region, and the substitution of competing technologies such as fiber optic cable networks. See Item 4B—Business Overview—Our Sector for a discussion of the global trends creating demand for our services. Trends in revenue can be impacted by:

- Growth in demand from wireless telecommunications companies seeking to complete or enhance broadband infrastructure, particularly those operating in developing regions or regions with geographic challenges;
- Growth in demand for broadband connectivity for enterprises and government organizations, providing fixed and mobile services and value-added applications on a global basis;
- Lower overall pricing for satellite-based services, resulting from oversupply of wide beam capacity or due to introduction of high throughput technology, which is designed to achieve a lower cost per unit;
- Lower demand for satellite-based solutions, resulting from fiber substitution;
- Satellite capacity needed to provide broadband connectivity for mobile networks on ships, planes and oil and gas platforms;
- Global demand for television content in standard, HD and UHD television formats, which uses our satellite network and IntelsatOne® terrestrial services for distribution, in some regions offset by next generation compression technologies;
- Increased popularity of OTT content distribution, which will increase the demand for broadband infrastructure in the developing world, but could decrease demand in developed markets over the mid to long-term as niche and ethnic programming transitions from satellite to internet distribution;
- Use of commercial satellite services by governments for military and other operations, which has partially slowed as a result of the tempo of military operations and recent changes in the U.S. budget; and
- Our use of third-party or off-network services to satisfy government demand for capacity not available on our network. These services are low risk in nature, with no required up-front investment and terms and conditions of the procured capacity which typically match the contractual commitments from our customers. Demand for certain of these off-network services has declined with reductions in troop deployment in regions of conflict.

See Item 4B—Business Overview—Our Customer Sets and Growing Applications for a discussion of our customers' uses of our services and see Item 4B—Business Overview—Our Strategy for a discussion of our strategies with respect to marketing to our various customer sets.

Customer Applications

Our transponder services, managed services, MSS and channel are used by our customers for three primary customer applications: network service applications, media applications and government applications.

Pricing

Pricing of our services is based upon a number of factors, including, but not limited to, the region served by the capacity, the power and other characteristics of the satellite beam, the amount of demand for the capacity available on a particular satellite and the total supply of capacity serving any particular region. In 2018, pricing trends were fairly stable throughout the year, albeit slightly lower than 2017, with declines in network services from lower pricing on high volume commitments leveraging our global wide beam and Intelsat Epic^{NG} fleets and government applications commanding competitive prices due to lowest price technically acceptable ("LPTA") policies. Media application pricing was stronger in 2018 as compared to 2017, but under pressure from competing lower-cost terrestrial alternatives. According to Euroconsult, the annual average price per transponder for C- and Ku- band capacity is forecasted to be on a slight downward trend globally from $1.28 million to $1.14 million per 36 MHz transponder over the period from 2018 to 2023, reflecting increasing supply from new satellite entrants, among other factors. HTS capacity, which is designed to attain a lower cost point, facilitating market expansion into new applications, is

expected to have similar rates of yield decline over time as increased supply enters the market.

The pricing of our services is generally fixed for the duration of the service commitment. New and renewing service commitments are priced to reflect regional demand and other factors as discussed above.

Operating Expenses

Direct Costs of Revenue (Excluding Depreciation and Amortization)

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Direct costs of revenue relate to costs associated with the operation and control of our satellites, our communications network and engineering support, and the purchase of off-network capacity. Direct costs of revenue consist principally of salaries and related employment costs, in-orbit insurance, earth station operating costs and facilities costs. Our direct costs of revenue fluctuate based on the number and type of services offered and under development, particularly as sales of off-network transponder services and sales of customer premises equipment fluctuate. We expect our direct costs of revenue to increase as we add customers and expand our managed services and use of off-network capacity.

Selling, General and Administrative Expenses

Selling, general and administrative expenses relate to costs associated with our sales and marketing staff and our administrative staff, which include legal, finance, corporate information technology and human resources. Staff expenses consist primarily of salaries and related employment costs, including stock compensation, travel costs and office occupancy costs. Selling, general and administrative expenses also include building maintenance and rent expenses and the provision for uncollectible accounts. Selling, general and administrative expenses generally fluctuate with the number of customers served and the number and types of services offered. These expenses also include research and development expenses, and fees for professional services.

Depreciation and Amortization

Our capital assets consist primarily of our satellites and associated ground network infrastructure. Included in capitalized satellite costs are the costs for satellite construction, satellite launch services, insurance premiums for satellite launch and the in-orbit testing period, the net present value of deferred satellite performance incentives payable to satellite manufacturers, and capitalized interest incurred during the satellite construction period. Capital assets are depreciated or amortized on a straight-line basis over their estimated useful lives. The remaining depreciable lives of our satellites range from less than one year to 16 years as of December 31, 2018.

Contracted Backlog

We benefit from strong visibility of our future revenues. Our contracted backlog is our expected future revenue under existing customer contracts and includes both cancellable and non-cancellable contracts. As of December 31, 2018, our contracted backlog was approximately $8.1 billion after the adoption of ASC 606 and $7.1 billion excluding the impact of the adoption of ASC 606. Referring to contracted backlog including the adoption of ASC 606, approximately 88% of this backlog related to contracts that were non-cancellable and approximately 11% related to contracts that were cancellable subject to substantial termination fees. As of December 31, 2018, the weighted average remaining customer contract life was approximately 4 years. We expect to deliver services associated with approximately $1.8 billion, or approximately 22%, of our December 31, 2018 contracted backlog during the year ending December 31, 2019. The amount included in backlog represents the full service charge for the duration of the contract and does not include termination fees. The amount of the termination fees, which is not included in the backlog amount, is generally calculated as a percentage of the remaining backlog associated with the contract. In certain cases of breach for non-payment or customer financial distress or bankruptcy, we may not be able to recover the full value of certain contracts or termination fees. Our contracted backlog includes 100% of the backlog of our consolidated ownership interests, which is consistent with the accounting for our ownership interest in these entities. Our contracted backlog as of December 31, 2018 was as follows (in millions):

Period	Amount Excluding ASC 606	Amount Including ASC 606
2019	$ 1,662.0	$ 1,764.7
2020	1,201.2	1,308.2
2021	856.7	964.3
2022	669.8	778.7
2023	548.6	657.5
2024 and thereafter	2,112.4	2,664.2

Total	$ 7,050.7	$ 8,137.6

Our contracted backlog by service type as of December 31, 2018 was as follows (in millions, except percentages):

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Service Type	Amount Excluding ASC 606	Percent	Amount Including ASC 606	Percent
Transponder services	$ 5,693.2	81 %	$ 6,740.1	83 %
Managed services	1,126.3	16 %	1,166.3	14 %
Off-Network and Other	228.7	3 %	228.7	3 %
Channel	2.5	— %	2.5	— %
Total	$ 7,050.7	100 %	$ 8,137.6	100 %

We believe this backlog and the resulting predictable cash flows in the FSS sector make our results less volatile than that of typical companies outside our industry.

A. Operating Results Years Ended December 31, 2017 and 2018

The following table sets forth our comparative statements of operations for the periods shown with the increase (decrease) and percentage changes, except those deemed not meaningful ("NM"), between the periods presented (in thousands, except percentages):

			Year Ended December 31, 2017 Compared to Year Ended December 31, 2018	
	Year Ended December 31, 2017	Year Ended December 31, 2018	Increase (Decrease)	Percentage Change
Revenue	$2,148,612	$2,161,190	$12,578	1 %
Operating expenses:				
Direct costs of revenue (excluding depreciation and amortization)	324,232	330,874	6,642	2 %
Selling, general and administrative	205,475	200,857	(4,618)	(2)%
Depreciation and amortization	707,824	687,589	(20,235)	(3)%
Total operating expenses	1,237,531	1,219,320	(18,211)	(1)%
Income from operations	911,081	941,870	30,789	3 %
Interest expense, net	1,020,770	1,212,374	191,604	19 %
Loss on early extinguishment of debt	(4,109)	(199,658)	(195,549)	NM
Other income, net	10,114	4,541	(5,573)	(55)%
Loss before income taxes	(103,684)	(465,621)	(361,937)	NM
Provision for income taxes	71,130	130,069	58,939	83 %
Net loss	(174,814)	(595,690)	(420,876)	NM
Net income attributable to noncontrolling interest	(3,914)	(3,915)	(1)	— %
Net loss attributable to Intelsat S.A.	$(178,728)	$(599,605)	$(420,877)	NM

Revenue

The following table sets forth our comparative revenue by service type, with Off-Network and Other Revenues shown separately from On-Network Revenues for the periods below (in thousands, except percentages):

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		Year Ended December 31, 2018						
	Year Ended December 31, 2017	Revenues Without the Adoption of ASC 606	ASC 606 Adjustments	Revenues After the Adoption of ASC 606	Increase (Decrease) With Adoption of ASC 606	Percentage Change With Adoption of ASC 606	Increase (Decrease) Without Adoption of ASC 606	Percentage Change Without Adoption of ASC 606
On-Network Revenues								
Transponder services	$1,543,384	$1,475,247	$95,031	$1,570,278	$26,894	2%	$(68,137)	(4)%
Managed services	412,147	386,597	6,667	393,264	(18,883)	(5)	(25,550)	(6)
Channel	5,405	4,250	—	4,250	(1,155)	(21)	(1,155)	(21)
Total on-network revenues	1,960,936	1,866,094	101,698	1,967,792	6,856	—	(94,842)	(5)
Off-Network and Other Revenues								
Transponder, MSS and other off-network services	141,845	148,807	1,379	150,186	8,341	6	6,962	5
Satellite-related services	45,831	43,082	130	43,212	(2,619)	(6)	(2,749)	(6)
Total off-network and other revenues	187,676	191,889	1,509	193,398	5,722	3	4,213	2
Total	$2,148,612	$2,057,983	$103,207	$2,161,190	$12,578	1%	$(90,629)	(4)%

Total revenue for the year ended December 31, 2018 increased by $12.6 million, or 1%, as compared to the year ended December 31, 2017. Excluding the impact of ASC 606 adjustments, total revenue for the year ended December 31, 2018 decreased by $90.6 million or 4% as compared to the year ended December 31, 2017. By service type, our revenues increased or decreased due to the following:

On-Network Revenues:

- Transponder services—an aggregate increase of $26.9 million, of which $95.0 million is attributable to ASC 606 adjustments. Excluding the impact of ASC 606 adjustments, the resulting decrease of $68.1 million was primarily due to a $35.0 million net decrease in revenue from network services customers and a $27.9 million decrease from media customers. The decrease in network services revenue was mainly due to declines for wide-beam wireless infrastructure and enterprise services due to non-renewals, renewals at lower pricing, and service contractions, partially offset by increases for maritime and aeronautical mobility applications. The decrease in media revenue was mainly due to non-renewals and pricing declines largely in the North America region.

- Managed services—an aggregate decrease of $18.9 million, inclusive of an increase of $6.7 million attributable to ASC 606 adjustments. Excluding the impact of ASC 606 adjustments, the resulting decrease of $25.6 million was largely due to a decrease of $12.7 million in revenue from media customers mainly due to advanced payments forfeited and fees related to a partial customer contract termination in 2017 with no comparable amounts in 2018, non-renewals related to managed video solutions, and a decline in managed media occasional use services. Revenue from network services customers decreased by $9.1 million, relating to point-to-point trunking applications that are switching to fiber alternatives, and revenue for managed network applications from our government customers decreased by $7.6 million largely in connection with a previously disclosed termination of a maritime contract. These declines were partially offset by a $6.0 million increase in revenue from network services customers largely related to mobility applications.

- Channel—an aggregate decrease of $1.2 million related to a continued decline due to the migration of international point-to-point satellite traffic to fiber optic cable, a trend we expect will continue.

Off-Network and Other Revenues:

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- Transponder, MSS and other off-network services—an aggregate increase of $8.3 million, of which $1.4 million is attributable to ASC 606 adjustments. Excluding the impact of ASC 606 adjustments, the resulting increase of $7.0 million was primarily due to growth in revenue from third-party applications in support of government customers and an increase in managed services revenue from network services and media customers.

- Satellite-related services—an aggregate decrease of $2.6 million, inclusive of an increase of $0.1 million attributable to ASC 606 adjustments. Excluding the impact of ASC 606 adjustments, the resulting decrease of $2.8 million reflects decreased revenues from professional services supporting third-party satellites and government customers.

Operating Expenses

Direct Costs of Revenue (Excluding Depreciation and Amortization)

Direct costs of revenue increased by $6.6 million, or 2%, to $330.9 million for the year ended December 31, 2018, as compared to the year ended December 31, 2017. The increase was primarily due to the following:

- an increase of $8.8 million largely due to higher cost of sales for customer premise equipment and higher third-party costs for off-network services; and

- an increase of $4.7 million in staff-related expenses; partially offset by

- a decrease of $2.9 million primarily driven by lower expenses related to ground network enhancements for our media business;

- a decrease of $2.0 million in satellite-related insurance costs; and

- a decrease of $1.4 million in licenses and fees.

Selling, General and Administrative

Selling, general and administrative expenses decreased by $4.6 million, or 2%, to $200.9 million for the year ended December 31, 2018, as compared to the year ended December 31, 2017. The decrease was primarily due to the following:

- a decrease of $8.9 million in staff-related expenses due to share-based compensation; and

- a decrease of $1.4 million in sales and marketing expenses; partially offset by

- an increase of $3.3 million in bad debt expense primarily due to settlement of a delinquent account in 2017; and

- an increase of $1.8 million in operating tax expenses mainly due to higher property taxes.

Depreciation and Amortization

Depreciation and amortization expense decreased by $20.2 million, or 3%, to $687.6 million for the year ended December 31, 2018, as compared to the year ended December 31, 2017. Significant items impacting depreciation and amortization included:

- a decrease of $72.1 million in depreciation expense due to the timing of certain satellites becoming fully depreciated, and other satellite related expenses; and

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a decrease of $3.8 million in amortization expense primarily due to changes in the pattern of consumption of amortizable intangible assets, as these assets primarily include acquired backlog, which relates to contracts covering varying periods that expire over time, and acquired customer relationships, for which the value diminishes over time; partially offset by

- an increase of $45.2 million in depreciation expense resulting from the impact of satellites placed in service; and
- an increase of $10.5 million in depreciation expense resulting from the impact of certain ground segment and building segment assets placed in service.

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Interest Expense, Net

Interest expense, net consists of gross interest expense we incur together with gains and losses on interest rate cap contracts (which reflect the change in their fair value), offset by interest income earned and the amount of interest we capitalize related to assets under construction. As of December 31, 2018, we held interest rate cap contracts with an aggregate notional amount of $2.4 billion to mitigate the risk of interest rate increases on the floating-rate term loans under our senior secured credit facilities. The caps have not been designated as hedges for accounting purposes.

Interest expense, net increased by $191.6 million, or 19%, to $1.2 billion for the year ended December 31, 2018, as compared to the year ended December 31, 2017. The increase in interest expense, net was principally due to:

- an increase of $116.3 million primarily related to the significant financing component identified in customer contracts in accordance with ASC 606;
- an increase of $68.4 million primarily driven by our new debt issuances and amendments with higher interest rates, partially offset by certain debt repurchases and exchanges in 2018; and
- an increase of $26 million from lower capitalized interest, primarily resulting from decreased levels of satellites and related assets under construction; partially offset by
- a decrease of $15.4 million corresponding to the increase in fair value of the interest rate cap contracts.

The non-cash portion of total interest expense, net was $150.4 million for the year ended December 31, 2018. The non-cash interest expense was primarily due to the significant financing component identified in customer contracts in accordance with ASC 606 and the amortization of deferred financing fees, amortization and accretion of discounts and premiums, and interest expense related to the significant financing component identified in customer contracts offset, in part, by the gain from the increase in fair value of the interest rate cap contracts we hold.

Loss on Early Extinguishment of Debt

Loss on early extinguishment of debt was $199.7 million for the year ended December 31, 2018, as compared to a loss of $4.1 million for the year ended December 31, 2017. The loss of $199.7 million consisted of the difference between the carrying value of the debt repurchased (see-Liquidity and Capital Resources-Long-Term Debt) and the total cash amount paid (including related fees and expenses), together with write-offs of unamortized debt issuance costs and unamortized debt discount or premium, if applicable.

Other Income, Net

Other income, net was $4.5 million for the year ended December 31, 2018, as compared to other income, net of $10.1 million for the year ended December 31, 2017. The decrease of $5.6 million was primarily driven by an $8.1 million foreign exchange fluctuation mainly related to our business conducted in Brazilian reais and Euros, partially offset by an increase of $2.0 million in other miscellaneous income not associated with our core operations.

Provision for Income Taxes

Our income tax expense increased by $59 million to $130.1 million for the year ended December 31, 2018, as compared to $71.1 million for the year ended December 31, 2017. The increase was principally due to additional tax expense for our U.S. subsidiaries as a result of the reorganization of ownership of certain assets among our subsidiaries that was implemented in the three months ended September 30, 2018 (the "2018 Internal Reorganization").

Cash paid for income taxes, net of refunds, totaled $57.1 million and $33.7 million for the years ended December 31, 2018 and 2017, respectively.

Net Loss Attributable to Intelsat S.A.

Net loss attributable to Intelsat S.A was $599.6 million for the year ended December 31, 2018, as compared to net loss attributable to Intelsat S.A. of $178.7 million for the year ended December 31, 2017. The change reflects the various items discussed above.

Operating Results Years Ended December 31, 2016 and 2017

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The following table sets forth our comparative statements of operations for the periods shown with the increase (decrease) and percentage changes, except those deemed not meaningful ("NM"), between the periods presented (in thousands, except percentages):

			Year Ended December 31, 2016 Compared to Year Ended December 31, 2017	
	Year Ended December 31, 2016	Year Ended December 31, 2017	Increase (Decrease)	Percentage Change
Revenue	$2,188,047	$2,148,612	$(39,435)	(2)%
Operating expenses:				
Direct costs of revenue (excluding depreciation and amortization)	342,634	324,232	(18,402)	(5)%
Selling, general and administrative	232,537	205,475	(27,062)	(12)%
Depreciation and amortization	694,891	707,824	12,933	2 %
Total operating expenses	1,270,062	1,237,531	(32,531)	(3)%
Income from operations	917,985	911,081	(6,904)	(1)%
Interest expense, net	938,501	1,020,770	82,269	9 %
Gain (loss) on early extinguishment of debt	1,030,092	(4,109)	(1,034,201)	NM
Other income, net	522	10,114	9,592	NM
Income (loss) before income taxes	1,010,098	(103,684)	(1,113,782)	NM
Provision for income taxes	15,986	71,130	55,144	NM
Net income (loss)	994,112	(174,814)	(1,168,926)	NM
Net income attributable to noncontrolling interest	(3,915)	(3,914)	1	— %
Net income (loss) attributable to Intelsat S.A.	$990,197	$(178,728)	$(1,168,925)	NM

Revenue

The following table sets forth our comparative revenue by service type, with Off-Network and Other Revenues shown separately from On-Network Revenues for the periods below (in thousands, except percentages):

	Year Ended December 31, 2016	Year Ended December 31, 2017	Increase (Decrease)	Percentage Change
On-Network Revenues				
Transponder services	$ 1,561,108	$ 1,543,384	$(17,724)	(1)%
Managed services	414,758	412,147	(2,611)	(1)
Channel	9,134	5,405	(3,729)	(41)
Total on-network revenues	1,985,000	1,960,936	(24,064)	(1)
Off-Network and Other Revenues				
Transponder, MSS and other off-network services	157,212	141,845	(15,367)	(10)
Satellite-related services	45,835	45,831	(4)	—
Total off-network and other revenues	203,047	187,676	(15,371)	(8)
Total	$ 2,188,047	$ 2,148,612	$(39,435)	(2)%

Total revenue for the year ended December 31, 2017 decreased by $39.4 million, or 2%, as compared to the year ended December 31, 2016. By service type, our revenues decreased due to the following:

On-Network Revenues:

- Transponder services-an aggregate decrease of $17.7 million, primarily due to a $54.6 million decrease in revenue from network services customers, partially offset by a $33.6 million increase in revenue from media customers and a $3.3 million increase in revenue from government customers. The network services decline was mainly due to non-renewals and renewal pricing at lower rates for wide-beam enterprise and wireless infrastructure services. The network services decline also reflects non-renewals of point-to-point connectivity, which is shifting to fiber alternatives. The

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increase in media revenue resulted primarily from the growth of DTH services in the Africa and Latin America and Caribbean regions, partially offset by declines in the North America, Europe and Middle East regions. The increase in government revenues is related to new revenues for mobility and other applications.

- Managed services-an aggregate decrease of $2.6 million, primarily due to a decrease of $13.9 million in revenue from network services customers largely for point-to-point trunking applications which are switching to fiber alternatives, a decrease of $12.4 million in revenue from our government customers for managed services largely related to government trunking and managed network applications related to a previously disclosed termination of a maritime contract, and a $4.1 million decrease in occasional use video services. These declines were partially offset by an increase of $22.5 million in revenue from network services customers for broadband solutions largely related to maritime and aeronautical mobility applications and a $6.6 million increase in managed video solutions in large part due to advanced payments forfeited and fees paid by a customer upon partial termination of services.
- Channel-an aggregate decrease of $3.7 million related to a continued decline due to the migration of international point-to-point satellite traffic to fiber optic cable, a trend we expect will continue.

Off-Network and Other Revenues:

- Transponder, MSS and other off-network services-an aggregate decrease of $15.4 million, primarily due to the previously disclosed termination of a maritime government contract, partially offset by increased revenue from services provided for a media customer on a third-party satellite.
- Satellite-related services-remained effectively unchanged from the prior year.

Operating Expenses

Direct Costs of Revenue (Excluding Depreciation and Amortization)

Direct costs of revenue decreased by $18.4 million, or 5%, to $324.2 million for the year ended December 31, 2017, as compared to the year ended December 31, 2016. The decrease was primarily due to the following:

- a decrease of $22.2 million largely due to lower cost of sales for customer premises equipment and lower third-party costs for off-network services associated with our government business; and
- a decrease of $7.6 million in staff-related expenses; partially offset by
- an increase of $7.0 million due to increases in direct costs associated with capacity provided through an Intelsat payload on a third-party satellite.

Selling, General and Administrative

Selling, general and administrative expenses decreased by $27.1 million, or 12%, to $205.5 million for the year ended December 31, 2017, as compared to the year ended December 31, 2016. The decrease was primarily due to the following:

- a decrease of $28.7 million in bad debt expense primarily related to two customers in the Latin America and Caribbean region; and
- a decrease of $14.2 million in staff-related expenses; partially offset by
- an increase of $19.0 million in professional fees primarily due to our liability management initiatives and costs associated with a proposed merger that was later terminated.

Depreciation and Amortization

Depreciation and amortization expense increased by $12.9 million, or 2%, to $707.8 million for the year ended December 31, 2017, as compared to the year ended December 31, 2016. Significant items impacting depreciation and amortization included:

- an increase of $83.3 million in depreciation expense resulting from the impact of satellites placed in service; and
- an increase of $8.2 million in depreciation expense resulting from the impact of certain ground segment assets placed in service; partially offset by
- a decrease of $72.6 million in depreciation expense due to the timing of certain satellites becoming fully depreciated, and other satellite related expenses; and

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- a decrease of $6.2 million in amortization expense primarily due to changes in the pattern of consumption of amortizable intangible assets, as these assets primarily include acquired backlog, which relates to contracts covering varying periods that expire over time, and acquired customer relationships, for which the value diminishes over time.

Interest Expense, Net

Interest expense, net consists of gross interest expense we incur together with gains and losses on interest rate hedging transactions (which reflect the change in their fair value), offset by interest income earned and the amount of interest we capitalize related to assets under construction. As of December 31, 2017, we held interest rate caps with an aggregate notional amount of $2.4 billion to mitigate the risk of interest rate increase on the floating-rate term loans under our senior secured credit facilities. The caps have not been designated as hedges for accounting purposes.

Interest expense, net increased by $82.3 million, or 9%, to $1.0 billion for the year ended December 31, 2017, as compared to the year ended December 31, 2016. The increase in interest expense, net was principally due to:

- a net increase of $44.3 million in interest expense primarily driven by our new debt issuances with higher interest rates, partially offset by certain debt repurchases and exchanges in 2016 and 2017; and
- a net increase of $35.3 million from lower capitalized interest, primarily resulting from decreased levels of satellites and related assets under construction.

The non-cash portion of total interest expense, net was $48.7 million for the year ended December 31, 2017. The non-cash interest expense was due to the amortization of deferred financing fees and the amortization and accretion of discounts and premiums.

Gain (Loss) on Early Extinguishment of Debt

Loss on early extinguishment of debt was $4.1 million for the year ended December 31, 2017, as compared to a gain of $1.0 billion for the year ended December 31, 2016. The loss and gain were related to certain debt transactions that occurred during each of the respective years (see-Liquidity and Capital Resources-Long-Term Debt). The respective loss and gain consisted of the difference between the carrying value of the debt redeemed or exchanged and the fair value of the debt issued, if applicable, and total cash amount paid (including related fees and expenses), together with write-offs of unamortized debt issuance costs.

Other Income, Net

Other income, net was $10.1 million for the year ended December 31, 2017, as compared to other income, net of $0.5 million for the year ended December 31, 2016. The variance of $9.6 million was primarily driven by a $5.3 million foreign exchange fluctuation related to our business conducted in Brazilian reais and Euros, and a $3.1 million increase in other miscellaneous income related to activities that are not associated with our core operations.

Provision for Income Taxes

Our income tax expense increased by $55.1 million to $71.1 million for the year ended December 31, 2017, as compared to $16.0 million for the year ended December 31, 2016. The increase in expense was principally due to valuation allowances recorded on certain deferred tax assets partially offset by tax benefits related to the tax rate change for our U.S. subsidiaries as a result of the U.S. Tax Cuts and Jobs Act which was enacted on December 22, 2017

Cash paid for income taxes, net of refunds, totaled $33.7 million and $22.7 million for the years ended December 31, 2017 and 2016, respectively.

Net Income (Loss) Attributable to Intelsat S.A.

Net loss attributable to Intelsat S.A was $178.7 million for the year ended December 31, 2017, as compared to net income attributable to Intelsat S.A. of $990.2 million for the year ended December 31, 2016. The change reflects the various items discussed above.

EBITDA

EBITDA consists of earnings before net interest, loss (gain) on early extinguishment of debt, taxes and depreciation and amortization. Given our high level of leverage, refinancing activities are a frequent part of our efforts to manage our costs of borrowing. Accordingly, we consider loss (gain) on early extinguishment of debt an element of interest expense. EBITDA is a measure

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commonly used in the FSS sector, and we present EBITDA to enhance the understanding of our operating performance. We use EBITDA as one criterion for evaluating our performance relative to that of our peers. We believe that EBITDA is an operating performance measure, and not a liquidity measure, that provides investors and analysts with a measure of operating results unaffected by differences in capital structures, capital investment cycles and ages of related assets among otherwise comparable companies. However, EBITDA is not a measure of financial performance under U.S. GAAP, and our EBITDA may not be comparable to similarly titled measures of other companies. EBITDA should not be considered as an alternative to operating income (loss) or net income (loss) determined in accordance with U.S. GAAP, as an indicator of our operating performance, or as an alternative to cash flows from operating activities determined in accordance with U.S. GAAP, as an indicator of cash flows, or as a measure of liquidity.

A reconciliation of net income (loss) to EBITDA for the periods shown is as follows (in thousands):

	Year Ended December 31, 2016	Year Ended December 31, 2017	Year Ended December 31, 2018
Net income (loss)	$ 994,112	$ (174,814)	$ (595,690)
Add (Subtract):			
Interest expense, net [1]	938,501	1,020,770	1,212,374
Loss (gain) on early extinguishment of debt	(1,030,092)	4,109	199,658
Provision for income taxes [2]	15,986	71,130	130,069
Depreciation and amortization	694,891	707,824	687,589
EBITDA	1,613,398	1,629,019	1,634,000
Effect of ASC 606 adoption [3]	—	—	(103,447)
EBITDA excluding ASC 606 adoption effect	$ 1,613,398	$ 1,629,019	$ 1,530,553

(1) Interest expense, net for the twelve months ended December 31, 2018 includes $116,190 related to the significant financing component identified in customer contracts in accordance with ASC 606.

(2) Includes a provision of $43,349 for the twelve months ended December 31, 2018 related to the adoption of ASC 606 and implementation of the 2018 Internal Reorganization.

(3) Includes $103,207 of revenue relating to the significant financing, multi-product, and contract modification components identified in customer contracts for the twelve months ended December 31, 2018, operating expense adjustments of $1,028 for the twelve months ended December 31, 2018, and adjustments of $788 to other income, net for the twelve months ended December 31, 2018, in accordance with the adoption of ASC 606.

Adjusted EBITDA

In addition to EBITDA, we calculate a measure called Adjusted EBITDA to assess the operating performance of Intelsat S.A. Adjusted EBITDA consists of EBITDA of Intelsat S.A. as adjusted to exclude or include certain unusual items, certain other operating expense items and certain other adjustments as described in the table and related footnotes below. Our management believes that the presentation of Adjusted EBITDA provides useful information to investors, lenders and financial analysts regarding our financial condition and results of operations because it permits clearer comparability of our operating performance between periods. By excluding the potential volatility related to the timing and extent of non-operating activities, such as impairments of asset value and other non-recurring items, our management believes that Adjusted EBITDA provides a useful means of evaluating the success of our operating activities. We also use Adjusted EBITDA, together with other appropriate metrics, to set goals for and measure the operating performance of our business, and it is one of the principal measures we use to evaluate our management's performance in determining compensation under our incentive compensation plans. Adjusted EBITDA measures have been used historically by investors, lenders and financial analysts to estimate the value of a company, to make informed investment decisions and to evaluate performance. Our management believes that the inclusion of Adjusted

EBITDA facilitates comparison of our results with those of companies having different capital structures. Adjusted EBITDA is not a measure of financial performance under U.S. GAAP and may not be comparable to similarly titled measures of other companies. Adjusted EBITDA should not be considered as an alternative to operating income (loss) or net income (loss) determined in accordance with U.S. GAAP, as an indicator of our operating performance, as an alternative to cash flows from operating activities determined in accordance with U.S. GAAP, as an indicator of cash flows, or as a measure of liquidity.

A reconciliation of net income (loss) to EBITDA and EBITDA to Adjusted EBITDA is as follows (in thousands):

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	Year Ended December 31, 2016	Year Ended December 31, 2017	Year Ended December 31, 2018
Net income (loss)	$ 994,112	$ (174,814)	$ (595,690)
Add (Subtract):			
Interest expense, net [1]	938,501	1,020,770	1,212,374
Loss (gain) on early extinguishment of debt	(1,030,092)	4,109	199,658
Provision for income taxes [2]	15,986	71,130	130,069
Depreciation and amortization	694,891	707,824	687,589
EBITDA	1,613,398	1,629,019	1,634,000
Add:			
Compensation and benefits [3]	23,222	15,995	6,824
Non-recurring and other non-cash items [4]	14,050	19,589	27,646
Adjusted EBITDA	1,650,670	1,664,603	1,668,470
Effect of ASC 606 adoption [5]	—	—	(103,447)
Adjusted EBITDA excluding ASC 606 adoption effect	$ 1,650,670	$ 1,664,603	$ 1,565,023

(1) Interest expense, net for the twelve months ended December 31, 2018 includes $116,190 related to the significant financing component identified in customer contracts in accordance with ASC 606.

(2) Includes a provision of $43,349 for the twelve months ended December 31, 2018 related to the adoption of ASC 606 and implementation of the 2018 Internal Reorganization.

(3) Reflects non-cash expenses incurred relating to our equity compensation plans.

(4) Reflects certain non-recurring gains and losses and non-cash items, including the following: professional fees related to our liability and tax management initiatives; costs associated with our C-band spectrum solution proposal; severance, retention and relocation payments; and other various non-recurring expenses. These costs were partially offset by non-cash income related to the recognition of deferred revenue on a straight-line basis for certain prepaid capacity service contracts.

(5) Includes $103,207 of revenue relating to the significant financing, multi-product, and contract modification components identified in customer contracts for the twelve months ended December 31, 2018, operating expense adjustments of $1,028 for the twelve months ended December 31, 2018, and adjustments of $788 to other income, net for the twelve months ended December 31, 2018, in accordance with the adoption of ASC 606.

B. Liquidity and Capital Resources

Overview

We are a highly leveraged company and our contractual obligations, commitments and debt service requirements over the next several years are significant. At December 31, 2018, the aggregate principal amount of our debt outstanding not held by affiliates was $14.0 billion. Our interest expense, net for the year ended December 31, 2018 was $1.2 billion, which included $48.5 million of non-cash interest expense. We also expect to make significant capital expenditures in 2019 and future years, as set forth below in—Capital Expenditures. Our primary source of liquidity is and will continue to be cash generated from operations, as well as existing cash. At December 31, 2018, cash and cash equivalents were approximately $485.1 million. In addition, $22.0 million of restricted cash was included within current assets on the consolidated balance sheet as compensating balances against certain letters of credit outstanding. We currently expect to use cash on hand, cash flows from operations and refinancing of our third party debt to fund

our most significant cash outlays, including debt service requirements and capital expenditures, in the next twelve months and beyond, and expect such sources to be sufficient to fund our requirements over that time and beyond. In past years, our cash flows from operations and cash on hand have been sufficient to fund interest obligations ($915.6 million and $1.1 billion in 2017 and 2018, respectively) and significant capital expenditures ($461.6 million and $255.7 million in 2017 and 2018, respectively). Our total capital expenditures are expected to range from $250 million to $300 million in 2019, $275 million to $350 million in 2020, and $250 million to $350 million in 2021. However, an inability to generate sufficient cash flow to satisfy our debt service obligations or to refinance our obligations on commercially reasonable terms would have an adverse effect on our business, financial position, results of operations and cash flows, as well as on our and our subsidiaries' ability to satisfy their obligations in respect of their respective debt. See Item 3D—Risk Factors—Risk Factors Relating to Our Business—We have a substantial amount of indebtedness, which may adversely affect our cash flow and our ability to operate our business, remain in compliance with debt covenants, and make payments on our indebtedness. We also continually evaluate ways to simplify our capital structure and opportunistically extend our

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maturities and reduce our costs of debt. In addition, we may from time to time retain any future earnings and cash to repurchase, repay, redeem or retire any of our outstanding debt securities in privately negotiated or open market transactions, by tender offer or otherwise.

Cash Flow Items

Our cash flows consisted of the following for the periods shown (in thousands):

	Year Ended December 31, 2016	Year Ended December 31, 2017	Year Ended December 31, 2018
Net cash provided by operating activities	$ 678,755	$ 464,246	$ 344,173
Net cash used in investing activities	(730,589)	(468,297)	(283,634)
Net cash provided by (used) in financing activities	546,347	(121,698)	(90,323)
Net change in cash, cash equivalents and restricted cash	494,483	(124,633)	(34,234)

Net Cash Provided by Operating Activities

Net cash provided by operating activities decreased by $120.1 million to $344.2 million for the year ended December 31, 2018 as compared to the year ended December 31, 2017. The decrease was due to a $221.8 million decrease in net income and changes in non-cash items offset by a $101.7 million increase from changes in operating assets and liabilities. The primary drivers of the increase in operating assets and liabilities were higher inflows from deferred revenue and contract liabilities and lower outflows related to the payment of accounts payable, partially offset by higher outflows related to the amount and timing of interest payments and lower inflows from customer receivables.

Net Cash Used in Investing Activities

Net cash used in investing activities decreased by $184.7 million to $283.6 million during the year ended December 31, 2018 as compared to the year ended December 31, 2017. The decrease was primarily due to lower capital expenditures, partially offset by lower insurance proceeds received related to Intelsat 33e and increased capital contributions to a joint venture.

Net Cash Used in Financing Activities

Net cash used in financing activities decreased by $31.4 million to $90.3 million during the year ended December 31, 2018 as compared to the year ended December 31, 2017. The decrease was primarily due to $224.3 million net proceeds from our common shares offering (see - Long-Term Debt below), $35.4 million in other payments for satellites in 2017 with no comparable amounts in 2018, and a decrease of $11.7 million in principal payments on deferred satellite performance incentives, partially offset by an increase of $242.6 million in net cash paid in connection with our refinancing activities in 2018 (see - Long-Term Debt below).

Restricted Cash

As of December 31, 2018, $22.0 million of cash was legally restricted, being held as a compensating balance for certain outstanding letters of credit.

Long-Term Debt

This section describes the changes to our long-term debt during the years ended December 31, 2017 and 2018. For detail regarding our outstanding long-term indebtedness as of December 31, 2018, see Note 12 to our consolidated financial statements included elsewhere in this Annual Report.

Senior Secured Credit Facilities

Intelsat Jackson Senior Secured Credit Agreement

On January 12, 2011, Intelsat Jackson entered into a secured credit agreement (the “Intelsat Jackson Secured Credit Agreement”), which included a $3.25 billion term loan facility and a $500.0 million revolving credit facility, and borrowed the full $3.25 billion under the term loan facility. The term loan facility required regularly scheduled quarterly payments of

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principal equal to 0.25% of the original principal amount of the term loan beginning six months after January 12, 2011, with the remaining unpaid amount due and payable at maturity.

On October 3, 2012, Intelsat Jackson entered into an Amendment and Joinder Agreement (the "Jackson Credit Agreement Amendment"), which amended the Intelsat Jackson Secured Credit Agreement. As a result of the Jackson Credit Agreement Amendment, interest rates for borrowings under the term loan facility and the revolving credit facility were reduced. In April 2013, our corporate family rating was upgraded by Moody's, and as a result, the interest rate for the borrowing under the term loan facility and revolving credit facility were further reduced to LIBOR plus 3.00% or the Above Bank Rate ("ABR") plus 2.00%.

On November 27, 2013, Intelsat Jackson entered into a Second Amendment and Joinder Agreement (the "Second Jackson Credit Agreement Amendment"), which further amended the Intelsat Jackson Secured Credit Agreement. The Second Jackson Credit Agreement Amendment reduced interest rates for borrowings under the term loan facility and extended the maturity of the term loan facility. In addition, it reduced the interest rate applicable to $450 million of the $500 million total revolving credit facility and extended the maturity of such portion. As a result of the Second Jackson Credit Agreement Amendment, interest rates for borrowings under the term loan facility and the new tranche of the revolving credit facility were (i) LIBOR plus 2.75%, or (ii) the ABR plus 1.75%. The LIBOR and the ABR, plus applicable margins, related to the term loan facility and the new tranche of the revolving credit facility were determined as specified in the Intelsat Jackson Secured Credit Agreement, as amended by the Second Jackson Credit Agreement Amendment, and the LIBOR was not to be less than 1.00% per annum. The maturity date of the term loan facility was extended from April 2, 2018 to June 30, 2019 and the maturity of the new $450 million tranche of the revolving credit facility was extended from January 12, 2016 to July 12, 2017. The interest rates and maturity date applicable to the $50 million tranche of the revolving credit facility that was not amended did not change. The Second Jackson Credit Agreement Amendment further removed the requirement for regularly scheduled quarterly principal payments under the term loan facility.

In June 2017, Intelsat Jackson terminated all remaining commitments under its revolving credit facility.

On November 27, 2017, Intelsat Jackson entered into a Third Amendment and Joinder Agreement (the "Third Jackson Credit Agreement Amendment"), which further amended the Intelsat Jackson Secured Credit Agreement. The Third Jackson Credit Agreement Amendment extended the maturity date of $2.0 billion of the existing floating rate B-2 Tranche of term loans (the "B-3 Tranche Term Loans"), to November 27, 2023, subject to springing maturity in the event that certain series of Intelsat Jackson's senior notes are not refinanced prior to the dates specified in the Third Jackson Credit Agreement Amendment. The B-3 Tranche Term Loans have an applicable interest rate margin of 3.75% for LIBOR loans and 2.75% for base rate loans (at Intelsat Jackson's election as applicable).

The B-3 Tranche Term Loans were subject to a prepayment premium of 1.00% of the principal amount for any voluntary prepayment of, or amendment or modification in respect of, the B-3 Tranche Term Loans prior to November 27, 2018 in connection with prepayments, amendments or modifications that have the effect of reducing the applicable interest rate margin on the B-3 Tranche Term Loans, subject to certain exceptions. The Third Jackson Credit Agreement Amendment also (i) added a provision requiring that, beginning with the fiscal year ending December 31, 2018, Intelsat Jackson to apply a certain percentage of its Excess Cash Flow (as defined in the Third Jackson Credit Agreement Amendment), if any, after operational needs for each fiscal year towards the repayment of outstanding term loans, subject to certain deductions, (ii) amended the most-favored nation provision with respect to the incurrence of certain indebtedness by Intelsat Jackson and its restricted subsidiaries, and (iii) amended the covenant limiting the ability of Intelsat Jackson to make certain dividends, distributions and other restricted payments to its shareholders based on its leverage level at that time.

On December 12, 2017, Intelsat Jackson further amended the Intelsat Jackson Secured Credit Agreement by entering into a Fourth Amendment and Joinder Agreement (the "Fourth Jackson Credit Agreement Amendment"), which, among other things, (i) permitted Intelsat Jackson to establish one or more series of additional incremental term loan tranches if the proceeds thereof are used to refinance an existing tranche of term loans, and (ii) added a most-favored nation

provision applicable to the B-3 Tranche Term Loans for further extensions of the existing floating rate B-2 Tranche Term Loans under certain circumstances.

On January 2, 2018, Intelsat Jackson entered into a Fifth Amendment and Joinder Agreement (the "Fifth Jackson Credit Agreement Amendment"), which further amended the Intelsat Jackson Secured Credit Agreement. The Fifth Jackson Credit Agreement Amendment refinanced the remaining $1.095 billion B-2 Tranche Term Loans, through the creation of (i) a new incremental floating rate tranche of term loans with a principal amount of $395.0 million (the "B-4 Tranche Term Loans"), and (ii) a new incremental fixed rate tranche of term loans with a principal amount of $700.0 million (the "B-5 Tranche Term Loans"). The maturity date of both the B-4 Tranche Term Loans and the B-5 Tranche Term Loans is January 2, 2024, subject to

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springing maturity in the event that certain series of Intelsat Jackson's senior notes are not refinanced or repaid prior to the dates specified in the Fifth Jackson Credit Agreement Amendment. The B-4 Tranche Term Loans have an applicable interest rate margin of 4.50% per annum for LIBOR loans and 3.50% per annum for base rate loans (at Intelsat Jackson's election as applicable). We entered into interest rate cap contracts in December 2017 and amended them in May 2018 to mitigate the risk of interest rate increases on the B-4 Tranche Term Loans. The B-5 Tranche Term Loans have an interest rate of 6.625% per annum. The Fifth Jackson Credit Agreement Amendment also specified make-whole and prepayment premiums applicable to the B-4 Tranche Term Loans and the B-5 Tranche Term Loans at various dates.

Intelsat Jackson's obligations under the Intelsat Jackson Secured Credit Agreement are guaranteed by ICF and certain of Intelsat Jackson's subsidiaries. Intelsat Jackson's obligations under the Intelsat Jackson Secured Credit Agreement are secured by a first priority security interest in substantially all of the assets of Intelsat Jackson and the guarantors party thereto, to the extent legally permissible and subject to certain agreed exceptions, and by a pledge of the equity interests of the subsidiary guarantors and the direct subsidiaries of each guarantor, subject to certain exceptions, including exceptions for equity interests in certain non-U.S. subsidiaries, existing contractual prohibitions and prohibitions under other legal requirements.

The Intelsat Jackson Secured Credit Agreement following a further amendment in November 2018 includes one financial covenant: Intelsat Jackson must maintain a consolidated secured debt to consolidated EBITDA ratio equal to or less than 3.50 to 1.00 at the end of each fiscal quarter as such financial measure is defined in the Intelsat Jackson Secured Credit Agreement. Intelsat Jackson was in compliance with this financial maintenance covenant ratio with a consolidated secured debt to consolidated EBITDA ratio of 2.94 to 1.00 as of December 31, 2018.

2018 Debt and Other Capital Markets Transactions

March/May 2018 ICF Tender Offer for Intelsat Luxembourg Notes and Redemption

In March 2018, ICF commenced a cash tender offer to purchase any and all of the outstanding aggregate principal amount of the 6.75% Senior Notes due 2018 (the "2018 Luxembourg Notes"). ICF purchased a total of $31.2 million aggregate principal amount of the 2018 Luxembourg Notes at par value in March 2018 and April 2018. In May 2018, pursuant to a previously issued notice of redemption, Intelsat Luxembourg redeemed $46.0 million aggregate principal amount of the 2018 Luxembourg Notes at par value together with accrued and unpaid interest thereon.

June 2018 Intelsat S.A. Senior Convertible Notes Offering and Common Shares Offering

In June 2018, we completed an offering of 15,498,652 Intelsat S.A. common shares, nominal value $0.01 per share (the "Common Shares"), at a public offering price of $14.84 per common share, and we completed an offering of $402.5 million aggregate principal amount of our 4.5% Convertible Senior Notes due 2025 (the "2025 Convertible Notes"). These notes are guaranteed by Intelsat Envision. The net proceeds from the Common Shares offering and 2025 Convertible Notes offering were used to repurchase approximately $600 million aggregate principal amount of Intelsat Luxembourg's 7.75% Senior Notes due 2021 (the "2021 Luxembourg Notes") in privately negotiated transactions with individual holders in June 2018. We used the remaining net proceeds of the Common Shares offering and 2025 Convertible Notes offering for further repurchases of 2021 Luxembourg Notes and for other general corporate purposes, including repurchases of other tranches of debt of Intelsat S.A.'s subsidiaries.

August 2018 Intelsat Connect Senior Notes Refinancing and Exchange of Intelsat Luxembourg Senior Notes

In August 2018, Intelsat Connect completed an offering of $1.25 billion aggregate principal amount of 9.5% Senior Notes due 2023 (the "2023 ICF Notes"). These notes are guaranteed by Intelsat Envision and Intelsat Luxembourg. Intelsat Connect used the net proceeds from the offering to repurchase or redeem all $731.9 million outstanding aggregate principal amount of Intelsat Connect 12.5% Senior Notes due 2022 (the "2022 ICF Notes"). The remaining net proceeds from the offering were used to repurchase approximately $448.9 million aggregate principal amount of Intelsat Jackson's 7.25% Senior Notes due 2020 (the "2020 Jackson Notes") and $30.0 million aggregate principal amount of other unsecured notes of Intelsat Jackson, and to pay related fees and expenses. Also in August 2018, Intelsat Connect and Intelsat Envision completed debt exchanges receiving new notes issued by Intelsat Luxembourg,

which mature in August 2026 and have an interest rate of 13.5%, in exchange for $1.58 billion aggregate principal amount of 2021 Luxembourg Notes that were previously held by Intelsat Connect and Intelsat Envision.

September 2018 Intelsat Jackson Senior Notes Offering and Tender Offer

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In September 2018, Intelsat Jackson completed an offering of $2.25 billion aggregate principal amount of 8.5% Senior Notes due 2024 (the "2024 Jackson Senior Unsecured Notes"). The notes are guaranteed by all of Intelsat Jackson's subsidiaries that guarantee its obligations under the Intelsat Jackson Secured Credit Agreement, as well as by certain of Intelsat Jackson's parent entities. Intelsat Jackson used the net proceeds from the offering to repurchase through a tender offer and redeem approximately $1.75 billion aggregate principal amount of the remaining outstanding 2020 Jackson Notes. The remaining net proceeds from the 2024 Jackson Senior Unsecured Notes offering were used to repurchase and redeem approximately $441.3 million aggregate principal amount of Intelsat Jackson's 7.5% Senior Notes due 2021 (the "2021 Jackson Notes") in September 2018 and October 2018, and to pay related fees and expenses.

October 2018 Intelsat Jackson Senior Notes Add-On Offering and Redemption of 2021 Jackson Notes

In October 2018, Intelsat Jackson completed an add-on offering of $700 million aggregate principal amount of its 2024 Jackson Senior Unsecured Notes. The net proceeds from the add-on offering, together with cash on hand, were used to repurchase and redeem all the remaining approximately $708.7 million aggregate principal amount of outstanding 2021 Jackson Notes in October 2018 that were not earlier repurchased or redeemed, and to pay related fees and expenses.

2017 Debt Transactions

January 2017 Intelsat Luxembourg Exchange Offer

In January 2017, Intelsat Luxembourg completed a debt exchange (the "Second 2018 Luxembourg Exchange"), whereby it exchanged $403.3 million aggregate principal amount of its 2018 Luxembourg Notes for an equal aggregate principal amount of newly issued unsecured 12.50% Senior Notes due 2024 (the "2024 Luxembourg Notes"). The Second 2018 Luxembourg Exchange consisted of $377.6 million aggregate principal amount of 2018 Luxembourg Notes held by ICF as a result of the First 2018 Luxembourg Exchange (as defined and described below), together with $25 million aggregate principal amount of 2018 Luxembourg Notes repurchased by us in the fourth quarter of 2015. We consolidate ICF, the holder of the 2018 Luxembourg Notes exchanged in the Second 2018 Luxembourg Exchange.

July 2017 Intelsat Jackson Senior Notes Refinancing

On July 5, 2017, Intelsat Jackson completed an offering of $1.5 billion aggregate principal amount of 9.75% Senior Notes due 2025 (the "2025 Jackson Notes"). These notes are guaranteed by all of Intelsat Jackson's subsidiaries that guarantee its obligations under the Intelsat Jackson Secured Credit Agreement and senior notes, as well as by certain of Intelsat Jackson's parent entities. Also on July 5, 2017, the net proceeds from the sale of the 2025 Jackson Notes were used, along with other available cash, to satisfy and discharge all $1.5 billion aggregate principal amount of Intelsat Jackson's 7.25% Senior Notes due 2019. In connection with the satisfaction and discharge, we recognized a loss on early extinguishment of debt of $4.6 million, consisting of the difference between the carrying value of the debt redeemed and the total cash amount paid (including related fees and expenses), together with a write-off of unamortized debt issuance costs.

November & December 2017 and January 2018 Amendments to Intelsat Jackson Senior Secured Credit Facilities

In November and December 2017, and January 2018, Intelsat Jackson entered into amendments to the Intelsat Jackson Secured Credit Agreement. See—Description of Indebtedness—Intelsat Jackson—Intelsat Jackson Senior Secured Credit Agreement, above.

Satellite Performance Incentives

Our cost of satellite construction includes an element of deferred consideration to satellite manufacturers referred to as satellite performance incentives. We are contractually obligated to make these payments over the lives of the satellites, provided the satellites continue to operate in accordance with contractual specifications. We capitalize the present value of these payments as part of the cost of the satellites and record a corresponding liability to the satellite manufacturers. This asset is amortized over the useful lives of the satellites, interest expense is recognized on the

deferred financing and the liability is reduced as the payments are made. Our total satellite performance incentive payment liability as of December 31, 2017 and 2018 was $241.1 million and $245.6 million, respectively.

Capital Expenditures

Our capital expenditures depend on our business strategies and reflect our commercial responses to opportunities and trends in our industry. Our actual capital expenditures may differ from our expected capital expenditures if, among other things, we enter into any currently unplanned strategic transactions. Levels of capital spending from one year to the next are also

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influenced by the nature of the satellite life cycle and by the capital-intensive nature of the satellite industry. For example, we incur significant capital expenditures during the years in which satellites are under construction. We typically procure a new satellite within a timeframe that would allow the satellite to be deployed at least one year prior to the end of the service life of the satellite to be replaced. As a result, we frequently experience significant variances in our capital expenditures from year to year. The following table compares our satellite-related capital expenditures to total capital expenditures from 2014 through 2018 (in thousands).

Year	Satellite-Related Capital Expenditures	Total Capital Expenditures
2014	$ 566,716	$ 645,424
2015	657,656	724,362
2016	629,346	714,570
2017	355,675	461,627
2018	165,143	255,696
Total	$ 2,374,536	$ 2,801,679

Capital expenditure guidance for 2019 through 2021 (the “Guidance Period”) assumes investment in five satellites, two of which are in the design and manufacturing phase. Of the remaining three satellites, no manufacturing contracts have yet been signed.

Payments for satellites and other property and equipment for the year ended December 31, 2018 were $255.7 million. We intend to fund our capital expenditure requirements through cash on hand and cash provided from operating activities.

Currency and Exchange Rates

Substantially all of our customer contracts, capital expenditure contracts and operating expense obligations are denominated in U.S. dollars. Consequently, we are not exposed to material foreign currency exchange risk. However, the service contracts with our Brazilian customers provide for payment in Brazilian reais. Accordingly, we are subject to the risk of a reduction in the value of the Brazilian real as compared to the U.S. dollar in connection with payments made by Brazilian customers, and our exposure to fluctuations in the exchange rate for Brazilian reais is ongoing. However, the rates payable under our service contracts with Brazilian customers are adjusted annually to account for inflation in Brazil, thereby mitigating the risk. For the years ended December 31, 2016, 2017 and 2018, our Brazilian customers represented approximately 3.7%, 4.0% and 3.3% of our revenue, respectively. Transactions in other currencies are converted into U.S. dollars using exchange rates in effect on the dates of the transactions.

We recorded foreign currency exchange gains of $3.3 million and $0.9 million and losses of $6.7 million for the years ended December 31, 2016, 2017 and 2018, respectively. The gains and losses for each year were primarily attributable to the conversion of our Brazilian reais receivables and cash balances held in Brazil, and were net of other working capital account balances translated into U.S. dollars at the exchange rates in effect on the last day of the applicable year or, with respect to exchange transactions effected during the year, at the time the exchange transactions occurred.

C. Research and Development, Patents and Licenses

During the year ended December 31, 2018, we incurred expenses of $1.2 million for development activities. Further, Intelsat personnel regularly engage in activities that are intended to result in new or improved functions, performance, or quality related to our network, teleports and satellites.

D. Trend Information

Other than as disclosed elsewhere in this Annual Report, we are not aware of any trends, uncertainties, demands, commitments or events that are reasonably likely to have a material adverse effect on our revenues, income, profitability, liquidity or capital resources, or that would cause the disclosed financial information to be not necessarily indicative of future operating results or financial conditions. See Item 5—Operating and Financial Review

and Prospects for further discussion.

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E. Off-Balance Sheet Arrangements

We have a revenue sharing agreement with JSAT International, Inc. ("JSAT") related to services sold on the Horizons Holdings satellites. We are responsible for billing and collection for such services and we remit 50% of the revenue, less applicable fees and commissions, to JSAT. Refer to Note 10—Investments for disclosures relating to the revenue sharing agreement with JSAT.

F. Tabular Disclosure of Contractual Obligations

The following table sets forth our contractual obligations and capital and certain other commitments as of December 31, 2018, and the expected year of payments (in thousands):

	Payments due by year							
Contractual Obligations (1)	2019	2020	2021	2022	2023	2024 and thereafter	Other	Total
Long-Term debt obligations								
Intelsat S.A. and subsidiary notes and credit facilities—principal payments	$—	$ —	$421,219	$490,000	$6,123,337	$7,282,283	$ —	$14,316,839
Intelsat S.A. and subsidiary notes and credit facilities—interest payments (2)	1,106,087	1,087,911	1,090,157	1,077,549	884,871	641,556	—	5,888,065
Operating lease obligations	20,016	16,730	14,832	13,979	13,600	80,216		161,422
Sublease rental income	(826)	(745)	(535)	(372)	(78)	(150)	—	(2,706)
Horizons-3 Satellite LLC Capital Contributions (3)	4,500	11,700	13,300					