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

Table of Contents

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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Table of Contents

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:

Table of Contents

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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Table of Contents

TABLE OF CONTENTS

		Page
Part I		
Forward-Looking Statements		1
Item 1	Identity of Directors, Senior Management and Advisors	2
Item 2	Offer Statistics and Expected Timetable	3
Item 3	Key Information	3
Item 3A	Selected Financial Data	3
Item 3B	Capitalization and indebtedness	5
Item 3C	Reasons for the offer and use of proceeds	5
Item 3D	Risk Factors	5
Item 4	Information on the Company	16
Item 4A	History and development of the company	16
Item 4B	Business Overview	17
Item 4C	Organizational Structure	39
Item 4D	Property, plant and equipment	39
Item 4A	Unresolved Staff Comments	40
Item 5	Operating and Financial Review and Prospects	40
Item 5A	Operating Results	49
Item 5B	Liquidity and capital resources	57
Item 5C	Research and development, patents and licenses	62
Item 5D	Trend information	62
Item 5E	Off-balance sheet arrangements	63
Item 5F	Tabular disclosure of contractual obligations	63
Item 5G	Safe Harbor	64
Item 6	Directors, Senior Management and Employees	64
Item 6A	Directors and senior management	64
Item 6B	Compensation of Executive Officers and Directors	66
Item 6C	Board practices	69
Item 6D	Employees	70
Item 6E	Share ownership	70
Item 7	Major Shareholders and Related Party Transactions	72
Item 7A	Major shareholders	72
Item 7B	Related party transactions	72
Item 7C	Interests of experts and counsel	72
Item 8	Financial information	72
Item 8A	Consolidated statements and other financial information	72
Item 8B	Significant changes	73
Item 9	The Offer and Listing	73
Item 9A	Offer and listing details	73
Item 9B	Plan of Distribution	73
Item 9C	Markets	73
Item 9D	Selling Shareholders	73
Item 9E	Dilution	73
Item 9F	Expenses of the Issue	73
Item 10	Additional Information	73

Item 10A	Share capital	73
Item 10B	Memorandum and articles of association	73
Item 10C	Material contracts	74

Table of Contents

		Page
Item 10D	Exchange controls	76
Item 10E	Taxation	76
Item 10F	Dividends and paying agents	79
Item 10G	Statements by experts	79
Item 10H	Documents on display	79
Item 10I	Subsidiary information	80
Item 11	Quantitative and Qualitative Disclosures about Market Risk	80
Item 12	Description of Securities Other than Equity Securities	81
Part II		
Item 13	Defaults, Dividend Arrearages and Delinquencies	81
Item 14	Material Modifications to the Rights of Security Holders and Use of Proceeds	81
Item 15	Controls and Procedures	81
Item 16	[Reserved]	81
Item 16A	Audit Committee Financial Expert	82
Item 16B	Code of Ethics	82
Item 16C	Principal Accountant Fees and Services	82
Item 16D	Exemptions from the Listing Standards for Audit Committees	82
Item 16E	Purchases of Equity Securities by the Issuer and Affiliated Purchasers	82
Item 16F	Change in Registrant’s Certifying Accountant	82
Item 16G	Corporate Governance	83
Item 16H	Mine Safety Disclosure	83
Part III		
Item 17	Financial Statements	83
Item 18	Financial Statements	83
Item 19	Exhibits	83
	Index to Exhibits	84
	Signatures	90
	Index to Consolidated Financial Statements	F- 1

Table of Contents

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;

Table of Contents

- 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.

Table of Contents

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.

Table of Contents

	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.

Table of Contents

(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.

Table of Contents

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.

Table of Contents

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;

Table of Contents

- 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

Table of Contents

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

Table of Contents

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

Table of Contents

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

Table of Contents

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

Table of Contents

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

Table of Contents

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.

Table of Contents

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.

Table of Contents

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,

2006, Intelsat

16

Table of Contents

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

Table of Contents

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

Table of Contents

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.

Table of Contents

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

Table of Contents

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

Table of Contents

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

Table of Contents

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

Table of Contents

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.

Table of Contents

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.

Table of Contents

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.

Table of Contents

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.

Table of Contents

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.

Table of Contents

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.

Table of Contents

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

Table of Contents

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.

Table of Contents

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

Table of Contents

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

Table of Contents

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

Table of Contents

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.

Table of Contents

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.

Table of Contents

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.

Table of Contents

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.

Table of Contents

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.

Table of Contents

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.

Table of Contents

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.

Table of Contents

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.

Table of Contents

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

Table of Contents

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.

Table of Contents

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

Table of Contents

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.

Table of Contents

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)

Table of Contents

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):

Table of Contents

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):

Table of Contents

	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:

Table of Contents

- 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

-

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.

Table of Contents

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

Table of Contents

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

Table of Contents

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

Table of Contents

- 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

Table of Contents

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):

Table of Contents

	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

Table of Contents

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

Table of Contents

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

Table of Contents

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

Table of Contents

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

Table of Contents

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.

Table of Contents

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)	1,106,021	1,087,911	1,090,157	1,077,549	884,871	641,556	—	5,888,065
Operating lease obligations	20,065	18,730	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	15,700	15,300	43,600	—	104,100
Purchase obligations (4)	414,452	254,106	163,548	38,353	35,813	89,420	—	995,692
Other long-term liabilities (including interest) (5)	59,783	50,021	49,220	38,503	27,053	131,136	—	355,716
Income tax contingencies (6)	—	—	—	—	—	—	29,144	29,144
Total contractual obligations	$1,603,995	$1,421,723	$1,751,741	$1,673,712	$7,099,896	$8,268,061	$29,144	$21,848,272

(1) Obligations related to our pension and postretirement medical benefit obligations are excluded from the table. We maintain a noncontributory defined benefit retirement plan covering substantially all of our employees hired prior to July 19, 2001. We expect that our future contributions to the defined benefit retirement plan will be based on the minimum funding requirements of the Internal Revenue Code and on the plan's funded status. The impact on the funded status is determined based upon market conditions in effect when we completed our annual valuation. In the

first quarter of 2015, we amended the defined benefit retirement plan to cease the accrual of additional benefits for the remaining active participants effective March 31, 2015. We anticipate that our contributions to the defined benefit retirement plan in 2019 will be approximately $5.1 million. We fund the postretirement medical benefits throughout the year based on benefits paid. We anticipate that our contributions to fund postretirement medical benefits in 2019 will be approximately $3.1 million. See Note 7—Retirement Plans and Other Retiree Benefits to our consolidated financial statements included elsewhere in this Annual Report.

(2) Represents estimated interest payments to be made on our fixed and variable rate debt. Interest payments for variable rate debt and incentive obligations have been estimated based on the current interest rates.

(3) See Note 10(b)—Investments—Horizons-3 Satellite LLC.

(4) Includes satellite construction and launch contracts, estimated payments to be made on performance incentive obligations related to certain satellites that are currently under construction, vendor contracts and customer commitments.

(5) Represents satellite performance incentive obligations related to satellites that are in service (and interest thereon).

(6) The timing of future cash flows from income tax contingencies cannot be reasonably estimated and therefore is reflected in the other column. See Note 14—Income Taxes to our consolidated financial statements included elsewhere in this Annual Report for further discussion of income tax contingencies.

Satellite Construction and Launch Obligations

As of December 31, 2018, we had approximately $694.4 million of expenditures remaining under our existing satellite construction contracts and satellite launch contracts. Satellite launch and in-orbit insurance contracts related to future satellites to be launched are cancelable up to thirty days prior to the satellite's launch. As of December 31, 2018, we did not have any non-cancelable commitments related to existing launch insurance or in-orbit insurance contracts for satellites to be launched.

See Item 4B—Business Overview—Our Network—Satellite Systems—Planned Satellites for details relating to certain of our satellite construction and launch contracts.

Table of Contents

Operating Leases

We have commitments for operating leases primarily relating to equipment and office facilities. These leases contain escalation provisions for increases. As of December 31, 2018, minimum annual rentals of all leases (net of sublease income on leased facilities), totaled approximately $158.7 million, exclusive of potential increases in real estate taxes, operating assessments and future sublease income.

Customer and Vendor Contracts

We have contracts with certain of our customers which require us to provide equipment, services and other support during the term of the related contracts. We also have long-term contractual obligations with service providers primarily related to the operation of certain of our satellites. As of December 31, 2018, we had commitments under these customer and vendor contracts which totaled approximately $301.3 million related to the provision of equipment, services and other support.

G. Safe Harbor

See the section entitled “Forward-Looking Statements” at the beginning of this Annual Report.

Item 6. Directors, Senior Management and Employees

A. Directors and Senior Management

Our current executive officers and directors are as follows:

Name	Age	Position
David McGlade	58	Director and Non-Executive Chairman, Intelsat S.A.
Stephen Spengler	59	Director and Chief Executive Officer, Intelsat S.A.
Michelle Bryan	62	Executive Vice President, General Counsel, Chief Administrative Officer and Secretary, Intelsat S.A.
Michael DeMarco	48	Executive Vice President, Operations, Intelsat US LLC
Samer Halawi	48	Executive Vice President & Chief Commercial Officer, Intelsat US LLC
Jacques Kerrest	72	Executive Vice President & Chief Financial Officer, Intelsat S.A.
Justin Bateman	45	Director, Intelsat S.A.
Robert Callahan	67	Director, Intelsat S.A.
John Diercksen	69	Director, Intelsat S.A.
Edward A. Kangas	74	Director, Intelsat S.A.
Raymond Svider	56	Director, Intelsat S.A.

The following is a brief biography of each of our executive officers and directors:

Mr. McGlade has been the Chairman of the board of directors of Intelsat S.A. since April of 2015, and prior to that served as Deputy Chairman of the Company and its predecessor from August 2008 to April 2015. In addition, Mr. McGlade served as the Chief Executive Officer of Intelsat S.A. and its predecessor from April 2005 to March 2015. Before joining Intelsat, Mr. McGlade was the Chief Executive Officer of O2 UK, the largest subsidiary of O2 plc and a leading U.K. cellular telephone company, a position he took in October 2000. He was also an Executive Director of O2 plc. During his tenure at O2 UK and O2 plc, Mr. McGlade was a director of the GSM Association, a trade association for GSM mobile operators, and served as Chairman of its Finance Committee from February 2004 to February 2005. He was also a director of Tesco Mobile from September 2003 to March 2005 and a director of The Link, a distributor of mobile phones and other high technology consumer merchandise, from December 2000 to May 2004. Mr. McGlade is currently a director of Skyworks Solutions, Inc., an innovator of high performance analog semiconductors , and is currently the first vice chairman of the board of the EMEA Satellite Operators Association (ESOA), a trade organization that serves and promotes the common interests of EMEA satellite operators.

Mr. McGlade holds a Bachelor of Arts degree from Rutgers University. Mr. McGlade’s business address is 4, rue Albert Borschette, L-1246 Luxembourg.

Mr. Spengler became the Chief Executive Officer of Intelsat S.A. on April 1, 2015, and became a director of Intelsat S.A. in October 2015. Prior to April 2015, Mr. Spengler served as Deputy Chief Executive Officer of Intelsat S.A. from December 2014, and prior to that he served as President and Chief Commercial Officer of Intelsat US LLC (f/k/a Intelsat Corporation) from March 2013 to December 2014. Mr. Spengler also served as Executive Vice President, Sales, Marketing and Strategy of

Table of Contents

Intelsat US LLC from February 2008 to March 2013. Before joining Intelsat in 2003, Mr. Spengler held various positions in the telecommunications industry, including Senior Vice President of Global Sales, Broadband Access Networks at Cirronet, Inc., Vice President of Sales and Marketing at ViaSat Satellite Networks, Regional Sales Director for Satellite Networks in Europe, the Middle East and Africa for Scientific-Atlanta Europe based in London, and sales and marketing positions at GTE Spacenet and GTE Corporation. Mr. Spengler received his Bachelor of Arts degree from Dickinson College in Carlisle, Pennsylvania, and his Masters of Business Administration from Boston University in Massachusetts. Mr. Spengler's business address is 4, rue Albert Borschette, L-1246 Luxembourg.
Ms. Bryan became the Executive Vice President, General Counsel and Chief Administrative Officer and Secretary of Intelsat S.A. in March 2013. Prior to that, Ms. Bryan served as Senior Vice President, Human Resources and Corporate Services of Intelsat US LLC since January 2007. Prior to joining Intelsat, Ms. Bryan served as General Counsel and Corporate Secretary for Laidlaw International, and prior to that held a number of executive positions with US Airways Group, Inc. including Executive Vice President, Corporate Affairs and General Counsel and Corporate Secretary, as well as Senior Vice President of Human Resources. Ms. Bryan earned a Bachelor of Arts degree from the University of Rochester and a Juris Doctor from Georgetown University. Ms. Bryan's business address is 4, rue Albert Borschette, L-1246 Luxembourg.

Mr. DeMarco became the Executive Vice President, Operations of Intelsat US LLC in August 2017. Prior to that, Mr. DeMarco served as Senior Vice President, Operations since April 2015, and prior to that as Senior Vice President, Product and Asset Management, with responsibility for product management, marketing, customer solutions engineering and asset management functions. From 2006 to 2009 he served as Intelsat US LLC's Vice President of Media Services and has held roles of increasing responsibility within the Company, serving as Vice President of Core Video Services, Senior Director of Business Operations, and Director of Product Finance at PanAmSat prior to its 2006 merger with Intelsat. Since November 2017, he has also served as director of Dejero Labs, Inc., a provider of connectivity required for cloud computing, online collaborations, and the secure exchange of video and data.
Mr. DeMarco earned a Bachelor of Science Degree in Finance and a Masters of Business Administration from Fairfield University in Connecticut. Mr. DeMarco's business address is 7900 Tysons One Place, McLean, VA 22102, United States.
Mr. Halawi became the Executive Vice President and Chief Commercial Officer of Intelsat S.A. on January 9, 2018. Prior to joining Intelsat, Mr. Halawi served as Chief Commercial Officer for WorldVu Satellites Limited ("OneWeb") from April 2017 to January 2018, where he established and oversaw the distribution, product management, communications, business development, strategy, and sales and marketing functions. From 2011 to 2017, he served as Chief Executive Officer for Thuraya Telecommunications Company, a leader in mobile satellite services, with responsibility for performance, positioning and growth of the company. Mr. Halawi previously spent eight years at Inmarsat PLC in global strategy, running operations for the Middle East, Africa and Asia-Pacific. He also held prior roles in the telecommunications industry at Flag Telecom and ICO Global Communications ("ICO"), including a three year period in investment banking in the Middle East while at ICO. Mr. Halawi began his career in the automotive industry, occupying several positions with Chrysler Corporation and Ford Motor Company. He is currently a director of OmniSpace LLC, a mobile satellite services provider. He holds a Bachelor of Science degree in Electrical Engineering from Lawrence Technological University in Michigan, and a Masters of Business Administration from the University of Michigan. Mr. Halawi's business address is 7900 Tysons One Place, McLean, VA 22102, United States.
Mr. Kerrest became the Executive Vice President and Chief Financial Officer of Intelsat S.A. on February 1, 2016. Prior to this, Mr. Kerrest served as President of DPC Data Inc., a data products and specialized data services company, from July 2014 to February 2016, and has been serving as a director of that company since 2011. From 2008 to 2011, Mr. Kerrest served as Chief Financial Officer and Chief Operating Officer of ActivIdentity Corporation, an identity assurance provider. He also served as the Chief Financial Officer of Virgin Media plc, the second largest communications company in the United Kingdom, from 2004 to 2008. Prior to 2004, Mr. Kerrest held the role of

Chief Financial Officer at companies including Equant Inc., Harte-Hanks, Inc., Chancellor Broadcasting Company and Positive Communications. Since June 2017, he also serves as a director of Comscore, Inc., a cross-platform measurement company that measures audiences, brands and consumer behavior. Mr. Kerrest has notified us that he intends to retire in the spring of 2019. Mr. Kerrest received his Masters of Science degree from Faculte Des Sciences Economiques in Paris, France, and a Masters of Business Administration from Institut D'Etudes Politiques De Paris in Paris, France as well as the Thunderbird School of Global Management in Glendale, Arizona. Mr. Kerrest's business address is 4, rue Albert Borschette, L-1246 Luxembourg.

Mr. Bateman became a director of Intelsat S.A. in July 2011. Mr. Bateman also served as a director of Intelsat Investments S.A. from August 2008 to May 2013. Mr. Bateman is a Partner of BC Partners based in its New York office, the investment arm of which he co-established in early 2008. He initially joined BC Partners' London office in 2000 from PricewaterhouseCoopers, where he spent three years in Transaction Services working on projects for both financial investors and corporate clients. In 2002/2003 he left BC Partners to complete his MBA at INSEAD before rejoining its London office.

Table of Contents

Mr. Bateman serves on the board of Cyxtera Technologies, Inc., Teneo Global LLC, and Zest Dental Holdings Inc. He has previously served on the boards of Office Depot, Inc., MultiPlan, Inc. and Suddenlink Communications. He has a degree in economics from the University of Cambridge in the UK. Mr. Bateman's business address is 4, rue Albert Borschette, L-1246 Luxembourg.

Mr. Callahan became a director of Intelsat S.A. in April 2014. Mr. Callahan is the Chairman of Longueview Advisory, a media, internet and technology advisory firm. Prior to joining Longueview, he served as a special advisor with General Atlantic, Inc., a leading global growth equity firm, where he worked on internet, technology and resource investments, such as the Alibaba Group and Network Solutions, Inc., where he served as Chairman. He previously held the position of Chairman and Chief Executive Officer of Ziff Davis Media, Inc. Mr. Callahan also spent 20 years at the Walt Disney Company/ABC/Capital Cities, where he held numerous positions, including President of ABC Inc. Mr. Callahan holds a Bachelor of Science degree in Journalism from the University of Kansas. Mr. Callahan's business address is 4, rue Albert Borschette, L-1246 Luxembourg.

Mr. Diercksen became a director of Intelsat S.A. in September 2013. Mr. Diercksen serves as a Senior Advisor at LionTree Investment Advisors, addressing financial, operational and management services with client business development. From December 2015 to June 2017, Mr. Diercksen served as the Chief Executive Officer of Beachfront Wireless. Previously, Mr. Diercksen retired from Verizon Communications as the executive vice president for strategy, development and planning in September 2013, with responsibility for key strategic initiatives related to the review and assessment of potential mergers, acquisitions and divestitures. Earlier in his career, Mr. Diercksen held a number of senior financial and leadership positions at Verizon, Bell Atlantic, and NYNEX, among other companies. Mr. Diercksen also serves on the boards of Cyxtera Technologies, Inc. and Banco Popular, Inc. and previously served on the board of Harman International Industries. Mr. Diercksen holds an MBA from Pace University and a Bachelor of Business Administration in finance from Iona College. Mr. Diercksen also qualifies as an audit committee financial expert. Mr. Diercksen's business address is 4, rue Albert Borschette, L-1246 Luxembourg.

Mr. Kangas became a director of Intelsat S.A. in July 2012. He also serves as Chairman of the board of directors of Deutsche Bank USA Corp., the U.S. holding company of Deutsche Bank AG. Mr. Kangas serves as Lead Director of Tenet Healthcare Corporation, where he previously served as Non-Executive Chairman (and member of the Compensation Committee) from 2003 to 2015. Mr. Kangas also serves as Lead Director of United Technologies Corporation, and serves as a member of the board of directors of Hovnanian Enterprises, Inc. (and member of the Compensation, Audit and Governance and Nominating Committees) and Vivus, Inc. (and member of the Compensation Committee). He also formerly served as a director of Intuit, Inc. and Electronic Data Systems Corp. Mr. Kangas previously served as Global Chairman and Chief Executive Officer of Deloitte, Touche, Tohmatsu from 1989 to 2000. He also served as the managing partner of Deloitte & Touche (USA) from 1989 to 1994. Mr. Kangas holds a bachelor's degree in business and an MBA from the University of Kansas and is a Certified Public Accountant. Mr. Kangas also qualifies as an audit committee financial expert. Mr. Kangas' business address is 4, rue Albert Borschette, L-1246 Luxembourg.

Mr. Svider became a director of Intelsat S.A. in July 2011. Prior to April 2013, Mr. Svider also served as Chairman of the board of directors. Mr. Svider was a director of Intelsat Investments S.A. from February 2008 to May 2013 and became the Chairman of the board of directors of Intelsat S.A. in May 2008. Mr. Svider has been Co-Chairman of BC Partners since December 2008 and has been a Managing Partner of BC Partners since 2003. He joined BC Partners in 1992 in Paris before moving to London in 2000 to lead its investments in the technology and telecommunications industries. Over the years, Mr. Svider has participated in or led a variety of investments, including Tubesca, Nutreco, UTL, Neopost, Polyconcept, Neuf Telecom, Unity Media/Tele Columbus, Office Depot Inc., ATI Enterprises, MultiPlan, Inc., Suddenlink Communications, Accudyne Industries, Teneo Global LLC and PetSmart. He is currently on the board of Altice USA, Accudyne Industries, Teneo Global LLC, PetSmart, Navex Global and GFL Environmental. Prior to joining BC Partners, Mr. Svider worked in investment banking at Wasserstein Perella in New York and Paris, and at the Boston Consulting Group in Chicago. Mr. Svider holds a Master of Business

Administration from the University of Chicago and a Master of Science in Engineering from both École Polytechnique and École Nationale Superieure des Telecommunications in France. Mr. Svider's business address is 4, rue Albert Borschette, L-1246 Luxembourg.

B. Compensation of Officers and Directors

This section sets forth (i) the compensation and benefits provided to our executive officers and directors for 2018, (ii) a description of the bonus program in which our executive officers participated in 2018, (iii) the total amounts set aside or accrued in 2018 for pension, retirement and similar benefits for our executive officers, and (iv) the number, exercise price and expiration date of share option grants made during 2018.

Table of Contents

2018 Compensation

For 2018, our executive officers received total compensation, including base salary, bonus, non-equity incentive compensation, equity-related income, contributions to the executive officer's account under our 401(k) plans and other retirement plans and certain perquisites, equal to $38 million in the aggregate.

Annual Cash Bonuses

In April 2013, our board of directors adopted, and our shareholders approved, a Bonus Plan (the "Bonus Plan") which provides that certain of our and our subsidiaries' employees, including the executive officers, may be awarded cash bonuses based on the attainment of specific performance goals and business criteria established by our board of directors for participants in the Bonus Plan. The goals and criteria for the 2018 fiscal year included certain financial metrics, including revenue and adjusted EBITDA targets, as well as certain management objectives, all as defined by the compensation committee. The bonus target percentages for our executives are set forth in their respective employment agreements. Awards for the subject year are determined based upon completion of the audited consolidated financial statements for that year. The Bonus Plan is a discretionary plan and the compensation committee retains the right to award compensation absent the attainment of performance criteria.

The Bonus Plan enables the compensation committee to grant bonuses that are intended to qualify as performance-based compensation for purposes of Section 162(m) of the United States Internal Revenue Service Tax Code (the "Code") by conditioning the payout of the bonus on the satisfaction of certain performance goals (which are selected from the same list of performance goals applicable under our 2013 Equity Plan (see "—2013 Equity Incentive Plan" below)). In addition, the Bonus Plan also provides that, except to the extent otherwise provided in an award agreement, or any applicable employment, change in control, severance or other agreement between a participant and the Company, in the event of a change in control (as defined in our 2013 Equity Plan), the compensation committee may provide that all or a portion of any such bonus award will become fully vested based on (i) actual performance through the date of the change in control, as determined by the compensation committee or (ii) if the compensation committee determines that measurements of actual performance cannot be reasonably assessed, the assumed achievement of target performance as determined by the compensation committee. All awards previously deferred will be settled in full upon, or as soon as practicable following, the change in control.

Pension, Retirement and Similar Benefits

Our executive officers participate in a tax-qualified 401(k) plan on the same terms as our other employees. Our executive officers also participate in the Intelsat Excess Benefit Plan, a nonqualified retirement plan under which our executive officers and certain key employees receive additional contributions to address limitations placed on contributions under the tax-qualified 401(k) plan. Under the terms of his employment agreement, Mr. McGlade is provided with certain retiree medical benefits that are not otherwise provided to participants under the terms of our medical plan. The aggregate amount of the employer contributions to the 401(k) plans and the Intelsat Excess Benefit Plan for our executive officers during 2018 was $16,019. Total present value of Mr. McGlade's post-retirement medical benefits was $89,870.

Employment Agreements and Severance Protection

We have entered into employment agreements with each of our executive officers. Among other things, the employment agreements provide for minimum base salary, bonus eligibility and severance protection in the event of involuntary terminations of employment. Specifically, under the employment agreements, if the executive officer's employment is terminated by us without cause or if the officer resigns for good reason (in either case, as defined in the executive officer's respective employment agreement), then, subject to the executive officer's execution of a release of claims and compliance with certain restrictive covenants, the executive officer will be paid a severance amount on the sixtieth day after such termination of employment equal to the product of (x) the sum of the executive officer's annual base salary and target annual bonus as in effect on the date of such termination of employment, multiplied by (y) a severance multiplier equal to 2.0 in the case of Mr. Spengler, and 1.5 in the case of Messrs. DeMarco, Halawi, and Kerrest and Ms. Bryan. Mr. McGlade's employment agreement terminated on March 31, 2018, after which he

transitioned to a non-executive chairman of the board.

Director Compensation

We provide non-executive members of the board with compensation (including equity based compensation) for their service on the board and any committees of the board. We do not provide any compensation to members of the board elected as representatives of an entity that is a sponsor shareholder. The director compensation policy provides that each director eligible for compensation (an “outside director”) receives an annual board cash retainer of $75,000 (the “basic cash retainer”). Effective

Table of Contents

April 1, 2018 Mr. McGlade became an outside director eligible for compensation under the director compensation policy. In addition to the basic cash retainer, Mr. McGlade received an additional annual cash retainer of $50,000 for serving as the chairman of the board. The chairman of the Audit Committee receives an annual cash retainer of $22,500 and each other member of the Audit Committee receives an annual cash retainer of $15,000. The chairman of the Compensation Committee receives an annual cash retainer of $17,500 and each other member of the Compensation Committee receives an annual cash retainer of $10,000. Effective January 1, 2019, the board of directors established a Nominating and Governance Committee. The chairman of the Nominating and Governance Committee receives an annual cash retainer of $10,000 and each other member of the Nominating and Governance Committee receives an annual cash retainer of $5,000. In addition, each outside director receives an annual restricted stock unit award (pursuant to the 2013 Equity Incentive Plan) with a grant date value of approximately $125,000, or $175,000 in the case of the chairman of the board, that vests on the first anniversary of the date of grant, subject to continued service on the board of directors on such vesting date, and subject to such other terms and conditions as established by the board of directors from time to time.

Each outside director may elect to receive any of the foregoing cash retainers in the form of fully vested restricted share unit ("RSU") awards with a grant date value equal to the amount of such cash retainer, subject to such terms and conditions as established by the board of directors from time to time.

Other than the severance protection provided under the employment agreement of Mr. Spengler described above, no directors are party to service contracts with the Company providing for benefits upon termination of employment or service.

Non-executive members of the board are entitled to reimbursements for travel and other out-of-pocket expenses related to their board service.

Pursuant to a governance agreement (the "Governance Agreement") we are party to with the shareholder affiliated with BC Partners (the "BC Shareholder"), we have agreed to reimburse directors nominated by the BC Shareholder for travel and other expenses related to their board and committee service.

Equity Grants issued during 2018

In 2018, we granted a total of 951,000 RSUs to our executive officers as a group and 28,600 RSUs to our outside directors pursuant to the 2013 Equity Plan (—see Equity Compensation Plans below). The units granted to the executive officers included both time-vesting restricted stock units as well as performance-based restricted stock units which vest on the basis of achievement of certain financial metrics. The units grants to the outside directors are time-vesting restricted stock units which vest on the anniversary of the grant date.

Equity Compensation Plans

2008 Share Incentive Plan

On May 6, 2009, the board of directors of Intelsat Global S.A. adopted the amended and restated Intelsat Global, Ltd. 2008 Share Incentive Plan (the "2008 Equity Plan"). Intelsat S.A. adopted the 2008 Equity Plan by an amendment effective as of March 30, 2012. The 2008 Equity Plan provides for a variety of equity-based awards with respect to our common shares, including non-qualified share options, incentive share options (within the meaning of Section 422 of the Code), restricted share awards, restricted share unit awards, share appreciation rights, phantom share awards and performance-based awards. While certain awards remain outstanding under the 2008 Equity Plan, no new awards may be granted under the 2008 Equity Plan.

In addition, in connection with the IPO, each of our executive officers agreed to cancel a portion of their unvested performance options in exchange for grants of new stock options and restricted share units granted to our executive officers under the 2013 Equity Incentive Plan.

Except for certain grants of restricted shares and stock options made immediately following the IPO, following the consummation of the IPO no new awards may be granted under the 2008 Equity Plan.

2013 Equity Incentive Plan

In connection with the IPO, we established the Intelsat S.A. 2013 Equity Incentive Plan (the “2013 Equity Plan”). Any of the employees, directors, officers, consultants or advisors (or prospective employees, directors, officers, consultants or advisors) of the Company or any of our subsidiaries or their respective affiliates, are eligible for awards under the 2013 Equity Plan. The compensation committee has the authority to determine who is granted an award under the 2013 Equity Plan, and it

Table of Contents

has delegated authority to the Chief Executive Officer of the Company to make awards to individuals below the executive officer level, subject to reporting such awards to the compensation committee at the next following committee meeting.
No more than 20,000,000 of our common shares in the aggregate may be issued with respect to incentive stock options under the 2013 Equity Plan. No participant may be granted awards in any one calendar year with respect to more than 1,500,000 of our common shares in the aggregate (or the equivalent amount in cash, other securities or property).

Our common shares subject to awards are generally unavailable for future grant. If any shares are surrendered or tendered to pay the exercise price of an award or to satisfy withholding taxes owed, such shares will not be available for grant under the 2013 Equity Plan. If any award granted under the 2013 Equity Plan expires, terminates, is canceled or forfeited without being settled or exercised, our common shares subject to such award will again be made available for future grant.
The compensation committee may grant awards of non-qualified stock options, incentive (qualified) stock options, stock appreciation rights, restricted stock awards, restricted stock units, other stock-based awards, performance compensation awards (including cash bonus awards), or any combination of the foregoing. Awards may be granted under the 2013 Equity Plan and in assumption of, or in substitution for, outstanding awards previously granted.

C. Board Practices

Board Leadership Structure

Our board of directors consists of seven directors. Our articles of incorporation provide that our board of directors shall consist of not less than three directors and not more than twenty directors. Under Luxembourg law, directors are appointed by the general meeting of shareholders for a period not exceeding six years or until a successor has been elected. Our board is divided into three classes as described below. Pursuant to our articles of incorporation, our directors are appointed by the general meeting of shareholders for a period of up to three years (or, if longer, up to the annual meeting held following the third anniversary of the appointment), with each director serving until the third annual general meeting of shareholders following their election. Upon the expiration of the term of a class of directors, directors in that class will be elected for three-year terms at the annual general meeting of shareholders in the year in which their term expires. Messrs. Svider and Bateman are serving as Class I directors for a term expiring in 2020. Messrs. Spengler, McGlade and Callahan are serving as Class II directors for a term expiring in 2021. Messrs. Kangas and Diercksen are serving as Class III directors for a term expiring in 2019. Mr. McGlade serves as the Chairman of our board of directors.

Audit Committee

Intelsat S.A. has an audit committee consisting of Messrs. Kangas, Diercksen and Callahan. All members of the audit committee are independent directors. Pursuant to its charter and the authority delegated to it by the board of directors, the audit committee has sole authority for the engagement, compensation and oversight of our independent registered public accounting firm. In addition, the audit committee reviews the results and scope of the audit and other services provided by our independent registered public accounting firm, and also reviews our accounting and control procedures and policies. The audit committee meets as often as it determines necessary but not less frequently than once every fiscal quarter. Our board of directors has determined that each of Messrs. Kangas and Diercksen is an audit committee financial expert.

Compensation Committee

Intelsat S.A. has a compensation committee consisting of Messrs. Svider, Diercksen and Kangas. Messrs. Diercksen and Kangas are independent, and Mr. Svider is not independent, since he is associated with the Sponsor. Pursuant to its charter and the authority delegated to it by the board of directors, the compensation committee has responsibility for the approval and evaluation of all of our compensation plans, policies and programs as they affect Intelsat S.A.'s chief executive officer and other executive officers. The compensation committee meets as often as it determines

necessary.

Nominating & Governance Committee

Intelsat S.A. has a nominating & governance committee consisting of Messrs. McGlade, Bateman, Callahan and Kangas. Messrs. Callahan and Kangas are independent, and Mr. McGlade is not independent, since he served as our chief executive officer within the past three years, and Mr. Bateman is not independent, since he is associated with the Sponsor. Pursuant to its charter and the authority delegated to it by the board of directors, the nominating & governance committee has responsibility for recommending to the board individuals qualified to serve as directors and on committees of the board; to advise the board

Table of Contents

with respect to the board composition, procedures and committees; and to develop and recommend to the board a set of corporate governance principles applicable to the Company. The nominating & governance committee meets as often as it determines necessary but not less frequently than twice annually.

D. Employees

As of December 31, 2018, we had 1,187 full-time regular employees. These employees consisted of:

- 609 employees in engineering, operations and related information systems;
- 194 employees in finance, legal and other administrative functions;
- 298 employees in sales, marketing and strategy; and
- 86 employees in support of government sales and marketing.

We believe that our relations with our employees are good. None of our employees is represented by a union or covered by a collective bargaining agreement.

E. Share Ownership

The following table and accompanying footnotes show information regarding the beneficial ownership of our common shares by:

- each person known by us to beneficially own 5% or more of our outstanding common shares;
- each of our directors;
- each executive officer, subject to permitted exceptions; and
- all directors and executive officers as a group.

The percentage of beneficial ownership set forth below is based on approximately 138,073,226 common shares issued and outstanding as of February 12, 2019. All common shares listed in the table below are entitled to one vote per share, unless otherwise indicated in the notes thereto. Unless otherwise indicated, the address of each person named in the table below is c/o Intelsat S.A., 4, rue Albert Borschette, L-1246 Luxembourg.

	Common Shares Beneficially Owned(1)	
Name of Beneficial Owner:	Number	Percentage
Serafina S.A.(2)(12)	56,774,455	41.1 %
Silver Lake Group, L.L.C.(3)(12)	12,380,437	9.0 %
SLP III Investment Holdings S.à r.l.(3)(12)	12,102,657	8.8 %
Point State Capital LP and related entities(4)	10,953,321	7.9 %
David McGlade(5)(12)	4,537,793	3.2 %
Stephen Spengler(6)	1,440,163	1.0%
Michelle Bryan(7)	328,700	*
Michael DeMarco(8)	151,500	*
Samer Halawi(9)	31,573	*
Jacques Kerrest(10)	741,209	*
Justin Bateman	—	*
Robert Callahan	20,124	*
John Diercksen	90,115	*
Edward Kangas	90,121	*
Raymond Svider	—	*
Directors and executive officers as a group(11) (11 persons)	7,431,298	5.2%

*Represents beneficial ownership of less than one percent of shares outstanding.

(1) The amounts and percentages of our common shares beneficially owned are reported on the basis of regulations of the U.S. Securities and Exchange Commission (the "SEC") governing the determination of beneficial ownership of

Table of Contents

securities. Under the rules of the SEC, a person is deemed to be a "beneficial owner" of a security if that person has or shares "voting power," which includes the power to vote or to direct the voting of such security, or "investment power," which includes the power to dispose of or to direct the disposition of such security. A person is also deemed to be a beneficial owner of any securities of which that person has a right to acquire beneficial ownership within 60 days. Under these rules, more than one person may be deemed to be a beneficial owner of such securities as to which such person has an economic interest.

(2) The common shares beneficially owned by Serafina S.A. are also beneficially owned by the limited partnerships comprising the fund commonly known as BC European Capital VIII, BC European Capital—Intelsat Co-Investment and BC European Capital—Intelsat Co-Investment 1. CIE Management II Limited is the general partner of, and has investment control over the shares beneficially owned by, each of the limited partnerships comprising the BC European Capital VIII fund that are domiciled in the United Kingdom, BC European Capital—Intelsat Co-Investment, and BC European Capital—Intelsat Co-Investment 1 (collectively, the "CIE Funds"). CIE Management II Limited may, therefore, be deemed to have shared voting and investment power over the common shares beneficially owned by each of the CIE Funds. LMBO Europe SAS is the Gerant of, and has investment control over the shares beneficially owned by, each of limited partnerships comprising the BC European Capital VIII fund that are domiciled in France (collectively, the "LMBO Funds"). LMBO Europe SAS may, therefore, be deemed to have shared voting and investment power over the common shares beneficially owned by each of the LMBO Funds. Because each of CIE Management II Limited and LMBO Europe SAS is managed by a board of directors, no individuals have ultimate voting or investment control for purposes of Section 13(d)(3) of the Securities Exchange Act of 1934, as amended (the "Act"), over the shares that may be deemed beneficially owned by CIE Management II Limited or LMBO Europe SAS. The address of Serafina S.A. is 29, avenue de la Porte Neuve, L-2227 Luxembourg. The address of CIE Management II Limited and the CIE Funds is Heritage Hall, Le Marchant Street, St. Peter Port, Guernsey, GY1 4HY, Channel Islands and the address of LMBO Europe SAS and the LMBO Funds is 58-60 Avenue Kleber, Paris, France 75116.

(3) The common shares held of record by SLP III Investment Holding S.à r.l. are beneficially owned by its shareholders Silver Lake Partners III, L.P. ("SLP") and Silver Lake Technology Investors III, L.P. ("SLTI"). Silver Lake Technology Associates III, L.P. ("SLTA") serves as the general partner of each of SLP and SLTI and may be deemed to beneficially own the shares directly owned by SLP and SLTI. SLTA III (GP), L.L.C. ("SLTA GP") serves as the general partner of SLTA and may be deemed to beneficially own the shares directly owned by SLP and SLTI. Silver Lake Group, L.L.C. ("SLG") serves as the managing member of SLTA GP and may be deemed to beneficially own the shares directly owned by SLP and SLTI. The address for each of SLP, SLTI, SLTA, SLTA GP and SLG is 2775 Sand Hill Road, Suite 100, Menlo Park, CA 94025.

(4) Based on the most recently available Schedule 13G/A filed with the SEC on February 14, 2019 by PointState Capital LP ("PointState"), PointState reports that it serves as the investment manager to SteelMill Master Fund LP ("SteelMill"), PointState Holdings LLC ("PointState Holdings") serves as the general partner of SteelMill, PointState Capital GP LLC ("PointState GP") serves as the general partner of PointState, and Zachary J. Schreiber ("Mr. Schreiber") serves as managing member of PointState GP and PointState Holdings. PointState reports that SteelMill, PointState Holdings, PointState, PointState GP and Mr. Schreiber (collectively, the "Reporting Persons") filed a Schedule 13G/A jointly with respect to the same securities as contemplated by Rule 13d-1(k)(1) under the U.S. Securities Exchange Act of 1934 (the "Exchange Act"), and not as members of a group. PointState further reports that PointState, as investment manager to SteelMill, and Mr. Schreiber, as managing member of PointState GP and PointState Holdings, may be deemed to beneficially own, within the meaning of Section 13(d) of the Exchange Act and the rules and regulations thereunder, the common shares of Intelsat S.A. held directly by SteelMill. The address of each of the Reporting Persons is care of PointState Capital LP, 40 West 57th Street, 25th Floor, New York, New York 10019.

(5) Includes common shares held by McGlade Investments II, LLC, the Article 4 Family Trust U/T David McGlade 2009 GRAT and the David P. McGlade Declaration of Trust. Mr. McGlade exercises voting power over a total of

2,497,181 common shares. Mr. McGlade also holds restricted share units and options entitling him to receive or purchase 2,040,612 common shares within sixty days of February 12, 2019.

(6) Mr. Spengler exercises voting power over 581,913 common shares and holds restricted share units and options entitling him to receive or purchase 858,250 common shares within sixty days of February 12, 2019. A portion of these shares, restricted share units and options is subject to vesting and other restrictions.

(7) Ms. Bryan exercises voting power over 97,450 common shares and holds restricted share units and options entitling her to receive or purchase 231,250 common shares within sixty days of February 12, 2019. A portion of these restricted share units and options is subject to vesting and other restrictions.

(8) Mr. DeMarco exercises voting power over 30,000 shares and holds restricted share units and options entitling him to receive or purchase 121,500 common shares within sixty days of February 12, 2019. A portion of these shares, restricted share units and options is subject to vesting and other restrictions.

(9) Mr Halawi exercises voting power over 6,573 shares and holds restricted share units and options entitling him to receive or purchase 25,000 shares within 60 days of February 12, 2019. A portion of these restricted share units and options is subject to vesting and other restrictions.

Table of Contents

(10) Mr. Kerrest exercises voting power over 207,709 shares and holds restricted share units and options entitling him to receive or purchase 533,500 common shares within sixty days of February 12, 2019. A portion of these restricted share units and options is subject to vesting and other restrictions.

(11) Directors and executive officers as a group exercise voting power over 3,621,186 common shares and hold restricted share units and options entitling them to receive or purchase 3,810,112 common shares within sixty days of February 12, 2019 under applicable vesting schedules.

(12) Under our Governance Agreement and Shareholders Agreement, Serafina S.A. currently has the right to nominate two directors for election to our board of directors and Serafina S.A., Silver Lake entities and Mr. McGlade and his affiliated trusts and entities have certain drag along and tag along rights. As a result, Serafina S.A. and certain related parties named in footnote (2) above, SLP III Investment Holdings S.à r.l. and certain related parties named in footnote (3) above and David McGlade may be deemed to constitute a "group" that beneficially owns approximately 52.6% of our common shares for purposes of Section 13(d)(3) of the Act. Each of Serafina S.A., SLP III Investment Holdings S.à r.l., their respective related parties and David McGlade disclaim beneficial ownership of any common shares held by each other.

Item 7. Major Shareholders and Related Party Transactions

A. Major Shareholders

See Item 6E—Share Ownership.

B. Related Party Transactions

See Item 10C - Material Contracts. Also, in June 2018, in a public offering of approximately 15.5 million Common Shares by the Company, funds controlled by BC Partners, our largest beneficial owner, purchased an additional 2,021,563 Common Shares at the public offering price of $14.84 per Common Share.

C. Interests of experts and counsel

Not applicable.

Item 8. Financial Information

A. Consolidated Statements and Other Financial Information

Our consolidated financial statements are filed under this item, beginning on page F-1 of this Annual Report on Form 20-F. The financial statement schedules required under Regulation S-X are filed pursuant to Item 18 and Item 19 on Form 20-F.

Legal Proceedings

We are subject to litigation in the ordinary course of business, but management does not believe that the resolution of any pending proceedings would have a material adverse effect on our financial position or results of operations.

Dividend Policy

We do not expect to pay dividends or other distributions on our common shares in the foreseeable future. We currently intend to retain any future earnings for working capital and general corporate purposes, which could include the financing of operations or the repayment, redemption, retirement or repurchase in the open market of our indebtedness. Under Luxembourg law, the amount and payment of dividends or other distributions is determined by a simple majority vote at a general shareholders' meeting based on the recommendation of our board of directors, except in certain limited circumstances. Pursuant to our articles of incorporation, the board of directors has the power to pay interim dividends or make other distributions in accordance with applicable Luxembourg law. Distributions may be lawfully declared and paid if our net profits and/or distributable reserves are sufficient under Luxembourg law. All of our common shares rank pari passu with respect to the payment of dividends or other distributions unless the right to dividends or other distributions has been suspended in accordance with our articles of incorporation or applicable law. Under Luxembourg law, up to 5% of our net profits per year must be allocated to the creation of a legal reserve until such reserve has reached an amount equal to 10% of our issued share capital. The allocation to the legal reserve becomes

Table of Contents

compulsory again when the legal reserve no longer represents 10% of our issued share capital. The legal reserve is not available for distribution.
We are a holding company and have no material assets other than our indirect ownership of shares in our operating subsidiaries. If we were to pay a dividend or other distribution on our common shares at some point in the future, we would cause the operating subsidiaries to make distributions to us in an amount sufficient to cover any such dividends. Our subsidiaries' ability to make distributions to us is restricted under certain of their debt and other agreements.

B. Significant Changes
No significant change has occurred since the date of the annual financial statements included in this Annual Report on Form 20-F.

Item 9. The Offer and Listing
A. Offering and Listing Details
Since our IPO on April 23, 2013, our common shares have traded on the NYSE under the symbol "I".

B. Plan of Distribution
Not applicable.

C. Markets
See Item 9A—Offering and Listing Details.

D. Selling Shareholders
Not applicable.

E. Dilution
Not applicable.

F. Expenses of the Issue
Not applicable.

Item 10. Additional Information

A. Share Capital
Not applicable.

B. Memorandum and Articles of Association

Table of Contents

A copy of our amended and restated consolidated articles of incorporation is being filed as an exhibit to this Annual Report, and is incorporated herein by reference. The information called for by this Item 10B—"Additional Information—Memorandum and Articles of Association" has been reported previously in our Registration Statement on Form F-1, as amended (File No. 333- 181527), initially filed with the SEC on May 18, 2012, under the heading "Description of Share Capital," and in our Annual Report on Form 20-F as amended (File No. 001-35878), initially filed with the SEC on February 26, 2018, under the heading "Additional Information – Memorandum and Articles of Association," and is incorporated by reference into this Annual Report. There are no limitations on the rights to own securities, including the rights of non-resident or foreign shareholders to hold or exercise voting rights on the securities imposed by the laws of Luxembourg or by our articles of incorporation.

C. Material Contracts

The following is a summary of each material contract, other than material contracts entered into in the ordinary course of business, to which we are a party, for the two years immediately preceding the date of this Annual Report:

Employment Agreements and Other Arrangements

See summary of Employment Agreements provided under Item 6B above. From time to time, we also enter into other compensation agreements and retention mechanisms with our executive officers.

Equity Compensation Agreements

Equity Grant Agreements under 2008 Equity Plan

Certain of our executive officers hold options granted under the 2008 Equity Plan that are subject to forfeiture and other restrictions as set forth in the executive officers' respective award agreements.

Option and Restricted Share Unit Agreements under 2013 Equity Plan

Certain of our executive officers hold restricted share units ("RSUs") and option agreements under our 2013 Equity Plan that vest as follows:

- RSUs which vest based on continued service or achievement of one or more long-term performance and financial metrics over one to three years; and
- options to purchase common shares at exercise prices of $3.29 per share and $3.77 per share, which are fully vested or vest based on continued service over 2 to 3 years and expire on the 10th anniversary of the date of grant.

New Governance Agreement

In December 2018, we entered into a new governance agreement (the "New Governance Agreement") with Serafina S.A. (the "BC Shareholder"). Key terms of the New Governance Agreement include:

Nomination Rights

Under the New Governance Agreement, the BC Shareholder has the right to nominate (i) two directors for election to our board of directors as long as the BC Shareholder owns at least 25% of our outstanding common shares; and (ii) one director for election to our board of directors as long as the BC Shareholder owns at least 5% but less than 25% of our outstanding common shares, in each case calculated on a fully diluted basis, after giving effect to convertible, exchangeable or exercisable rights or securities held by the BC Shareholder (other than our 4.50% convertible senior notes due 2025 issued on June 18, 2018).

In the event that the BC Shareholder's nomination rights are decreased as described above, the BC Shareholder will agree to cause its respective director or directors to resign from our board of directors as appropriate to reflect the decrease, and, subject to the rights described above, the majority of the remaining directors on our board of directors appointed by the general meeting may fill such vacancy.

We have agreed to include the director nominees proposed by the BC Shareholder on each slate of nominees for election to our board of directors, to recommend the election of those nominees to our shareholders and to use reasonable best efforts to have them elected to our board of directors.

Table of Contents

Information Rights; Confidentiality

Under the New Governance Agreement, if the BC Shareholder is not entitled to nominate a director for election to our board of directors but remains a shareholder, it will be entitled to certain information rights, including the receipt of the board meeting materials provided to each director. The BC Shareholder is subject to customary confidentiality obligations.

Termination

The New Governance Agreement will terminate upon the earlier of (i) April 23, 2023 and (ii) the day on which the BC Shareholder first either (x) owns shares representing less than 5% of our outstanding common shares or (y) is no longer entitled to nominate a director.

New Shareholders Agreement

In December 2018, we entered into a new shareholders agreement (the "New Shareholders Agreement") with the BC Shareholder, certain shareholders affiliated with Silver Lake Group, L.L.C. (the "Silver Lake Shareholder") and David McGlade and certain of his affiliated trusts and entities (the "McGlade Shareholder" and, together with the BC Shareholder and the Silver Lake Shareholder, the "Shareholders"). Key terms of the New Shareholders Agreement include:

Tag-Along and Drag-Along Rights

Under the New Shareholders Agreement, each of the Silver Lake Shareholder and the McGlade Shareholder has certain tag-along rights on transfers by the BC Shareholder, and the BC Shareholder has drag-along rights with respect to the Silver Lake Shareholder and the McGlade Shareholder under certain circumstances.

The tag-along rights will terminate at such time as either the BC Shareholder or the Silver Lake Shareholder owns less than 5% of our outstanding common shares. The drag-along rights will terminate at such time as either (i) the BC Shareholder and the Silver Lake Shareholder together own in the aggregate less than 10% of our outstanding common shares or (ii) either the BC Shareholder or the Silver Lake Shareholder ceases to own any common shares.

Information Rights; Confidentiality

Under the New Shareholders Agreement, until such time as the Silver Lake Shareholder owns less than 5% of our outstanding common shares, the Silver Lake Shareholder will be entitled to receive certain information required to meet internal and external reporting or other legal/compliance obligations. The Silver Lake Shareholder is subject to customary confidentiality obligations.

Registration Rights

Under the New Shareholders Agreement, the BC Shareholder, the Silver Lake Shareholder and the McGlade Shareholder have certain registration rights. Subject to certain exceptions, the BC Shareholder is entitled to unlimited demand registrations, and the Silver Lake Shareholder is entitled to one demand registration within any 12-month period. Each Shareholder is entitled to piggyback registration rights with respect to any registrations by us, for our own account or for the account of other Shareholders, subject to certain exceptions. The registration rights are subject to customary limitations and exceptions, including our right to withdraw or defer the registration or a sale pursuant thereto in certain circumstances and certain cutbacks by the underwriters if marketing factors require a limitation on the number of shares to be underwritten in a proposed offering.

In connection with the registrations described above, we have agreed to indemnify the Shareholders against certain liabilities. In addition, we and the Shareholders have agreed that certain fees, costs and expenses of any registration will be paid pro rata by us and selling Shareholders based on the number of securities to be registered or sold, except that (a) the pro rata expenses attributable to the McGlade Shareholder and the costs of one counsel for the selling Shareholders will be borne by us and (b) underwriting discounts and commissions and similar brokers' fees, transfer taxes and costs of more than one counsel for the selling Shareholders will be borne by the Shareholders incurring the same.

The registration rights will terminate (i) as to the McGlade Shareholder, at such time as the McGlade Shareholder no longer owns any registrable securities and (ii) as to each of the BC Shareholder and the Silver Lake Shareholder, at

such time as such Shareholder owns less than 5% of our outstanding common shares.

Termination

Table of Contents

The New Shareholders Agreement will terminate at such time as the tag-along rights, drag-along rights and registration rights provisions have all terminated according to their terms.

Indemnification Agreements

We have entered into agreements with our executive officers and directors to provide contractual indemnification in addition to the indemnification provided for in our articles of incorporation.

Debt Agreements

For a summary of the terms of our material debt agreements, see Note 12 to our consolidated financial statements included elsewhere in this Annual Report. In addition, with regard to all the notes issued by Intelsat Luxembourg, ICF and Intelsat Jackson, the following covenants and events of default apply:

Covenants that limit the issuers, and in some cases some of the issuers' subsidiaries', ability to:

- incur additional debt or issue disqualified or preferred stock;
- pay dividends or repurchase shares of Intelsat Jackson or any of its parent companies;
- make certain investments;
- enter into transactions with affiliates;
- merge, consolidate and sell assets; and
- incur liens on any of their assets securing other indebtedness, unless the applicable notes are equally and ratably secured.

Events of Default

- default in payments of interest after a 30-day grace period or a default in the payment of principal when due;
- default in the performance of any covenant in the indenture that continues for more than 60 days after notice of default has been provided to the issuer;
- failure to make any payment when due, including applicable grace periods, under any indebtedness for money borrowed by Intelsat Luxembourg, ICF, Intelsat Jackson or a significant subsidiary thereof having a principal amount in excess of $75 million;
- the acceleration of the maturity of any indebtedness for money borrowed by Intelsat Luxembourg, ICF, Intelsat Jackson or a significant subsidiary thereof having a principal amount in excess of $75 million;
- insolvency or bankruptcy of Intelsat Luxembourg, ICF, Intelsat Jackson or a significant subsidiary thereof; and
- failure by Intelsat Luxembourg, ICF, Intelsat Jackson or a significant subsidiary thereof to pay final judgments aggregating in excess of $75 million, which are not discharged, waived or stayed for 60 days after the entry thereof.

If any event of default occurs and is continuing with respect to the notes, the trustee or the holders of at least 25% in principal amount of the notes may declare the entire principal amount of the notes to be immediately due and payable. If any event of default with respect to the notes occurs because of events of bankruptcy, insolvency or reorganization, the entire principal amount of the notes will be automatically accelerated, without any action by the trustee or any holder.

D. Exchange Controls

We are not aware of any governmental laws, decrees, regulations or other legislation in Luxembourg that restrict the export or import of capital, including the availability of cash and cash equivalents for use by our affiliated companies, or that affect the remittance of dividends, interest or other payments to non-resident holders of our securities.

E. Taxation

The following sets forth material Luxembourg income tax consequences of an investment in our common shares. It is based upon laws and relevant interpretations thereof in effect as of the date of this Annual Report, all of which are subject to change. This discussion does not deal with all possible tax consequences relating to an investment in our

common shares, such as the tax consequences under U.S. federal, state, local and other tax laws.

Table of Contents

Material Luxembourg Tax Considerations for Holders of Shares

The following is a summary discussion of certain Luxembourg tax considerations of the acquisition, ownership and disposition of your common shares that may be applicable to you if you acquire our common shares. This does not purport to be a comprehensive description of all of the tax considerations that may be relevant to any of our common shares or the Holders thereof, and does not purport to include tax considerations that arise from rules of general application or that are generally assumed to be known to Holders. This discussion is not a complete analysis or listing of all of the possible tax consequences of such transactions and does not address all tax considerations that might be relevant to particular Holders in light of their personal circumstances or to persons that are subject to special tax rules.

It is not intended to be, nor should it be construed to be, legal or tax advice. This discussion is based on Luxembourg laws and regulations as they stand on the date of this Annual Report and is subject to any change in law or regulations or changes in interpretation or application thereof (and which may possibly have a retroactive effect). Prospective investors should therefore consult their own professional advisers as to the effects of state, local or foreign laws and regulations, including Luxembourg tax law and regulations, to which they may be subject.

As used herein, a “Luxembourg individual” means an individual resident in Luxembourg who is subject to personal income tax (impôt sur le revenu) on his or her worldwide income from Luxembourg or foreign sources, and a “Luxembourg corporate Holder” means a company (that is, a fully taxable entity within the meaning of Article 159 of the Luxembourg Income Tax Law) resident in Luxembourg subject to corporate income tax (impôt sur le revenu des collectivités) and municipal business tax (impôt commercial communal) on its worldwide income from Luxembourg or foreign sources. For purposes of this summary, Luxembourg individuals and Luxembourg corporate Holders are collectively referred to as “Luxembourg Holders.” A “non-Luxembourg Holder” means any investor in our common shares other than a Luxembourg Holder.

Tax Regime Applicable to Realized Capital Gains

Luxembourg Holders

Luxembourg resident individual Holders

Capital gains realized by Luxembourg resident individuals who do not hold their shares as part of a commercial or industrial or independent business and who hold no more than 10% of the share capital of the Company will only be taxable if they are realized on a disposal of common shares that takes place before their acquisition or within the first six months following their acquisition. If such is the case, capital gains will be taxed at ordinary rates according to the progressive income tax schedule plus surcharges.

For Luxembourg resident individuals holding (alone or together with his/her spouse or civil partner and underage children), directly or indirectly, more than 10% of the capital of the Company at any time during the five years prior to the disposal (or if the Luxembourg resident individuals have received the shares for no consideration within the last five years prior to the disposal and that the former holder held at least 10% in the capital of the Company at any moment during said five years), capital gains will be taxable, regardless of the holding period. In case of a disposal after six months from acquisition, the capital gain is subject to tax as extraordinary income subject to the half-global rate method. Within the six month period, capital gains will be taxed at ordinary rates according to the progressive income tax schedule plus surcharges.

If such shares are held as part of a commercial or industrial business, capital gains would be taxable in the same manner as income from such business.

Luxembourg resident corporate Holders

Capital gains realized upon the disposal of common shares by a fully taxable Luxembourg resident corporate Holder will in principle be subject to corporate income tax and municipal business tax. The combined applicable rate (including an unemployment fund contribution) is 26.01% for the fiscal years as from January 1, 2018 for a Luxembourg resident corporate Holder established in Luxembourg-City. An exemption from such taxes may be available to the Luxembourg resident corporate Holder pursuant to Article 166 of the Luxembourg Income Tax Law subject to the fulfillment of the conditions set forth therein. The scope of the capital gains exemption can be limited in

the cases provided by the Grand Ducal Decree of December 21, 2001, as amended.

Non-Luxembourg Holders

Table of Contents

An individual who is a non-Luxembourg Holder of shares (and who does not have a permanent establishment, a permanent representative or a fixed place of business in Luxembourg) will only be subject to Luxembourg taxation on capital gains arising upon disposal of such shares if such non-Luxembourg Holder has (alone or together with his or her spouse or civil partner and underage children), directly or indirectly held, more than 10% of the capital of the Company at any time during the past five years, and either (i) such non-Luxembourg Holder has been a resident of Luxembourg for tax purposes for at least 15 years and has become a non-resident within the last five years preceding the realization of the gain, subject to any applicable tax treaty, or (ii) the disposal of shares occurs within six months from their acquisition (or prior to their actual acquisition), subject to any applicable tax treaty.
A corporate non-Luxembourg Holder which has a permanent establishment, a permanent representative or a fixed place of business in Luxembourg to which shares are attributable, will bear corporate income tax and municipal business tax on a gain realized on a disposal of such shares as set forth above for a Luxembourg corporate Holder. However, gains realized on the disposal of the shares may benefit from the full exemption provided for by Article 166 of the Luxembourg Income Tax Law and by the Grand Ducal Decree of December 21, 2001, as amended, subject in each case to fulfillment of the conditions set out therein.

A corporate non-Luxembourg Holder, which has no permanent establishment in Luxembourg to which the shares are attributable, will bear corporate income tax and municipal business tax on a gain realized on a disposal of such shares under the same conditions applicable to an individual non-Luxembourg Holder, as set out above under (ii).
Tax Regime Applicable to Distributions
Withholding tax
Distributions imputed for tax purposes on current or accumulated profits are subject to a withholding tax of 15%. Distributions sourced from a reduction of capital as defined in Article 97 (3) of the Luxembourg Income Tax Law, including, among others, share premium, should not be subject to withholding tax, provided no newly accumulated fiscal profits are recognized. For the foreseeable future, we do not expect to recognize newly accumulated fiscal profits in the relevant annual standalone accounts of the Company prepared under Luxembourg GAAP, and so, on that basis, distributions should not be subject to Luxembourg withholding tax.
To the extent, however, that the Company would recognize, against our expectation, newly accumulated fiscal profits in its annual standalone accounts prepared under Luxembourg GAAP, there will be a 15% withholding tax, unless one of the below exemptions or reductions is available for the dividend recipient.
The rate of the withholding tax may be reduced pursuant to any applicable double taxation treaty existing between Luxembourg and the country of residence of the relevant Holder, subject to the fulfillment of the conditions set forth therein.
No withholding tax applies if the distribution is made to (i) a Luxembourg resident corporate Holder (that is, a fully taxable entity within the meaning of Article 159 of the Luxembourg Income Tax Law), (ii) an undertaking of collective character which is resident of a Member State of the European Union and is referred to by article 2 of the Council Directive 2011/96/EU of 30 November 2011 and concerning the system of taxation applicable in the case of parent companies and subsidiaries of different member states (subject to the general anti-abuse rule provided for by Council Directive 2015/121/EU as implemented into Luxembourg laws), (iii) a corporation or a cooperative company resident in Norway, Iceland or Liechtenstein and subject to a tax comparable to corporate income tax as provided by the Luxembourg Income Tax Law, (iv) an undertaking with a collective character subject to a tax comparable to corporate income tax as provided by the Luxembourg Income Tax Law which is resident in a country that has concluded a tax treaty with Luxembourg, (v) a share capital company resident in Switzerland which is subject to corporate income tax in Switzerland without benefiting from an exemption and (vi) a Luxembourg permanent establishment of one of the aforementioned categories under (i) to (iv), provided that at the date of payment, the Holder holds or commits to hold directly or through a tax transparent vehicle, during an uninterrupted period of at least twelve months, shares representing at least 10% of the share capital of the Company or acquired for an acquisition price of at least EUR 1.2 million.

Income Tax

Luxembourg individual Holders

Luxembourg individual Holders must include the distributions paid on the shares in their taxable income. However, 50% of the amount of such dividends may be exempted from tax under the Luxembourg Income Tax Law. The applicable withholding tax can, under certain conditions, entitle the relevant Luxembourg Holder to a tax credit.

Table of Contents

Luxembourg resident corporate Holders
Luxembourg resident corporate Holders can benefit from an exemption of 100% of the amount of a dividend received provided that, at the date when the income is made available, they hold or commit to hold a participation of minimum 10% of the share capital of the Company or which has an acquisition price equivalent to minimum EUR 1.2 million for an uninterrupted period of at least 12 months.
Net Wealth Tax
Luxembourg Holders
Luxembourg net wealth tax will not be levied on a Luxembourg Holder with respect to the shares held unless (i) the Luxembourg Holder is a legal entity subject to net wealth tax in Luxembourg; or (ii) the shares are attributable to an enterprise (other than of an individual Holder) or part thereof which is carried on through a permanent establishment, a fixed place of business or a permanent representative in Luxembourg.

Net wealth tax is levied annually at a digressive rate depending on the amount of the net wealth of the above, as determined for net wealth tax purposes (i.e., 0.5% on amounts up to EUR 500 million and 0.05% on the amount of taxable net wealth exceeding EUR 500 million).
The shares of the Company may be exempt from net wealth tax subject to the conditions set forth by Paragraph 60 of the Law of October 16, 1934 on the valuation of assets (Bewertungsgesetz), as amended.
Non-Luxembourg Holders
Luxembourg net wealth tax will not be levied on a non-Luxembourg Holder with respect to the shares held unless the shares are attributable to an enterprise of a non-Luxembourg corporate Holder or part thereof which is carried on through a permanent establishment or a permanent representative in Luxembourg.
Stamp and Registration Taxes
No registration tax or stamp duty will be payable by a Holder of shares in Luxembourg solely upon the disposal of shares by sale or exchange.
Estate and Gift Taxes
No estate or inheritance tax is levied on the transfer of shares upon the death of a Holder of shares in cases where the deceased was not a resident of Luxembourg for inheritance tax purposes, and no gift tax is levied upon a gift of shares if the gift is not passed before a Luxembourg notary or recorded in a deed registered in Luxembourg. Where a Holder of shares is a resident of Luxembourg for tax purposes at the time of his or her death, the shares are included in his or her taxable estate for inheritance tax or estate tax purposes.

F. Dividends and Paying Agents
Not applicable.

G. Statements by Experts
Not applicable.

H. Documents on Display
Documents concerning us that are referred to herein may be inspected at our principal executive offices at 4, rue Albert Borschette, L-1246 Luxembourg. Those documents, which include our registration statements, periodic reports and other documents which were filed with or furnished to the SEC, may be obtained electronically from the Investors section of our

Table of Contents

website at www.intelsat.com, from the SEC's website at www.sec.gov or from the SEC public reference room at 100 F Street, N.E., Room 1580, Washington, D.C. 20549. Further information on the operation of the public reference rooms may be obtained by calling the SEC at 1-202-551-8909. Copies of documents can also be requested from the SEC public reference rooms for a copying fee at prescribed rates.

I. Subsidiary Information
Not applicable.

Item 11. Quantitative and Qualitative Disclosures About Market Risk
We are primarily exposed to the market risk associated with unfavorable movements in interest rates and foreign currencies. The risk inherent in our market risk sensitive instruments and positions is the potential loss arising from adverse changes in those factors. We do not purchase or hold any derivative financial instruments for speculative purposes.

Interest Rate Risk
The satellite communications industry is a capital intensive, technology driven business. We are subject to interest rate risk primarily associated with our borrowings. Interest rate risk is the risk that changes in interest rates could adversely affect earnings and cash flows. Specific risks include the risk of increasing interest rates on short-term debt, for planned new fixed-rate long-term financings, and for planned refinancings using long-term fixed-rate debt.

Excluding the impact of our outstanding interest rate cap contracts, approximately 79% of our debt, or $11.4 billion principal amount was fixed-rate debt as of December 31, 2017. As of December 31, 2018, our fixed-rate debt increased to approximately 83%, or $11.9 billion. We also perform interest rate sensitivity analyses on our variable-rate debt. While our variable-rate debt may impact earnings and cash flows as interest rates change, it is not subject to changes in fair values. Based on the level of fixed-rate debt outstanding at December 31, 2018, a 100 basis point decrease in market rates would result in an increase in fair value of this fixed-rate debt of approximately $446.0 million. These analyses indicate that a 100 basis point increase in interest rates would have an annual impact of approximately $24.0 million on our consolidated statements of operations and cash flows as of December 31, 2018.
As of December 31, 2018, we held interest rate cap contracts with an aggregate notional amount of $2.4 billion, which mature in February 2021. These contracts were entered into to mitigate our risk of interest rate increases on the floating rate term loans under our senior secured credit facilities. If LIBOR exceeds 1.89% prior to the 3 year expiration date of the cap contracts, the Company will receive the resulting increase in interest payment required to the term loan holders from the counterparties to the arrangement.
These interest rate cap contracts have not been designated for hedge accounting treatment in accordance with the Derivatives and Hedging topic of the FASB ASC 815, as amended and interpreted, and the changes in fair value of these instruments are recognized in earnings during the period of change.
Foreign Currency Risk
We do not currently use material foreign currency derivatives to hedge our foreign currency exposures. 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 Brazilian reais as compared to U.S. dollars 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 partially 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.

Table of Contents

Item 12. Description of Securities Other than Equity Securities
Not applicable.

PART II

Item 13. Defaults, Dividend Arrearages and Delinquencies
Not applicable.

Item 14. Material Modifications to the Rights of Security Holders and Use of Proceeds
Not applicable.

Item 15. Controls and Procedures
(a) Disclosure Controls and Procedures
Disclosure controls and procedures are controls and procedures that are designed to ensure that information required to be disclosed by us in reports that we file or furnish under the Securities Exchange Act of 1934, as amended (the "Exchange Act"), is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms. We periodically review the design and effectiveness of our disclosure controls and procedures worldwide, including compliance with various laws and regulations that apply to our operations. We make modifications to improve the design and effectiveness of our disclosure controls and procedures, and may take other corrective action, if our reviews identify a need for such modifications or actions. In designing and evaluating the disclosure controls and procedures, we recognize that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives.
We have carried out an evaluation, under the supervision and with the participation of our management, including our principal executive officer and our principal financial officer, of the effectiveness of the design and operation of our disclosure controls and procedures (as defined in Rule 13a-15(e) and 15d-15(e) under the Exchange Act), as of the year ended December 31, 2018. Based upon that evaluation, our principal executive officer and our principal financial officer concluded that our disclosure controls and procedures were effective as of December 31, 2018.
(b) Management's Annual Report on Internal Control over Financial Reporting
Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Exchange Act Rule 13a-15(f). Under the supervision and with the participation of our management, including our principal executive officer and principal financial officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting based on the framework set forth in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework). Based on our evaluation, management has concluded that our internal control over financial reporting was effective as of December 31, 2018.
(c) Attestation Report of the Registered Public Accounting Firm
See the report of KPMG LLP, an independent registered public accounting firm, included under "Item 18. Financial Statements" on pages F-2 and F-3 of this Annual Report.
(d) Changes in Internal Control over Financial Reporting
There were no changes in our internal control over financial reporting during the year ended December 31, 2018 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 16. [Reserved]

Table of Contents

Item 16A. Audit Committee Financial Expert

The board of directors has determined that each of Messrs. Kangas and Diercksen qualifies as an audit committee financial expert, as defined in Item 16A of Form 20-F, and that Messrs. Kangas and Diercksen are also "independent," as defined in Rule 10A-3 under the Exchange Act and applicable NYSE standards. For more information about Messrs. Kangas and Diercksen, see Item 6A—Directors, Senior Management and Employees—Directors and Senior Management.

Item 16B. Code of Ethics

We have adopted a Code of Ethics for Senior Financial Officers, including our chief executive officer, chief financial officer, principal accounting officer, controller and any other person performing similar functions. The Code of Ethics is posted on our website at www.intelsat.com. We intend to disclose on our website any amendments to or waivers of this Code of Ethics.

Item 16C. Principal Accountant Fees and Services

Audit Fees

Our audit fees were $3.6 million and $4.9 million for the years ended 2017 and 2018, respectively.

Audit-Related Fees

Our audit-related fees were none for the years ended 2017 and 2018, respectively.

Tax Fees

Our tax fees paid to our principal accountants were none and $11,000 for the years ended 2017 and 2018, respectively. The fees were primarily associated with U.S. state taxation.

All Other Fees

All other fees paid to our principal accountants were $150,000 for each of the two years ended 2017 and 2018. Our other fees for 2017 and 2018 included fees associated with attestation of IT security controls.

Audit Committee Pre-Approval Policies and Procedures

Consistent with SEC requirements regarding auditor independence, the audit committee has adopted a policy to pre-approve services to be provided by our independent registered public accounting firm prior to commencement of the specified service. The requests for pre-approval are submitted to the audit committee, or a designated member of the audit committee, by our Chief Financial Officer or Controller, and the audit committee chairman executes engagement letters with our independent registered public accounting firm following approval by audit committee members, or the designated member of the audit committee. All services performed by KPMG LLP during 2018 were pre-approved by the audit committee.

Item 16D. Exemptions from the Listing Standards for Audit Committees

Not applicable.

Item 16E. Purchases of Equity Securities by the Issuer and Affiliated Purchasers

Not applicable.

Item 16F. Change in Registrants' Certifying Accountant

Not applicable.

Table of Contents

Items 16G. Corporate Governance

Our common shares are listed on the NYSE. For purposes of NYSE rules, so long as we are a foreign private issuer, we are eligible to take advantage of certain exemptions from NYSE corporate governance requirements provided in the NYSE rules. We are required to disclose the significant ways in which our corporate governance practices differ from those that apply to U.S. companies under NYSE listing standards. Set forth below is a summary of these differences:

Director Independence—The NYSE rules require domestic companies to have a majority of independent directors, but as a foreign private issuer we are exempt from this requirement. Our board of directors consists of seven members and we believe that three of our board members satisfy the “independence” requirements of the NYSE rules.

Board Committees—The NYSE rules require domestic companies to have a compensation committee and a nominating and corporate governance committee composed entirely of independent directors, but as a foreign private issuer we are exempt from these requirements. We have a compensation committee comprised of three members, and we believe that two of the committee members satisfy the “independence” requirements of the NYSE rules. We have a nominating and corporate governance committee comprised of four members, and we believe that two of the committee members satisfy the “independence” requirements of the NYSE rules.

Item 16H. Mine Safety Disclosure

Not applicable.

PART III

Item 17. Financial Statements

Not applicable.

Item 18. Financial Statements

(a)(1) The following financial statements are included in this Annual Report on Form 20-F:

	Page
Report of Independent Registered Public Accounting Firm	F-2
Consolidated Balance Sheets as of December 31, 2017 and 2018	F-4
Consolidated Statements of Operations for the Years Ended December 31, 2016, 2017 and 2018	F-5
Consolidated Statements of Comprehensive Income (Loss) for the Years Ended December 31, 2016, 2017 and 2018	F-6
Consolidated Statements of Changes in Shareholders’ Deficit for the Years Ended December 31, 2016, 2017 and 2018	F-7
Consolidated Statements of Cash Flows for the Years Ended December 31, 2016, 2017 and 2018	F-8
Notes to Consolidated Financial Statements	F-10

(a)(2) The following Financial Statement schedule is included in this Annual Report on Form 20-F:

Schedule II—Valuation and Qualifying Accounts for the Years Ended December 31, 2016, 2017 and 2018	F-53

Item 19. Exhibits

The following exhibits are filed as part of this Annual Report:

Table of Contents

EXHIBIT INDEX

Exhibit No.	Document Description
1.1	Consolidated Articles of Incorporation of Intelsat S.A., as amended on June 19, 2018.*
2.1	Indenture for Intelsat (Luxembourg) S.A.'s 6 3/4% Senior Notes due 2018, 7 3/4% Senior Notes due 2021 and 8 1/8% Senior Notes due 2023, dated as of April 5, 2013, by and among Intelsat (Luxembourg) S.A., as Issuer, Intelsat S.A., as Parent Guarantor, and Wells Fargo Bank, National Association, as Trustee (incorporated by reference to Exhibit 4.1 of Intelsat Investments S.A.'s Current Report on Form 8-K, File No. 000-50262, filed on April 5, 2013).
2.2	First Supplemental Indenture for Intelsat (Luxembourg) S.A.'s 6 3/4% Senior Notes due 2018, 7 3/4% Senior Notes due 2021 and 8 1/8% Senior Notes due 2023, dated as of May 20, 2013, by and among Intelsat S.A., Intelsat Investment Holdings S.à r.l., Intelsat Holdings S.A., each as a Guarantor, Intelsat Jackson Holdings S.A., as Issuer, and Wells Fargo Bank, National Association, as Trustee (incorporated by reference to Exhibit 2.32 of Intelsat S.A.'s Annual Report on Form 20-F, File No. 001-35878, filed on February 20, 2014).
2.3	Indenture for Intelsat Jackson Holdings S.A.'s 5 1/2% Senior Notes due 2023, dated as of June 5, 2013, by and among Intelsat Jackson Holdings S.A., as Issuer, Intelsat S.A., Intelsat Investment Holdings S.à r.l., Intelsat Holdings, S.A., Intelsat Investments S.A., Intelsat (Luxembourg) S.A., each as a Parent Guarantor, the subsidiary guarantors named therein and Wells Fargo Bank, National Association, as Trustee (incorporated by reference to Exhibit 99.1 of Intelsat S.A.'s Current Report on Form 6-K, File No. 001-35878, filed on June 5, 2013).
2.4	First Supplemental Indenture for Intelsat Jackson Holdings S.A.'s 5 1/2% Senior Notes due 2023, dated as of June 28, 2013, by and among Intelsat Finance Bermuda Ltd., as guarantor, Intelsat Jackson Holdings S.A., as Issuer, and Wells Fargo Bank, National Association, as Trustee (incorporated by reference to Exhibit 2.35 of Intelsat S.A.'s Annual Report on Form 20-F, File No. 001-35878, filed on February 20, 2014).
2.5	Second Supplemental Indenture for Intelsat Jackson Holdings S.A.'s 5 1/2% Senior Notes due 2023, dated as of November 25, 2015, by and among Intelsat Ireland Operations Limited, as guarantor, Intelsat Jackson Holdings S.A., as Issuer, and Wells Fargo Bank, National Association, as Trustee (incorporated by reference to Exhibit 2.25 of Intelsat S.A.'s Annual Report on Form 20-F, File No. 001-35878, filed on March 8, 2016).
2.6	Third Supplemental Indenture for Intelsat Jackson Holdings S.A.'s 5 1/2% Senior Notes due 2023, dated as of December 22, 2016, by and among Intelsat Connect Finance S.A., as New Guarantor, Intelsat Jackson Holdings S.A., as Issuer, and U.S. Bank National Association, as Trustee (incorporated by reference to Exhibit 2.25 of Intelsat S.A.'s Annual Report on Form 20-F, File No. 000-35878, filed on February 28, 2017, as amended).
2.7	Indenture for Intelsat Jackson Holdings S.A.'s 8% Senior Secured Notes due 2024, dated as of March 29, 2016, by and among Intelsat Jackson Holdings S.A., as Issuer, Intelsat (Luxembourg) S.A. as Parent Guarantor, the subsidiary guarantors named therein and Wilmington Trust, National Association, as Trustee (including the form of the 8% Notes) (incorporated by reference to Exhibit 99.1 of Intelsat S.A.'s Current Report on Form 6-K, File No. 001-35878, filed on March 29, 2016).

2.8	First Supplemental Indenture for Intelsat Jackson Holdings S.A.'s 8% Senior Secured Notes due 2024, dated as of December 22, 2016, by and among Intelsat (Luxembourg) S.A., as Released Guarantor, Intelsat Connect Finance S.A., as New Guarantor, Intelsat Jackson Holdings S.A., as Issuer, and Wilmington Trust, National Association, as Trustee (incorporated by reference to Exhibit 2.27 of Intelsat S.A.'s Annual Report on Form 20-F, File No. 000-35878, filed on February 28, 2017, as amended).
2.9	Indenture for Intelsat Jackson Holdings S.A.'s 9 1/2% Senior Secured Notes due 2022, dated as of June 30, 2016, by and among Intelsat Jackson Holdings S.A., as Issuer, Intelsat (Luxembourg) S.A. as Parent Guarantor, the subsidiary guarantors named therein and Wilmington Trust, National Association, as Trustee (including the form of the 91/2% Notes) (incorporated by reference to Exhibit 99.1 of Intelsat S.A.'s Current Report on Form 6-K, File No. 001-35878, filed on July 1, 2016).
2.10	First Supplemental Indenture for Intelsat Jackson Holdings S.A.'s 9 1/2% Senior Secured Notes due 2022, dated as of December 22, 2016, by and among Intelsat (Luxembourg) S.A., as Released Guarantor, Intelsat Connect Finance S.A., as New Guarantor, Intelsat Jackson Holdings S.A., as Issuer, and Wilmington Trust, National Association, as Trustee (incorporated by reference to Exhibit 2.29 of Intelsat S.A.'s Annual Report on Form 20-F, File No. 000-35878, filed on February 28, 2017, as amended).
2.11	Indenture for Intelsat Jackson Holdings S.A.'s 9 3/4% Senior Notes due 2025, dated as of July 5, 2017, by and among Intelsat Jackson Holdings S.A., as Issuer, Intelsat S.A., Intelsat Investment Holdings S.à r.l., Intelsat Holdings S.A., Intelsat Investments S.A., Intelsat (Luxembourg) S.A. and Intelsat Connect Finance S.A., each as a Parent Guarantor, the subsidiary guarantors named therein and U.S. Bank, National Association, as Trustee (incorporated by reference to Exhibit 99.1 of Intelsat S.A.'s Current Report on Form 6-K, File No. 001-35878, filed on July 5, 2017).
2.12	Indenture for Intelsat Connect Finance S.A.'s 9 1/2% Senior Notes due 2023, dated as of August 16, 2018, by and among Intelsat Connect Finance S.A., as Issuer, Intelsat Envision Holdings LLC, Intelsat (Luxembourg) S.A., as Parent Guarantor and U.S. Bank, National Association, as Trustee (including the form of the 9 1/2% Notes) (incorporated by reference to Exhibit 99.1 of Intelsat S.A.'s Current Report on Form 6-K, File No. 001-35878, filed on August 16, 2018).
2.13	Indenture for Intelsat (Luxembourg) S.A.'s 12 1/2% Senior Notes due 2024, dated as of January 6, 2017, by and between Intelsat (Luxembourg) S.A., as Issuer and U.S. Bank, National Association, as Trustee (including the form of the 12 1/2% Notes) (incorporated by reference to Exhibit 99.1 of Intelsat S.A.'s Current Report on Form 6-K, File No. 001-35878, filed on January 6, 2017).
2.14	Indenture for Intelsat S.A.'s 4½% Convertible Senior Notes due 2025, dated as of June 18, 2018, by and between Intelsat S.A., as Issuer, Intelsat Envision Holdings LLC, as Guarantor and U.S. Bank National Association, as Trustee (incorporated by reference to Exhibit 99.1 of Intelsat S.A.'s Current Report on Form 6-K, File No. 001-35878, filed on June 18, 2018).
2.15	Indenture for Intelsat Jackson Holdings S.A.'s 8½% Senior Notes due 2024, dated as of September 19, 2018, by and between Intelsat Jackson Holdings S.A., as Issuer, Intelsat S.A., Intelsat Investment Holdings S.à r.l., Intelsat Holdings S.A., Intelsat Investments S.A., Intelsat (Luxembourg) S.A. and Intelsat Connect Finance S.A., each as a Parent Guarantor, the subsidiary guarantors named therein and U.S. Bank National Association, as Trustee (incorporated by reference to Exhibit 99.1 to Intelsat S.A.'s Current Report on Form 6-K, File No. 001-35878, filed September 19, 2018).

Table of Contents

Exhibit No.	Document Description
2.16	First Supplemental Indenture for Intelsat Jackson Holdings S.A.'s 9¾% Senior Notes due 2025, dated as of June 29, 2018, by and among Intelsat Jackson Holdings S.A., as Issuer, Intelsat Genesis Inc., as New Guarantor, and U.S. Bank National Association, as Trustee.*
2.17	Second Supplemental Indenture for Intelsat Jackson Holdings S.A.'s 9¾% Senior Notes due 2025, dated as of July 2, 2018, by and among Intelsat Jackson Holdings S.A., as Issuer, Intelsat Alliance LP and Intelsat Genesis GP LLC, collectively as New Guarantors, and U.S. Bank National Association, as Trustee.*
2.18	Second Supplemental Indenture for Intelsat Jackson Holdings S.A.'s 9½% Senior Secured Notes due 2022, dated as of June 29, 2018, by and among Intelsat Jackson Holdings S.A., as Issuer, Intelsat Genesis Inc., as New Guarantor, and U.S. Bank National Association, as Trustee.*
2.19	Third Supplemental Indenture for Intelsat Jackson Holdings S.A.'s 9½% Senior Secured Notes due 2022, dated as of July 2, 2018, by and among Intelsat Jackson Holdings S.A., as Issuer, Intelsat Alliance LP, Intelsat Genesis GP LLC and Intelsat Ventures S.à r.l., collectively as New Guarantors, and U.S. Bank National Association, as Trustee.*
2.20	Second Supplemental Indenture for Intelsat Jackson Holdings S.A.'s 8% Senior Secured Notes due 2024, dated as of June 29, 2018, by and among Intelsat Jackson Holdings S.A., as Issuer, Intelsat Genesis Inc., as New Guarantor, and Wilmington Trust, National Association, as Trustee.*
2.21	Third Supplemental Indenture for Intelsat Jackson Holdings S.A.'s 8% Senior Secured Notes due 2024, dated as of July 2, 2018, by and among Intelsat Jackson Holdings S.A., as Issuer, Intelsat Alliance LP, Intelsat Genesis GP LLC and Intelsat Ventures S.à r.l., collectively as New Guarantors, and Wilmington Trust, National Association, as Trustee.*
2.22	Fourth Supplemental Indenture for Intelsat Jackson Holdings S.A.'s 5½% Senior Notes due 2023, dated as of June 29, 2018, by and among Intelsat Jackson Holdings S.A., as Issuer, Intelsat Genesis Inc., as New Guarantor, and U.S. Bank National Association, as Trustee.*
2.23	Fifth Supplemental Indenture for Intelsat Jackson Holdings S.A.'s 5½% Senior Notes due 2023, dated as of July 2, 2018, by and among Intelsat Jackson Holdings S.A., as Issuer, Intelsat Alliance LP, Intelsat Genesis GP LLC and Intelsat Ventures S.à r.l., collectively as New Guarantors, and U.S. Bank National Association, as Trustee.*
2.24	Eighth Supplemental Indenture for Intelsat Jackson Holdings S.A.'s 7½% Senior Notes due 2021, dated as of June 29, 2018, by and among Intelsat Jackson Holdings S.A., as Issuer, Intelsat Genesis Inc., as New Guarantor, and U.S. Bank National Association, as Trustee.*
2.25	Ninth Supplemental Indenture for Intelsat Jackson Holdings S.A.'s 7½% Senior Notes due 2021, dated as of July 2, 2018, by and among Intelsat Jackson Holdings S.A., as Issuer, Intelsat Alliance LP, Intelsat Genesis GP LLC and Intelsat Ventures S.à r.l., collectively as New Guarantors, and U.S. Bank National Association, as Trustee.*

2.26	Eleventh Supplemental Indenture for Intelsat Jackson Holdings S.A.'s 7¼% Senior Notes due 2020, dated as of June 29, 2018, by and among Intelsat Jackson Holdings S.A., as Issuer, Intelsat Genesis Inc., as New Guarantor, and U.S. Bank National Association, as Trustee.*
2.27	Twelfth Supplemental Indenture for Intelsat Jackson Holdings S.A.'s 7¼% Senior Notes due 2020, dated as of July 2, 2018, by and among Intelsat Jackson Holdings S.A., as Issuer, Intelsat Alliance LP, Intelsat Genesis GP LLC and Intelsat Ventures S.à r.l., collectively as New Guarantors, and U.S. Bank National Association, as Trustee.*
3.1	Governance Agreement, dated as of December 18, 2018, by and among Intelsat S.A. and the shareholders of Intelsat S.A. party thereto.*
4.1	Credit Agreement, dated as of January 12, 2011, by and among Intelsat Jackson, as the Borrower, Intelsat (Luxembourg) S.A., the several lenders from time to time parties thereto, Bank of America, N.A., as Administrative Agent, Credit Suisse Securities (USA) LLC ("Credit Suisse") and J.P. Morgan Securities LLC ("J.P. Morgan"), as Co-Syndication Agents, Barclays Bank Plc and Morgan Stanley Senior Funding, Inc., as Co-Documentation Agents, Merrill Lynch, Pierce, Fenner & Smith Incorporated ("Merrill Lynch"), Credit Suisse and J.P. Morgan, as Joint Lead Arrangers, Merrill Lynch, Credit Suisse, J.P. Morgan, Barclays Capital, Deutsche Bank Securities Inc., Morgan Stanley & Co. Incorporated and UBS Securities LLC, as Joint Bookrunners, and HSBC Bank USA, N.A., Goldman Sachs Partners LLC and RBC Capital Markets, as Co-Managers (incorporated by reference to Exhibit 10.1 of Intelsat Investments S.A.'s Current Report on Form 8-K, File No. 000-50262, filed on January 19, 2011).
4.2	Guarantee, dated as of January 12, 2011, made among each of the subsidiaries of Intelsat Jackson Holdings S.A. listed on Annex A thereto and Bank of America, N.A., as Administrative Agent (incorporated by reference to Exhibit 10.2 of Intelsat Investments S.A.'s Current Report on Form 8-K, File No. 000-50262, filed on January 19, 2011).
4.3	Luxembourg Shares and Beneficiary Certificates Pledge Agreement, dated as of January 12, 2011, by and among Intelsat (Luxembourg) S.A., Intelsat Jackson Holdings S.A., Intelsat Intermediate Holding Company S.A., Intelsat Phoenix Holdings S.A., Intelsat Subsidiary Holding Company S.A., Intelsat (Gibraltar) Limited, as Pledgors, and Wilmington Trust FSB, as Pledgee (incorporated by reference to Exhibit 10.3 of Intelsat Investments S.A.'s Current Report on Form 8-K, File No. 000-50262, filed on January 19, 2011).
4.4	Security and Pledge Agreement, dated as of January 12, 2011, by and among Intelsat Jackson Holdings S.A., each of the subsidiaries of Intelsat Jackson Holdings S.A. listed on Annex A thereto, Bank of America, N.A., as Administrative Agent, and Wilmington Trust FSB, as Collateral Trustee (incorporated by reference to Exhibit 10.4 of Intelsat Investments S.A.'s Current Report on Form 8-K, File No. 000-50262, filed on January 19, 2011).
4.5	Collateral Agency and Intercreditor Agreement, dated as of January 12, 2011 by and among Intelsat (Luxembourg) S.A., Intelsat Jackson Holdings S.A., the other grantors from time to time party thereto, Bank of America, N.A., as Administrative Agent under the Existing Credit Agreement, each additional First Lien Representative from time to time a party thereto, each Second Lien Representative from time to time a party thereto and Wilmington Trust FSB, as Collateral Trustee (incorporated by reference to Exhibit 10.5 of Intelsat Investments S.A.'s Current Report on Form 8-K, File No. 000-50262, filed on January 19, 2011).

Table of Contents

Exhibit No.	Document Description
4.6	Amendment and Joinder Agreement, dated as of October 3, 2012, by and among Intelsat (Luxembourg) S.A., Intelsat Jackson Holdings S.A., the Subsidiary Guarantors party thereto, Bank of America, N.A., as Administrative Agent for the Lenders and collateral agent for the Secured Parties, the Lenders party thereto and the Tranche B-1 Term Loan Lenders party thereto, to the Credit Agreement, dated as of January 12, 2011 (incorporated by reference to Exhibit 10.1 of Intelsat Investments S.A.'s Current Report on Form 8-K, File No. 000-50262, filed on October 3, 2012).
4.7	Amendment No. 2 and Joinder Agreement, dated as of November 27, 2013, by and among Intelsat (Luxembourg) S.A., Intelsat Jackson Holdings S.A., the Subsidiary Guarantors party hereto, Bank of America, N.A., as Administrative Agent for the lenders and collateral agent for the secured parties thereto, the lenders party thereto and the Tranche B-2 Term Loan Lenders (as defined therein) party thereto, to the Credit Agreement, dated as of January 12, 2011 (as amended by the Amendment and Joinder Agreement, dated as of October 3, 2012) (incorporated by reference to Exhibit 4.7 of Intelsat S.A.'s Annual Report on Form 20-F, File No. 001-35878, filed on February 20, 2014).
4.8	Amendment No. 3 and Joinder Agreement, dated as of November 27, 2017, by and among Intelsat Connect Finance S.A., Intelsat Jackson Holdings S.A., the Subsidiary Guarantors party hereto, Bank of America, N.A., as Administrative Agent for the lenders and collateral agent for the secured parties thereto, the lenders party thereto and the Tranche B-3 Term Loan Lenders (as defined therein) party thereto, to the Credit Agreement, dated as of January 12, 2011 (as amended by the Amendment and Joinder Agreement, dated as of October 3, 2012, and the Amendment No. 2 and Joinder Agreement, dated as of November 27, 2013) (incorporated by reference to Exhibit 99.1 of Intelsat S.A.'s Current Report on Form 6-K, File No. 001-35878, filed on November 27, 2017).
4.9	Amendment No. 4 and Joinder Agreement, dated as of December 12, 2017, by and among Intelsat Connect Finance S.A., Intelsat Jackson Holdings S.A., the Subsidiary Guarantors party hereto, Bank of America, N.A., as Administrative Agent for the lenders and collateral agent for the secured parties thereto, the lenders party thereto and the Tranche B-3 Term Loan Lenders (as defined therein) party thereto, to the Credit Agreement, dated as of January 12, 2011 (as amended by the Amendment and Joinder Agreement, dated as of October 3, 2012, the Amendment No. 2 and Joinder Agreement, dated as of November 27, 2013, and the Amendment No. 3 and Joinder Agreement, dated as of November 27, 2017) (incorporated by reference to Exhibit 99.1 of Intelsat S.A.'s Current Report on Form 6-K, File No. 001-35878, filed on December 12, 2017).
4.10	Amendment No. 5 and Joinder Agreement, dated as of January 2, 2018, by and among Intelsat Connect Finance S.A., Intelsat Jackson Holdings S.A., the Subsidiary Guarantors party hereto, Bank of America, N.A., as Administrative Agent for the lenders and collateral agent for the secured parties thereto, the lenders party thereto and the Tranche B-4 Term Loan Lenders and the Tranche B-5 Term Loan Lenders (as defined therein) party thereto, to the Credit Agreement, dated as of January 12, 2011 (as amended by the Amendment and Joinder Agreement, dated as of October 3, 2012, the Amendment No. 2 and Joinder Agreement, dated as of November 27, 2013, the Amendment No. 3 and Joinder Agreement, dated as of November 27, 2017, and the Amendment No. 4 and Joinder Agreement, dated as of December 12, 2017) (incorporated by reference to Exhibit 99.1 of Intelsat S.A.'s Current Report on Form 6-K, File No. 001-35878, filed on January 2, 2018).
4.11	

	Amendment No. 6 and Joinder Agreement, dated as of November 8, 2018, by and among Intelsat Connect Finance S.A., Intelsat Jackson Holdings S.A., the Subsidiary Guarantors party hereto, Bank of America, N.A., as Administrative Agent for the lenders and collateral agent for the secured parties thereto, the lenders party thereto, to the Credit Agreement, dated as of January 12, 2011 (as amended by the Amendment and Joinder Agreement, dated as of October 3, 2012, the Amendment No. 2 and Joinder Agreement, dated as of November 27, 2013, the Amendment No. 3 and Joinder Agreement, dated as of November 27, 2017, the Amendment No. 4 and Joinder Agreement, dated as of December 12, 2017, and the Amendment No. 5 and Joinder Agreement, dated January 2, 2018) (incorporated by reference to Exhibit 99.1 of Intelsat S.A.'s Current Report on Form 6-K, File No. 001-35878, November 8, 2018).
4.12	Severance Agreement, dated as of May 8, 2009, by and between Intelsat Global, Ltd. and Stephen Spengler (incorporated by reference to Exhibit 10.27 of Intelsat, Ltd.'s Current Report on Form 8-K, File No. 000-50262, filed on May 12, 2009).
4.13	Intelsat S.A.'s Amended and Restated 2008 Share Incentive Plan (incorporated by reference to Exhibit 4.15 of Intelsat S.A.'s Annual Report on Form 20-F, File No. 001-35878, filed on February 20, 2014).
4.14	Amendment, dated as of March 30, 2012, to the employment letter agreement, dated as of May 8, 2009, by and between Intelsat Global and Stephen Spengler (incorporated by reference to Exhibit 10.10 of Intelsat Investments S.A.'s Current Report on Form 8-K, File No. 000-50262, filed on April 5, 2012).
4.15	Shareholders Agreement, dated as of December 18, 2018, by and among Intelsat S.A. and the shareholders party thereto*.
4.16	Intelsat S.A.'s 2013 Equity Incentive Plan (incorporated by reference to Exhibit 4.39 of Intelsat S.A.'s Annual Report on Form 20-F, File No. 001-35878, filed on February 20, 2014).
4.17	Intelsat S.A.'s Bonus Plan (incorporated by reference to Exhibit 4.40 of Intelsat S.A.'s Annual Report on Form 20-F, File No. 001-35878, filed on February 20, 2014).
4.18	Supplement No. 2 to Guarantee, dated as of July 31, 2012, by and between Intelsat Luxembourg Investment S.à r.l. and Bank of America, N.A. (incorporated by reference to Exhibit 10.2 of Intelsat Investments S.A.'s Quarterly Report on Form 10-Q for the quarter ended June 30, 2012, File No. 000-50262, filed on August 1, 2012).
4.19	Agreement for the Adherence by Intelsat Luxembourg Investment S.à r.l. and Intelsat Corporation to the Luxembourg Shares and Beneficiary Certificates Pledge Agreement, dated as of January 12, 2011, and for the Amendment of the Pledge Agreement, dated as of July 31, 2012, by and among the Pledgors listed therein and Wilmington Trust, National Association (as successor by merger to Wilmington Trust FSB), as Collateral Trustee (incorporated by reference to Exhibit 10.3 of Intelsat Investments S.A.'s Quarterly Report on Form 10-Q for the quarter ended June 30, 2012, File No. 000-50262, filed on August 1, 2012).
4.20	Supplement No. 2 to Security and Pledge Agreement, dated as of July 31, 2012, by and among Intelsat Luxembourg Investment S.à r.l., as New Guarantor, Bank of America, N.A., as Administrative Agent and Wilmington Trust, National Association (as successor by merger to Wilmington Trust FSB), as Collateral Trustee (incorporated by reference to Exhibit 10.4 of Intelsat Investments S.A.'s Quarterly Report on Form 10-Q for the quarter ended June 30, 2012, File No. 000-50262, filed on August 1, 2012).

Table of Contents

Exhibit No.	Document Description
4.21	Collateral Agency and Intercreditor Joinder, dated as of July 31, 2012, by and between Intelsat Luxembourg Investment S.à r.l. and Wilmington Trust, National Association (as successor by merger to Wilmington Trust FSB), as Collateral Trustee (incorporated by reference to Exhibit 10.5 of Intelsat Investments S.A.'s Quarterly Report on Form 10-Q for the quarter ended June 30, 2012, File No. 000-50262, filed on August 1, 2012).
4.22	Form of Indemnification Agreement between Intelsat S.A. and its directors and officers (previously filed as Exhibit 10.64 to Amendment No. 2 to Intelsat Global Holdings S.A.'s Registration Statement on Form F-1, File No. 333-181527, filed on August 8, 2012).
4.23	Supplement No. 3 to Guarantee, dated as of January 31, 2013, to the Guarantee dated as of January 12, 2011, by and among Intelsat Align S.à r.l. and Intelsat Finance Nevada LLC, as New Guarantors, and Bank of America, N.A., as Administrative Agent (incorporated by reference to Exhibit 10.84 of Intelsat Investments S.A.'s Annual Report on Form 10-K, File No. 000-50262, filed on February 28, 2013).
4.24	Agreement for the Adherence by Intelsat Align S.à r.l. to the Luxembourg Shares and Beneficiary Certificates Pledge Agreement, dated as of January 12, 2011, and for the Amendment of the Pledge Agreement, dated as of January 31, 2013, by and among the Pledgors listed therein and Wilmington Trust, National Association (as successor by merger to Wilmington Trust FSB), as Collateral Trustee (incorporated by reference to Exhibit 10.85 of Intelsat Investments S.A.'s Annual Report on Form 10-K, File No. 000-50262, filed on February 28, 2013).
4.25	Supplement No. 3 to Security and Pledge Agreement, dated as of January 31, 2013, to the Security and Pledge Agreement dated as of January 12, 2011, by and among Intelsat Align S.àr.l. and Intelsat Nevada LLC, as New Guarantors, Bank of America, N.A., as Administrative Agent and Wilmington Trust, National Association (as successor by merger to Wilmington Trust FSB), as Collateral Trustee (incorporated by reference to Exhibit 10.86 of Intelsat Investments S.A.'s Annual Report on Form 10-K, File No. 000-50262, filed on February 28, 2013).
4.26	Collateral Agency and Intercreditor Joinder, dated as of January 31, 2013, by and among Intelsat Align S.à r.l. and Intelsat Nevada LLC, as new Grantors, and Wilmington Trust, National Association (as successor by merger to Wilmington Trust FSB), as Collateral Trustee (incorporated by reference to Exhibit 10.87 of Intelsat Investments S.A.'s Annual Report on Form 10-K, File No. 000-50262, filed on February 28, 2013).
4.27	Collateral Agency and Intercreditor Joinder, dated as of November 25, 2015, by and among Intelsat Ireland Operations Limited, as new Grantor, and Wilmington Trust, National Association (as successor by merger to Wilmington Trust FSB), as Collateral Trustee (incorporated by reference to Exhibit 4.46 of Intelsat S.A.'s Annual Report on Form 20-F, File No. 001-35878, filed on March 8, 2016).
4.28	Guarantee, dated as of January 31, 2013, made among Intelsat Align S.à r.l. and Intelsat Finance Nevada LLC, as New Guarantors, and Credit Suisse AG, Cayman Islands Branch (f/k/a Credit Suisse, Cayman Island Branch), as Administrative Agent (incorporated by reference to Exhibit 10.88 of Intelsat Investments S.A.'s Annual Report on Form 10-K, File No. 000-50262, filed on February 28, 2013).
4.29	Guarantee, dated as of January 31, 2013, made among Intelsat Align S.à r.l. and Intelsat Finance Nevada LLC, as New Guarantors, and Bank of America, N.A., as Administrative Agent (incorporated by reference to

	Exhibit 10.89 of Intelsat Investments S.A.'s Annual Report on Form 10-K, File No. 000-50262, filed on February 28, 2013).
4.30	Supplement No. 5 to Guarantee, dated as of November 25, 2015, to the Guarantee dated as of January 12, 2011, by and between Intelsat Ireland Operations Limited, as New Guarantor, and Bank of America, N.A., as Administrative Agent (incorporated by reference to Exhibit 4.49 of Intelsat S.A.'s Annual Report on Form 20-F, File No. 001-35878, filed on March 8, 2016).
4.31	Employment Agreement, dated as of March 18, 2013, by and between Intelsat Corporation and Stephen Spengler (incorporated by reference to Exhibit 10.77 to Amendment No. 7 to Intelsat Global Holdings S.A.'s Registration Statement on Form F-1, File No. 333-181527, filed on March 20, 2013).
4.32	Employment Agreement, dated as of March 18, 2013, by and among Intelsat Global Holdings S.A., Intelsat S.A. and Michelle Bryan (incorporated by reference to Exhibit 10.78 to Amendment No. 7 to Intelsat Global Holdings S.A.'s Registration Statement on Form F-1, File No. 333-181527, filed on March 20, 2013).
4.33	Second Amendment, dated as of December 11, 2014, to Employment Agreement, dated as of March 18, 2013, by and between Stephen Spengler and Intelsat Corporation (incorporated by reference to Exhibit 4.63 to Intelsat S.A.'s Annual Report on Form 20-F, File No. 001-35878, filed on February 18, 2015).
4.34	Amendment to Intelsat S.A.'s 2013 Equity Incentive Plan, effective as of October 23, 2014 (incorporated by reference to Exhibit 4.64 to Intelsat S.A.'s Annual Report on Form 20-F, File No. 001-35878, filed on February 8, 2015).
4.35	Second Amendment to Intelsat S.A.'s 2013 Equity Incentive Plan, effective as of June 16, 2016 (incorporated by reference to Exhibit 10.3 of Intelsat S.A.'s Registration Statement on Form S-8, File No. 333-212417, filed on July 6, 2016).
4.36	Collateral Agency and Intercreditor Joinder, dated as of July 31, 2012, between Intelsat Luxembourg Investment S.a r.l. and Wilmington Trust, National Association (as successor by merger to Wilmington Trust FSB), as Collateral Trustee (incorporated by reference to Exhibit10.5 of Intelsat Investments S.A.'s Quarterly Report on Form 10-Q for the quarter ended June 30, 2012, File No. 000-50262, filed on August 1, 2012).
4.37	Collateral Agency and Intercreditor Joinder, dated as of March 29, 2016, by and among Intelsat (Luxembourg) S.A., Intelsat Jackson Holdings S.A., the other grantors from time to time party thereto, Bank of America, N.A., as Administrative Agent under the Existing Credit Agreement, each additional First Lien Representative from time to time a party thereto, each Second Lien Representative from time to time a party thereto and Wilmington Trust, National Association (as successor by merger to Wilmington Trust FSB), as Collateral Trustee (incorporated by reference to Exhibit 4.52 of Intelsat S.A.'s Annual Report on Form 20-F, File No. 000-35878, filed on February 28, 2017, as amended).

Table of Contents

Exhibit No.	Document Description
4.38	Collateral Agency and Intercreditor Joinder, dated as of June 30, 2016, by and among Intelsat (Luxembourg) S.A., Intelsat Jackson Holdings S.A., the other grantors from time to time party thereto, Bank of America, N.A., as Administrative Agent under the Existing Credit Agreement, each additional First Lien Representative from time to time a party thereto, each Second Lien Representative from time to time a party thereto and Wilmington Trust, National Association (as successor by merger to Wilmington Trust FSB), as Collateral Trustee (incorporated by reference to Exhibit 4.53 of Intelsat S.A.'s Annual Report on Form 20-F, File No. 000-35878, filed on February 28, 2017, as amended).
4.39	Amendment Agreement to the Luxembourg Shares and Beneficiary Certificates Pledge Agreement, dated as of March 23, 2016, by and among Intelsat (Luxembourg) S.A., Intelsat Jackson Holdings S.A., Intelsat Operations S.A., and Intelsat Corporation, as Pledgors, and Wilmington Trust, National Association (as successor by merger to Wilmington Trust FSB), as Collateral Trustee or Pledgee (incorporated by reference to Exhibit 4.54 of Intelsat S.A.'s Annual Report on Form 20-F, File No. 000-35878, filed on February 28, 2017, as amended).
4.40	Confirmation and Amendment Agreement to the Luxembourg Claims Pledge Agreement, dated as of October 24, 2016, by and among Intelsat Jackson Holdings S.A., Intelsat Operations S.A. and Intelsat Align S.à r.l., as Pledgors, and Wilmington Trust, National Association (as successor by merger to Wilmington Trust FSB), as Collateral Trustee or Pledgee (incorporated by reference to Exhibit 4.55 of Intelsat S.A.'s Annual Report on Form 20-F, File No. 000-35878, filed on February 28, 2017, as amended).
4.41	Confirmation and Amendment Agreement to the Luxembourg Shares and Beneficiary Certificates Pledge Agreement, dated as of October 24, 2016, by and among Intelsat (Luxembourg) S.A., Intelsat Jackson Holdings S.A., Intelsat Operations S.A., and Intelsat Corporation, as Pledgors, and Wilmington Trust, National Association (as successor by merger to Wilmington Trust FSB), as Collateral Trustee or Pledgee (incorporated by reference to Exhibit 4.56 of Intelsat S.A.'s Annual Report on Form 20-F, File No. 000-35878, filed on February 28, 2017, as amended).
4.42	Collateral Agency and Intercreditor Joinder, dated as of December 22, 2016, by and among Intelsat Connect Finance S.A., Intelsat (Luxembourg) S.A., Intelsat Jackson Holdings S.A., the other grantors from time to time party thereto, Bank of America, N.A., as Administrative Agent under the Existing Credit Agreement, each additional First Lien Representative from time to time a party thereto, each Second Lien Representative from time to time a party thereto and Wilmington Trust, National Association (as successor by merger to Wilmington Trust FSB), as Collateral Trustee (incorporated by reference to Exhibit 4.57 of Intelsat S.A.'s Annual Report on Form 20-F, File No. 000-35878, filed on February 28, 2017, as amended).
4.43	Joinder No. 1 to Credit Agreement, dated as of December 22, 2016, by and between Intelsat Connect Finance S.A. and Bank of America, N.A., as Administrative Agent (incorporated by reference to Exhibit 4.58 of Intelsat S.A.'s Annual Report on Form 20-F, File No. 000-35878, filed on February 28, 2017, as amended).
4.44	Release of Intelsat (Luxembourg) S.A. from Credit Agreement, dated as of December 22, 2016, by Bank of America, N.A., as Administrative Agent (incorporated by reference to Exhibit 4.59 of Intelsat S.A.'s Annual Report on Form 20-F, File No. 000-35878, filed on February 28, 2017, as amended).

4.45	Confirmation and Amendment Agreement to the Luxembourg Claims Pledge Agreement, dated as of December 22, 2016, by and among Intelsat Jackson Holdings S.A., Intelsat Operations S.A., Intelsat Align S.à r.l. and Intelsat Connect Finance S.A. as Pledgors, and Wilmington Trust, National Association (as successor by merger to Wilmington Trust FSB), as Collateral Trustee or Pledgee (incorporated by reference to Exhibit 4.60 of Intelsat S.A.'s Annual Report on Form 20-F, File No. 000-35878, filed on February 28, 2017, as amended).
4.46	Amendment Agreement to the Luxembourg Shares and Beneficiary Certificates Pledge Agreement, dated as of December 22, 2016, by and among Intelsat (Luxembourg) S.A., Intelsat Jackson Holdings S.A., Intelsat Operations S.A., Intelsat Connect Finance S.A. and Intelsat Corporation, as Pledgors, and Wilmington Trust, National Association (as successor by merger to Wilmington Trust FSB), as Collateral Trustee or Pledgee (incorporated by reference to Exhibit 4.61 of Intelsat S.A.'s Annual Report on Form 20-F, File No. 000-35878, filed on February 28, 2017, as amended).
8.1	List of significant subsidiaries of Intelsat S.A.*
12.1	Rule 13a-14(a)/15d-14(a) Certification of Principal Executive Officer.*
12.2	Rule 13a-14(a)/15d-14(a) Certification of Principal Financial Officer.*
13.1	Certification of Chief Executive Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.*
13.2	Certification of Chief Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.*
15.1	Consent of KPMG LLP*
101.	Interactive Data Files
101.INS	XBRL Instance Document. **
101.SCH	XBRL Taxonomy Extension Schema Document. **
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document. **
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document. **
101.LAB	XBRL Taxonomy Extension Label Linkbase Document. **
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document. **

*Filed herewith.

Table of Contents

** Attached as Exhibit 101 to this Annual Report on Form 20-F are the following formatted in Extensible Business Reporting Language ("XBRL"): (i) Consolidated Balance Sheets, (ii) Consolidated Statements of Operations, (iii) Consolidated Statements of Comprehensive Loss, (iv) Consolidated Statements of Changes in Shareholders' Deficit, (v) Consolidated Statements of Cash Flows and (vi) Notes to Consolidated Financial Statements.

Table of Contents

SIGNATURE

The registrant hereby certifies that it meets all of the requirements for filing on Form 20-F and that it has duly caused and authorized the undersigned to sign this Annual Report on its behalf.

INTELSAT S.A.

Date: February 20, 2019 By /s/ STEPHEN SPENGLER
Stephen Spengler
Chief Executive Officer

Date: February 20, 2019 By /s/ JACQUES KERREST
Jacques Kerrest
Executive Vice President and Chief Financial Officer

Table of Contents

Intelsat S.A.
Index to Consolidated Financial Statements

	Page
Report of Independent Registered Public Accounting Firm	F- 2
Consolidated Balance Sheets as of December 31, 2017 and 2018	F- 4
Consolidated Statements of Operations for the Years Ended December 31, 2016, 2017 and 2018	F- 5
Consolidated Statements of Comprehensive Income (Loss) for the Years Ended December 31, 2016, 2017 and 2018	F- 6
Consolidated Statements of Changes in Shareholders' Deficit for the Years Ended December 31, 2016, 2017 and 2018	F- 7
Consolidated Statements of Cash Flows for the Years Ended December 31, 2016, 2017 and 2018	F- 8
Notes to Consolidated Financial Statements	F- 10
Schedule II – Valuation and Qualifying Accounts for the Years Ended December 31, 2016, 2017 and 2018	F- 53

Table of Contents

PART I. FINANCIAL INFORMATION

Item 1. Financial Statements

Report of Independent Registered Public Accounting Firm
To the Shareholders and Board of Directors
Intelsat S.A.:

Opinions on the Consolidated Financial Statements and Internal Control Over Financial Reporting
We have audited the accompanying consolidated balance sheets of Intelsat S.A. and subsidiaries (the Company) as of December 31, 2017 and 2018, the related consolidated statements of operations, comprehensive income (loss), changes in shareholders' deficit, and cash flows for each of the years in the three-year period ended December 31, 2018, and the related notes and financial statement Schedule II - Valuation and Qualifying Accounts (collectively, the consolidated financial statements). We also have audited the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission.
In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2017 and 2018, and the results of its operations and its cash flows for each of the years in the three-year period ended December 31, 2018, in conformity with U.S. generally accepted accounting principles. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018 based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission.
Change in Accounting Principle
As discussed in Note 2 to the consolidated financial statements, the Company has changed its method of accounting for revenue effective January 1, 2018 due to the adoption of Accounting Standards Codification No. 606, Revenue from Contracts with Customers.
Basis for Opinions
The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Part II, Item 15b Management's Annual Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's consolidated financial statements and an opinion on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.
We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.
Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included

performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Table of Contents

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ KPMG LLP

We have served as the Company's auditor since 2002.

McLean, Virginia

February 20, 2019

Table of Contents

INTELSAT S.A.
CONSOLIDATED BALANCE SHEETS
(in thousands, except per share amounts)

	December 31, 2017	December 31, 2018
ASSETS		
Current assets:		
Cash and cash equivalents	$525,215	$485,120
Restricted cash	16,176	22,037
Receivables, net of allowances of $29,669 in 2017 and $28,542 in 2018	221,223	271,393
Contract assets	—	45,034
Prepaid expenses and other current assets	56,862	24,075
Total current assets	819,476	847,659
Satellites and other property and equipment, net	5,923,619	5,511,702
Goodwill	2,620,627	2,620,627
Non-amortizable intangible assets	2,452,900	2,452,900
Amortizable intangible assets, net	349,584	311,103
Contract assets, net of current portion	—	96,108
Other assets	443,830	401,414
Total assets	$12,610,036	$12,241,513
LIABILITIES AND SHAREHOLDERS' DEFICIT		
Current liabilities:		
Accounts payable and accrued liabilities	$116,396	$108,101
Taxes payable	12,007	5,679
Employee related liabilities	29,328	29,696
Accrued interest payable	263,207	284,649
Current portion of long-term debt	96,572	—
Contract liabilities	—	137,746
Deferred satellite performance incentives	25,780	35,261
Deferred revenue	149,749	—
Other current liabilities	47,287	59,080
Total current liabilities	740,326	660,212
Long-term debt, net of current portion	14,112,086	14,028,352
Contract liabilities, net of current portion	—	1,131,319
Deferred satellite performance incentives, net of current portion	215,352	210,346
Deferred revenue, net of current portion	794,707	—
Deferred income taxes	48,434	82,488
Accrued retirement benefits	191,079	133,735
Other long-term liabilities	296,616	77,670
Shareholders' deficit:		
Common shares; nominal value $0.01 per share	1,196	1,380
Paid-in capital	2,173,367	2,551,471
Accumulated deficit	(5,894,659)	(6,606,426)
Accumulated other comprehensive loss	(87,774)	(43,430)
Total Intelsat S.A. shareholders' deficit	(3,807,870)	(4,097,005)
Noncontrolling interest	19,306	14,396
Total liabilities and shareholders' deficit	$12,610,036	$12,241,513

See accompanying notes to consolidated financial statements.

Table of Contents

INTELSAT S.A.
CONSOLIDATED STATEMENTS OF OPERATIONS
(in thousands, except per share amounts)

	Year Ended December 31, 2016	Year Ended December 31, 2017	Year Ended December 31, 2018
Revenue	$ 2,188,047	$ 2,148,612	$ 2,161,190
Operating expenses:			
Direct costs of revenue (excluding depreciation and amortization)	342,634	324,232	330,874
Selling, general and administrative	232,537	205,475	200,857
Depreciation and amortization	694,891	707,824	687,589
Total operating expenses	1,270,062	1,237,531	1,219,320
Income from operations	917,985	911,081	941,870
Interest expense, net	938,501	1,020,770	1,212,374
Gain (loss) on early extinguishment of debt	1,030,092	(4,109)	(199,658)
Other income, net	522	10,114	4,541
Income (loss) before income taxes	1,010,098	(103,684)	(465,621)
Provision for income taxes	15,986	71,130	130,069
Net income (loss)	994,112	(174,814)	(595,690)
Net income attributable to noncontrolling interest	(3,915)	(3,914)	(3,915)
Net income (loss) attributable to Intelsat S.A.	$ 990,197	$ (178,728)	$ (599,605)
Net income (loss) per common share attributable to Intelsat S.A.:			
Basic	$ 8.65	$ (1.50)	$ (4.63)
Diluted	$ 8.36	$ (1.50)	$ (4.63)

See accompanying notes to consolidated financial statements.

Table of Contents

INTELSAT S.A.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)

(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)
Other comprehensive income (loss), net of tax:			
Defined benefit retirement plans:			
Reclassification adjustment for amortization of unrecognized prior service credits, net of tax included in other income, net	(5)	21	(839)
Reclassification adjustment for amortization of unrecognized actuarial loss, net of tax included in other income, net	2,223	2,074	4,064
Actuarial gain (loss) arising during the year, net of tax	(177)	(13,896)	2,960
Benefit plan amendment, net of tax of $0.7 million	—	—	38,510
Marketable securities:			
Unrealized gains on investments, net of tax	285	567	—
Reclassification adjustment for realized gain on investments, net of tax	(192)	(235)	—
Reclassification adjustment for pension assets' gains, net of tax included in other income, net	—	—	(351)
Other comprehensive income (loss)	2,134	(11,469)	44,344
Comprehensive income (loss)	996,246	(186,283)	(551,346)
Comprehensive income attributable to noncontrolling interest	(3,915)	(3,914)	(3,915)
Comprehensive income (loss) attributable to Intelsat S.A.	$ 992,331	$ (190,197)	$ (555,261)

See accompanying notes to consolidated financial statements.

Table of Contents

INTELSAT S.A.
CONSOLIDATED STATEMENTS OF CHANGES IN SHAREHOLDERS' DEFICIT
(in thousands)

	Preferred Shares (in millions)	Amount	Common Shares (in millions)	Amount	Paid-in Capital	Accumulated Deficit	Accumulated Other Comprehensive Loss	Total Intelsat S.A. Shareholders' Deficit	Noncontrolling Interest
Balance at December 31, 2015	3.5	$ 35	107.6	$ 1,076	$2,133,891	$(6,706,128)	$ (78,439)	$(4,649,565)	$ 29,212
Net income	—	—	—	—	—	990,197	—	990,197	3,915
Dividends paid to noncontrolling interests	—	—	—	—	—	—	—	—	(8,980)
Share-based compensation	—	—	0.8	8	23,081	—	—	23,089	—
Preferred shares conversion	(3.5)	(35)	9.6	96	(61)	—	—	—	—
Postretirement/pension liability adjustment, net of tax of $1.0 million	—	—	—	—	—	—	2,041	2,041	—
Other comprehensive income, net of tax of $0.2 million	—	—	—	—	—	—	93	93	—
Balance at December 31, 2016	—	$ —	118.0	$ 1,180	$2,156,911	$(5,715,931)	$ (76,305)	$(3,634,145)	$ 24,147
Net income (loss)	—	—	—	—	—	(178,728)	—	(178,728)	3,914
Dividends paid to noncontrolling interests	—	—	—	—	—	—	—	—	(8,755)
Share-based compensation	—	—	1.6	16	16,456	—	—	16,472	—
Postretirement/pension liability adjustment, net of tax of ($3.1) million	—	—	—	—	—	—	(11,801)	(11,801)	—
Other comprehensive income, net of tax of $0.2 million	—	—	—	—	—	—	332	332	—
Balance at December 31, 2017	—	$ —	119.6	$ 1,196	$2,173,367	$(5,894,659)	$ (87,774)	$(3,807,870)	$ 19,306
Net income (loss)	—	—	—	—	—	(599,605)	—	(599,605)	3,915
Dividends paid to noncontrolling interests	—	—	—	—	—	—	—	—	(8,825)
Share-based compensation	—	—	2.9	29	10,006	—	—	10,035	—
Equity offering and 2025 Convertible Notes offering	—	—	15.5	155	368,098	—	—	368,253	—
	—	—	—	—	—	—	6,185	6,185	—

Postretirement/pension liability adjustment, net of tax of $0.6 million									
Benefit plan amendment, net of tax of $0.7 million	—	—	—	—	—	—	38,510	38,510	—
Other comprehensive income, net of tax of ($0.2) million	—	—	—	—	—	—	(351)	(351)	—
Adoption of ASU 2014-09 (see Note 2—Significant Accounting Policies)	—	—	—	—	—	(281,741)	—	(281,741)	—
Adoption of ASU 2016-16 (see Note 14—Income Taxes)	—	—	—	—	—	169,579	—	169,579	—
Balance at December 31, 2018	—	$—	138.0	$1,380	$2,551,471	$(6,606,426)	$(43,430)	$(4,097,005)	$14,396

See accompanying notes to consolidated financial statements.

Table of Contents

INTELSAT S.A.
CONSOLIDATED STATEMENTS OF CASH FLOWS
(in thousands)

	Year Ended December 31, 2016	Year Ended December 31, 2017	Year Ended December 31, 2018
Cash flows from operating activities:			
Net income (loss)	$ 994,112	$ (174,814)	$ (595,690)
Adjustments to reconcile net income (loss) to net cash provided by operating activities:			
Depreciation and amortization	694,891	707,824	687,589
Provision for (benefit from) doubtful accounts	24,591	(4,094)	(836)
Foreign currency transaction (gain) loss	(3,300)	(876)	6,736
Loss on disposal of assets	20	45	46
Share-based compensation	23,222	15,995	6,824
Deferred income taxes	(9,737)	43,931	79,160
Amortization of discount, premium, issuance costs and related costs	24,622	48,696	48,495
(Gain) loss on early extinguishment of debt	(1,030,092)	4,109	199,658
Unrealized (gains) losses on derivative financial instruments	(764)	275	(14,685)
Amortization of actuarial loss and prior service credits for retirement benefits	3,361	3,287	3,823
Other non-cash items	220	(287)	1,178
Changes in operating assets and liabilities:			
Receivables	6,478	(14,333)	(63,814)
Prepaid expenses, contract and other assets	(51,388)	(24,760)	3,708
Accounts payable and accrued liabilities	35,850	(42,337)	7,291
Accrued interest payable	43,347	58,367	21,442
Deferred revenue and contract liabilities	(58,796)	(134,577)	(39,763)
Accrued retirement benefits	(9,385)	(13,422)	(15,902)
Other long-term liabilities	(8,497)	(8,783)	8,913
Net cash provided by operating activities	678,755	464,246	344,173
Cash flows from investing activities:			
Payments for satellites and other property and equipment (including capitalized interest)	(714,570)	(461,627)	(255,696)
Purchase of investments	(4,000)	(25,744)	(19,000)
Capital contribution to unconsolidated affiliate	(12,019)	(30,714)	(48,097)
Proceeds from insurance settlements	—	49,788	20,409
Other proceeds from satellites	—	—	18,750
Net cash used in investing activities	(730,589)	(468,297)	(283,634)
Cash flows from financing activities:			
Proceeds from issuance of long-term debt	1,730,200	1,500,000	4,585,875
Repayments of long-term debt	(791,944)	(1,500,000)	(4,782,451)
Debt issuance costs	(48,900)	(41,237)	(49,436)
Debt modification fees	—	—	(3,954)
Proceeds from stock issuance, net of issuance costs	—	—	224,250
Payment of premium on early extinguishment of debt	(32)	—	(33,890)
Payments on tender, debt exchange and consent	(293,276)	(14)	—

Dividends paid to preferred shareholders	(4,959)	—	—
Other payments for satellites	(18,333)	(35,396)	—
Principal payments on deferred satellite performance incentives	(17,429)	(37,186)	(25,488)
Dividends paid to noncontrolling interest	(8,980)	(8,755)	(8,825)
Proceeds from exercise of employee stock options	—	476	3,211
Other financing activities	—	414	385
Net cash provided by (used in) financing activities	546,347	(121,698)	(90,323)
Effect of exchange rate changes on cash and cash equivalents	(30)	1,116	(4,450)
Net change in cash, cash equivalents and restricted cash	494,483	(124,633)	(34,234)
Cash, cash equivalents and restricted cash, beginning of period	171,541	666,024	541,391
Cash, cash equivalents and restricted cash, end of period	$ 666,024	$ 541,391	$ 507,157

Table of Contents

Supplemental cash flow information:			
Interest paid, net of amounts capitalized	$870,370	$915,627	$1,052,885
Income taxes paid, net of refunds	22,687	33,731	57,085
Supplemental disclosure of non-cash investing activities:			
Accrued capital expenditures and payments for satellites	$127,008	$38,450	$28,203
Capitalization of deferred satellite performance incentives	69,909	44,445	28,161
Supplemental disclosure of non-cash financing activities:			
Repayments of long-term debt	$1,468,401	$—	$—
Issuance of long-term debt	(731,884)	—	—
Discount on long-term debt	212,660	—	—
Write-off of debt issuance costs	(9,253)	—	—

See accompanying notes to consolidated financial statements.

Table of Contents

INTELSAT S.A.
NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS
Note 1 Background of Company
Intelsat S.A. (the “Company”, “we”,” us” or “our”) provides satellite communications services worldwide through a global communications network of 54 satellites and ground facilities related to the satellite operations and control, and teleport services.
Note 2 Significant Accounting Policies
(a) Principles of Consolidation

The accompanying consolidated financial statements include the accounts of Intelsat S.A., its wholly-owned subsidiaries, and variable interest entities (“VIE”) of which we are the primary beneficiary, and are prepared in conformity with accounting principles generally accepted in the United States of America (“U.S. GAAP”). We are the primary beneficiary of one VIE, as more fully described in Note 10—Investments, and accordingly, we include in our consolidated financial statements the assets and liabilities and results of operations of the entity, even though we may not own a majority voting interest. We use the equity method to account for our investments in entities where we exercise significant influence over operating and financial policies but do not retain control under either the voting interest model (generally 20% to 50% ownership interest) or the variable interest model. In 2015, we entered into a joint venture agreement as further described in Note 10—Investments, and the investment is accounted for using the equity method. We have eliminated all significant intercompany accounts and transactions.
(b) Use of Estimates
The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities as of the date of the financial statements, the reported amounts of revenues and expenses during the reporting periods, and the disclosures of contingent liabilities. Accordingly, ultimate results could differ from those estimates.
(c) Revenue Recognition
Revenue from Contracts with Customers
We earn revenue primarily by providing services over satellite transponder capacity to our customers. Our customers generally obtain satellite services from us by placing an order pursuant to one of several master customer service agreements and related service orders. The service agreements specify, among other things, the amount of satellite bandwidth or throughput to be provided, whether service will be non-pre-emptible or pre-emptible and the service term. Most 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 as small as increments of one hour. Our 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 service 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. To determine the proper revenue recognition method for contracts, we evaluate whether two or more services should be combined and accounted for as a single performance obligation. Our specific revenue recognition policies are as follows:
Satellite Utilization Charges. 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. We have

certain obligations, including providing spare or substitute capacity if

Table of Contents

available, in the event of satellite service failure under certain long-term agreements. We are generally not obligated to refund satellite utilization payments previously made.

Satellite Related Consulting and Technical Services. We recognize revenue from the provision of consulting services as those services are performed. We recognize revenue for consulting services with specific performance obligations, such as transfer orbit support services or training programs over the service period.

Tracking, Telemetry and Commanding ("TT&C"). We earn TT&C services revenue from providing operational services to other satellite owners and from certain customers on our satellites. TT&C agreements entered into in connection with our satellite utilization contracts are typically for the period of the related service agreement. We recognize this revenue over the term of the service agreement.

In-Orbit Backup Services. We provide back-up transponder capacity that is held on reserve for certain customers on agreed-upon terms. We recognize revenues for in-orbit protection services over the term of the related agreement.

Revenue Share Arrangements. We recognize revenues under revenue share agreements for satellite-related services either on a gross or net basis in accordance with principal versus agent considerations.

We occasionally sell products or services individually or in some combination to our customers. When products or services are sold together, we allocate revenue for each performance obligation based on each obligation's relative selling price. In these arrangements, revenue for products is recognized when the transfer of control passes to the customer, while service revenue is recognized over the service term.

Contract Assets

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

Contract liabilities consist of advance payments and collections in excess of revenue recognized and deferred revenue. Our contracts at times contain prepayment terms that range from one month to one year in advance of providing the service. As a practical expedient, we do not need to adjust the promised amount of consideration for the effects of a significant financing component if we expect, at contract inception, that the period between when the Company transfers a promised good or service to a customer and when the customer pays for that good or service will be one year or less. For a small subset of contracts with advance payments that contain prepayment terms greater than one year and up to 15 years, we assess whether a significant financing component exists by considering the difference between the amount of promised consideration and the cash selling price of the promised services. The prepayment amount is generally based on a standard methodology that discounts the total of the standard monthly charges over the service term to determine the prepayment amount, resulting in a difference between the amount of promised consideration and the cash selling price of the promised services. The Company considers the timing difference between payment and the promised transfer of services, combined with the Company's incremental borrowing rates, to determine whether a significant financing component exists. When a significant financing component exists, the amount of revenue recognized exceeds the amount of cash received from the customer. After receiving cash from the customer but prior to the Company providing services, the Company records additional contract liabilities as well as offsetting interest expense to reflect the upfront financing the Company is effectively receiving from the customer. Once the Company begins providing services, additional interest expense is recorded each period, using the effective interest method, as well as corresponding additional revenue which is recognized ratably over the service period.

For the year ended December 31, 2018, we recognized revenue of $247.0 million that was included in the contract liability balance as of January 1, 2018. In addition, the total amount of consideration included in contract assets as of January 1, 2018 that became unconditional for the year ended December 31, 2018 was $11.0 million.

Our remaining performance obligation, which we refer to as contracted backlog, is our expected future revenue under existing customer contracts, and includes both cancelable and non-cancelable contracts. Our remaining performance obligation was approximately $8.1 billion as of December 31, 2018, approximately 88% of which related to contracts that were non-cancelable and approximately 11% related to contracts that were cancelable subject to substantial

termination fees. We assess the contract term of our cancelable contracts as the full stated term of the contract assuming each contract is not canceled since the termination penalty upon cancellation is substantive. As of December 31, 2018, the weighted average remaining customer contract life was approximately 4.5 years. Approximately 38%, 21%, and 41% of our total remaining performance obligation as

Table of Contents

of December 31, 2018 is expected to be recognized as revenue during 2019 and 2020, 2021 and 2022, and 2023 and thereafter, respectively. The amount included in the remaining performance obligation 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 remaining performance obligation amount, is generally calculated as a percentage of the remaining performance obligation 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 remaining performance obligation includes 100% of the remaining performance obligation of our consolidated ownership interests, which is consistent with the accounting for our ownership interest in these entities.

Assets Recognized from the Costs to Obtain a Customer Contract

We recognize an asset for the incremental costs of obtaining a contract with a customer if we expect the benefit of those costs to be longer than one year. We have determined that our sales incentive program meets the requirements to be capitalized due to the incremental nature of the costs and the expectation that the Company will recover such costs. The assets recognized from the costs to obtain a customer contract are amortized over a period that is consistent with the transfer to the customer of the services to which the asset relates. We capitalized $6.6 million for our sales incentive program and amortized $6.5 million for the year ended December 31, 2018.

Contract Modifications

Contracts are often modified to account for changes in contract specifications or requirements. We consider contract modifications to exist when the modification either creates new rights or obligations or changes the existing enforceable rights and obligations of either party. Most of our contract modifications are for goods and services that are distinct from the existing contract, as they consist of additional months of service priced at the Company's standalone selling prices of the additional services and are therefore treated as separate contracts. For contract modifications that do not result in additional distinct goods or services, the effect of a contract modification on the transaction price and our measure of progress for the performance obligation to which it relates is recognized as an adjustment to revenue.

Significant Judgments

We occasionally enter into certain contracts in which the customer makes payments in advance of services to be delivered, which may be years in the future. The reasons for the prepayments in these contracts vary, but generally can be either for the customer's benefit or for the Company's benefit (ability to use the cash received from the customer to pay for the construction of a satellite asset). The determination of whether contracts with a prepayment provision contain a significant financing component requires judgment. The Company makes this determination based on various factors, including the differences between the amount of promised consideration and cash selling prices, the length of time between payment and the transfer of services and prevailing interest rates in the market.

Our contracts generally contain multiple performance obligations. When a contract is separated into multiple performance obligations, we allocate the total transaction price to each performance obligation in an amount based on the estimated relative standalone selling price of the promised good or service underlying such performance obligation. Judgment is required to determine the standalone selling price for each distinct performance obligation. In order to estimate standalone selling prices, we use an adjusted market assessment approach which involves an evaluation of the market and an estimate of the price that our customers are willing to pay, or an expected cost plus a margin approach.

When more than one party is involved in providing goods or services to a customer, we generally recognize the transaction on a gross basis due to the level of control that we have prior to the transfer of the good or service. Judgment is required in determining whether we are the principal or the agent in transactions involving third parties.

(d) Fair Value Measurements

We estimate the fair value of our financial instruments using available market information and valuation methodologies. The carrying amounts of cash and cash equivalents, receivables, accounts payable and accrued liabilities approximate their fair values because of the short maturity of these financial instruments.

FASB ASC Topic 820, Fair Value Measurements and Disclosure (“FASB ASC 820”) defines fair value as the price that would be received in the sale of an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. FASB ASC 820 requires disclosure of the extent to which fair value is used to measure financial assets and liabilities, the inputs utilized in calculating valuation measurements, and the effect of the measurement of significant unobservable inputs on earnings, or changes in net assets, as of the measurement date. FASB ASC 820 establishes a three-level

Table of Contents

valuation hierarchy based upon the transparency of inputs utilized in the measurement and valuation of financial assets or liabilities as of the measurement date. We apply fair value accounting for all financial assets and liabilities and non-financial assets and liabilities that are recognized or disclosed at fair value in the financial statements on a recurring basis.

The fair value hierarchy prioritizes the inputs used in valuation techniques into three levels as follows:

- Level 1—unadjusted quoted prices for identical assets or liabilities in active markets;
- Level 2—quoted prices for similar assets and liabilities in active markets, quoted prices for identical or similar assets or liabilities in markets that are not active, and inputs other than quoted market prices that are observable or that can be corroborated by observable market data by correlation; and
- Level 3—unobservable inputs based upon the reporting entity's internally developed assumptions which market participants would use in pricing the asset or liability.

(e) Cash and Cash Equivalents

Cash and cash equivalents consist of cash on hand and highly liquid investments with original maturities of three months or less, which are generally time deposits with banks and money market funds. The carrying amount of these investments approximates fair value.

(f) Receivables and Allowances for Doubtful Accounts

We provide satellite services and extend credit to numerous customers in the satellite communication, telecommunications and video markets. We monitor our exposure to credit losses and maintain allowances for doubtful accounts and anticipated losses. We believe we have adequate customer collateral and reserves to cover our exposure.

(g) Satellites and Other Property and Equipment

Satellites and other property and equipment are stated at historical cost, or in the case of certain satellites acquired, the fair value at the date of acquisition. Capitalized costs consist primarily of the costs of satellite construction and launch, including launch insurance and insurance during the period of in-orbit testing, the net present value of performance incentives expected to be payable to the satellite manufacturers (dependent on the continued satisfactory performance of the satellites), costs directly associated with the monitoring and support of satellite construction, and interest costs incurred during the period of satellite construction.

We depreciate satellites and other property and equipment on a straight-line basis over the following estimated useful lives:

	Years
Buildings and improvements	10-40
Satellites and related costs	10-17
Ground segment equipment and software	4 -15
Furniture and fixtures and computer hardware	4 -12
Leasehold improvements(1)	2 -12

(1) Leasehold improvements are depreciated over the shorter of the useful life of the improvement or the remaining lease term.

(h) Other Assets

Other assets consist of investments in certain equity securities, long-term deposits, long-term receivables and other miscellaneous deferred charges and long-term assets.

(i) Goodwill and Other Intangible Assets

We account for goodwill and other intangible assets in accordance with FASB ASC Topic 350, Intangibles—Goodwill and Other ("FASB ASC 350"). Goodwill represents the excess of the consideration transferred plus the fair value of any noncontrolling interest in the acquiree at the acquisition date over the fair values of identifiable net assets of

businesses

Table of Contents

acquired. Goodwill and certain other intangible assets deemed to have indefinite lives are not amortized but are tested on an annual basis for impairment during the fourth quarter, or whenever events or changes in circumstances indicate that the carrying amount may not be fully recoverable. See Note 11—Goodwill and Other Intangible Assets.
Intangible assets arising from business combinations are initially recorded at fair value. We record other intangible assets at cost. We amortize intangible assets with determinable lives (consisting of backlog and customer relationships) based on the expected pattern of consumption. We review these intangible assets for impairment whenever facts and circumstances indicate that the carrying amounts may not be recoverable. See Note 11—Goodwill and Other Intangible Assets.
(j) Impairment of Long-Lived Assets
We review long-lived assets, including property and equipment and acquired intangible assets with estimable useful lives, for impairment whenever events or changes in circumstances indicate that the carrying amount of such 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 compared to expectations; and
- shortened useful lives due to changes in the way an asset is used or expected to be used.

The recoverability of an asset to be held and used is determined by comparing the carrying amount 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, we record an impairment charge in the amount by which the carrying amount of the asset exceeds its fair value, which we determine by either a quoted market price, if any, or a value determined by utilizing discounted cash flow techniques.
(k) Income Taxes
We account for income taxes in accordance with FASB ASC Topic 740—Income Taxes. We are subject to income taxes in the United States as well as a number of other foreign jurisdictions. Significant judgment is required in the calculation of our tax provision and the resulting 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 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 or contra asset 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.
(l) Foreign Currency Translation
Our functional currency is the U.S. dollar, since substantially all customer contracts, capital expenditure contracts and operating expense obligations are denominated in U.S. dollars. Transactions not denominated in U.S. dollars have been translated using the spot rates of exchange at the dates of the transactions. We recognize differences on exchange arising on the settlement of the transactions denominated in currencies other than the U.S. dollar in the consolidated statement of operations.
(m) Comprehensive Income

Comprehensive income consists of net income or loss and other gains and losses affecting shareholders' equity that, under U.S. GAAP, are excluded from net income or loss. Such items consist primarily of the change in the market value of pension liability adjustments.

Table of Contents

(n) Share-Based Compensation

Compensation cost is recognized based on the requirements of FASB ASC Topic 718, Compensation—Stock Compensation ("FASB ASC 718"), for all share-based awards granted.

Option awards are measured at the grant date based on the fair value as calculated using either the Black-Scholes option pricing model, a Monte Carlo simulation model, a binomial tree model or any other acceptable model. Awards of shares or restricted share units are valued based on the closing market price at the grant date. The expense is recognized over the requisite service period, based on attainment of certain vesting requirements.

The determination of the value of certain awards requires considerable judgment, including estimating expected volatility, expected term, correlation between share price and market conditions and risk-free rate. The Company's expected volatility is based on either implied volatility of traded options on the shares of the Company or the historical volatility. The expected term is based on the midpoint between the expected vesting time and the remaining contractual life. The risk-free rate is derived from the applicable Constant Maturity Treasury rate.

(o) Deferred Satellite Performance Incentives

The cost of satellite construction may include an element of deferred consideration that we are obligated to pay to satellite manufacturers over the lives of the satellites, provided the satellites continue to operate in accordance with contractual specifications. Historically, the satellite manufacturers have earned substantially all of these payments. Therefore, we account for these payments as deferred financing. 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. Interest expense is recognized on the deferred financing and the liability is reduced as the payments are made.

(p) Derivative Instruments

We enter into derivative transactions primarily to manage our exposure to fluctuations in foreign exchange rates and interest rates. We employ risk management strategies, which may include the use of foreign currency swaps, interest rate swaps and interest rate caps. We measure all derivatives at fair value and recognize them as either assets or liabilities on our consolidated balance sheets. Changes in the fair value of derivative instruments not qualifying as hedges are recognized in earnings in the current period.

(q) New Accounting Pronouncements

In May 2014, the FASB issued Accounting Standard Update ("ASU") 2014-09, Revenue from Contracts with Customers (Topic 606), which supersedes the revenue recognition requirements in FASB ASC Topic 605 - Revenue Recognition. The guidance in ASU 2014-09 clarifies the principles for recognizing revenue by creating a common revenue standard for U.S. GAAP ("ASC 606"). The FASB issued several amendments to the standard, including clarification of accounting for licenses of intellectual property and identifying performance obligations.

We adopted the standard effective January 1, 2018 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 years. 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.

The cumulative effects of the changes made to our consolidated January 1, 2018 balance sheet for the adoption of ASC 606 were as follows (in thousands):

Table of Contents

	As of December 31, 2017	Adjustment	As of January 1, 2018
Consolidated Balance Sheets			
Assets			
Receivables	$221,223	$(11,025)	$210,198
Prepaid expenses and other current assets	56,862	(28,545)	28,317
Contract assets	—	40,618	40,618
Contract assets, net of current portion	—	97,148	97,148
Other assets	443,830	(74,643)	369,187
Liabilities			
Accounts payable and accrued liabilities	$116,396	$(4,071)	$112,325
Deferred revenue	149,749	(149,749)	—
Contract liabilities	—	143,705	143,705
Deferred revenue, net of current portion	794,707	(794,707)	—
Contract liabilities, net of current portion	—	1,164,138	1,164,138
Deferred income taxes	48,434	(43,846)	4,588
Other long-term liabilities	296,616	(10,176)	286,440
Shareholders' deficit			
Accumulated deficit	$(5,894,659)	$(281,741)	$(6,176,400)

The cumulative effect adjustment was comprised of $347.0 million, ($8.5) million, ($7.0) million, and ($49.7) million for the significant financing component, timing of revenue recognition on our multi-product contracts that include both the provision of services and the delivery of equipment that are distinct, cost to obtain a contract adjustment and the related cumulative tax impact, respectively.

In accordance with the new revenue standard requirements, the disclosure of the impact of adoption of ASC 606 on our consolidated statements of operations, balance sheets, and statements of cash flows was as set forth in the tables below (in thousands). The impact to our consolidated statement of other comprehensive income (loss) was an increase in net loss of $56.1 million for the year ended December 31, 2018.

	For the Year Ended December 31, 2018		
	As Reported	Balances without the adoption of ASC 606	Effect of adoption increase (decrease)
Consolidated Statements of Operations			
Revenue	$2,161,190	$ 2,057,983	$ 103,207
Direct costs of revenue (excluding depreciation and amortization)	330,874	331,786	(912)
Selling, general and administrative	200,857	200,973	(116)
Interest expense, net	1,212,374	1,096,184	116,190
Other income, net	4,541	5,329	(788)
Provision for income taxes[1]	130,069	86,720	43,349
Net loss	(595,690)	(539,598)	(56,092)
Net loss attributable to Intelsat S.A.	(599,605)	(543,513)	(56,092)
Net loss per common share attributable to Intelsat S.A.:			
Basic	$(4.63)	$ (4.20)	$ (0.43)
Diluted	$(4.63)	$ (4.20)	$ (0.43)

(1) Provision for income taxes includes a deferred tax asset that was established upon adoption of ASC 606 that was eliminated as a result of the 2018 Internal Reorganization (see Note 14 - Income Taxes).

Table of Contents

	As of December 31, 2018		
	As Reported	Balances without the adoption of ASC 606	Effect of adoption increase (decrease)
Consolidated Balance Sheets			
Assets			
Receivables	$271,393	$278,233	$(6,840)
Prepaid expenses and other current assets	24,075	61,237	(37,162)
Contract assets	45,034	—	45,034
Contract assets, net of current portion	96,108	—	96,108
Other assets	401,414	483,589	(82,175)
Liabilities			
Accounts payable and accrued liabilities	$108,101	$113,627	$(5,526)
Deferred revenue	—	134,799	(134,799)
Contract liabilities	137,746	—	137,746
Deferred revenue, net of current portion	—	763,478	(763,478)
Contract liabilities, net of current portion	1,131,319	—	1,131,319
Taxes payable	5,679	4,886	793
Other long-term liabilities	77,670	83,776	(6,106)
Deferred income taxes	82,488	89,639	(7,151)
Shareholders' deficit			
Accumulated deficit	$(6,606,426)	$(6,268,593)	$(337,833)

	For the Year Ended December 31, 2018		
	As Reported	Balances without the adoption of ASC 606	Effect of adoption increase (decrease)
Consolidated Statement of Cash Flows			
Cash flows from operating activities			
Net loss	$(595,690)	$ (539,598)	$ (56,092)
Adjustments to reconcile net loss to net cash provided by operating activities:			
Deferred income taxes	79,160	42,465	36,695
Other non-cash items	938,828	938,828	—
Changes in operating assets and liabilities:			
Receivables	(63,814)	(59,629)	(4,185)
Prepaid expenses, contract and other assets	3,708	(9,065)	12,773
Accounts payable and accrued liabilities	7,291	7,953	(662)
Accrued interest payable	21,442	21,442	—
Deferred revenue and contract liabilities	(39,763)	(47,164)	7,401
Accrued retirement benefits	(15,902)	(15,902)	—
Other long-term liabilities	8,913	4,843	4,070
Net cash provided by operating activities	$344,173	$ 344,173	$ —

Refer to Note 17—Business and Geographic Segment Information for the required disclosures related to the disaggregation of revenue.

In August 2016, the FASB issued ASU 2016-15, Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments, which addresses specific issues relating to diversity in practice in how certain cash receipts and cash payments are presented and classified in the statement of cash flows. Additionally, in November 2016, the FASB issued ASU 2016-18, Statement of Cash Flows (Topic 230): Restricted Cash (a consensus of the FASB Emerging Issues Task Force), which requires that amounts described as restricted cash and restricted cash equivalents should be included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period total amounts shown on the statement of cash flows. We adopted ASU 2016-15 and ASU 2016-18 in the first quarter of 2018 on a retrospective basis. The adoption of ASU 2016-15 has no impact on our consolidated statement of cash flows. The effect of the adoption of ASU 2016-18 on our consolidated statements of cash flows are as follows (in thousands):

Table of Contents

	For the Year Ended December 31, 2016		
	As Reported	Balances without the adoption of ASU 2016-18	Effect of adoption increase (decrease)
Consolidated Statement of Cash Flows			
Net cash provided by operating activities	$678,755	$683,506	$(4,751)
Net cash provided by investing activities	(730,589)	(730,589)	—
Net cash provided by financing activities	546,347	541,596	4,751
Net change in cash, cash equivalents and restricted cash	$494,483	$494,483	$—

	For the Year Ended December 31, 2017		
	As Reported	Balances without the adoption of ASU 2016-18	Effect of adoption increase (decrease)
Consolidated Statement of Cash Flows			
Net cash provided by operating activities	$464,246	$464,230	$ 16
Net cash provided by investing activities	(468,297)	(468,297)	—
Net cash used in financing activities	(121,698)	(137,858)	16,160
Net change in cash, cash equivalents and restricted cash	$(124,633)	$(140,809)	$ 16,176

The following table provides a reconciliation of cash, cash equivalents and restricted cash reported within our consolidated balance sheets to the total sum of these same amounts reported in our consolidated statements of cash flows:

	As of December 31, 2016	As of December 31, 2017	As of December 31, 2018
Cash and cash equivalents	$666,024	$525,215	$485,120
Restricted cash	—	16,176	22,037
Total cash, cash equivalents and restricted cash reported in the statements of cash flows	$666,024	$541,391	$507,157

Restricted cash represents legally restricted amounts being held as a compensating balance for certain outstanding letters of credit.

We adopted ASU 2016-16 in the first quarter of 2018 and the adoption resulted in approximately a $170 million benefit to accumulated deficit. See Note 14—Income Taxes. We also adopted ASU 2016-01, ASU 2017-07 and ASU 2017-09 in the first quarter of 2018. See Note 10—Investments, Note 7—Retirement Plans and Other Retiree Benefits, and Note 5—Share-Based and Other Compensation Plans, respectively.

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 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

Table of Contents

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 million to $95 million, and $110 million to $120 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.

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

Table of Contents

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.

Note 3 Share Capital

Under our Articles of Incorporation, we have an authorized share capital of $10 million, represented by 1.0 billion shares of any class with a nominal value of $0.01 per share. At December 31, 2018, there were 138.0 million common shares issued and outstanding.

In June 2018, Intelsat S.A. completed an offering of 15,498,652 common shares, nominal value 0.01 per share, at a public offering price of 14.84 per common share.

Note 4 Net Income (Loss) per Share

Basic earnings per share ("EPS") is computed by dividing net income (loss) attributable to Intelsat S.A.'s common shareholders by the weighted average number of common shares outstanding during the periods.

The following table sets forth the computation of basic and diluted net income (loss) per share attributable to Intelsat S.A.:

Table of Contents

	(in thousands, except per share data or where otherwise noted)		
	Year Ended December 31, 2016	Year Ended December 31, 2017	Year Ended December 31, 2018
Numerator:			
Net income (loss)	$ 994,112	$ (174,814)	$ (595,690)
Net income attributable to noncontrolling interest	(3,915)	(3,914)	(3,915)
Net income (loss) attributable to Intelsat S.A.	990,197	(178,728)	(599,605)
Net income (loss) attributable to common shareholders	$ 990,197	$ (178,728)	$ (599,605)
Numerator for Basic EPS—income/ (loss) available to common shareholders	$ 990,197	$ (178,728)	$ (599,605)
Numerator for Diluted EPS	$ 990,197	$ (178,728)	$ (599,605)
Denominator:			
Basic weighted average shares outstanding (in millions)	114.5	118.9	129.6
Weighted average dilutive shares outstanding (in millions):			
Preferred shares (in millions)	3.2	—	—
Employee compensation related shares including options and restricted stock units (in millions)	0.8	—	—
Diluted weighted average shares outstanding (in millions)	118.5	118.9	129.6
Basic net income (loss) per common share attributable to Intelsat S.A.	$ 8.65	$ (1.50)	$ (4.63)
Diluted net income (loss) per common share attributable to Intelsat S.A.	$ 8.36	$ (1.50)	$ (4.63)

In June 2018, Intelsat S.A. completed an offering of $402.5 million aggregate principal amount of its 4.5% Convertible Senior Notes due 2025 (the “2025 Convertible Notes”). We do not expect to settle the principal amount of the 2025 Convertible Notes in cash, and therefore use the if-converted method for calculating any potential dilutive effect of the conversion on diluted net income per share, if applicable. The 2025 Convertible Notes are eligible for conversion depending upon the trading price of our common shares and under other conditions set forth in the 2025 Indenture (as defined below in Note 12—Long Term Debt) until December 15, 2024, and thereafter without regard to any conditions. See Note 12—Long Term Debt for additional information on the conversion conditions.

Due to a net loss in the years ended December 31, 2017 and 2018, there were no dilutive securities, and therefore, basic and diluted EPS were the same. The weighted average number of shares that could potentially dilute basic EPS in the future was 6.2 million, 3.5 million and 12.5 million (consisting of restricted share units, performance units, options to purchase common shares, and potentially issuable shares from the conversion of the 2025 Convertible Notes) for the years ended December 31, 2016, 2017 and 2018, respectively.

Note 5 Share-Based and Other Compensation Plans

In May 2017, the FASB issued ASU 2017-09, Compensation-Stock Compensation (Topic 718): Scope of Modification Accounting, which is intended to clarify when to account for a change to the terms or conditions of a share-based payment award as a modification. Under ASU 2017-09 modification accounting is required only if the fair value (or calculated intrinsic value, if those amounts are being used to measure the award under ASC 718), the vesting conditions, or the classification of the award changes as a result of the change in terms or conditions. ASU 2017-09 is effective for all entities for annual periods, and interim periods within those annual periods, beginning after December 15, 2017. We adopted ASU 2017-09 on January 1, 2018. The adoption of this standard did not have an impact on our consolidated financial statements and associated disclosures. We will continue to evaluate the impact of ASU 2017-09 as any modifications occur.

In April 2013, our board of directors adopted the amended and restated Intelsat Global, Ltd. 2008 Share Incentive Plan (as amended, the “2008 Equity Plan”). Also in April 2013, our board of directors adopted the Intelsat S.A. 2013 Equity Incentive Plan (the “2013 Equity Plan”). No new awards may be granted under the 2008 Equity Plan.

The 2013 Equity Plan provides for a variety of equity based awards, including incentive stock options (within the meaning of Section 422 of the United States Internal Revenue Service Tax Code), restricted shares, restricted share units (“RSUs”), other share-based awards and performance compensation awards. Effective June 16, 2016, we increased the aggregate number of common shares authorized for issuance under the 2013 Equity Plan to 20.0 million common shares. The total aggregate number of shares available for future issuance under the 2013 Equity Plan was 7.3 million as of December 31, 2018.

Table of Contents

For all share-based awards, we recognize the compensation costs over the vesting period during which the employee provides service in exchange for the award. During the years ended December 31, 2016, 2017 and 2018, we recorded compensation expense of $23.2 million, $16.0 million, and $6.8 million, respectively. The income tax benefit related to share-based compensation expense was $0.4 million for the year ended December 31, 2018. We did not recognize any income tax benefit related to share-based compensation expense for the years ended December 31, 2017 and December 31, 2016.

Stock Options

Stock options generally expire 10 years from the date of grant. In some cases, options have been granted which expire 15 years from the date of grant. The options vest monthly over service periods ranging from six months to five years. Stock Option activity during 2018 was as follows:

	Number of Stock Options (in thousands)	Weighted Average Exercise price	Weighted Average remaining contractual term (in years)	Aggregate intrinsic value (in millions)
Outstanding at January 1, 2018	2,084	$ 3.84		
Granted	3	19.5		
Exercised	(852)	3.77		
Expired	(126)	5.67		
Outstanding at December 31, 2018	1,109	$ 3.71	5.7	$ 19.6
Exercisable at December 31, 2018	1,037	$ 3.71	5.6	$ 18.3

The total intrinsic value of stock options exercised during the years ended December 31, 2017 and 2018 was $0.2 million and $7.9 million, respectively. No stock options were exercised during the year ended December 31, 2016. As of December 31, 2018, there was a minimal amount of total unrecognized compensation cost related to unvested options, which is expected to be recognized over a weighted average period of 0.1 years.

During the years ended December 31, 2016, 2017 and 2018, we recorded compensation expense of $2.6 million, $1.4 million and $0.2 million, respectively, including compensation expense from option modifications in 2014 and 2016, further described below. During years ended 2017 and 2018, we received cash of $0.5 million and $3.2 million, respectively, from the exercise of stock options. No stock options were exercised during the year ended December 31, 2016.

Anti-Dilution Options

In connection with our initial public offering of common shares in April 2013 (the “IPO”) and upon consummation of the IPO, options were granted to certain individuals in accordance with the existing terms of their side letters to a management shareholders agreement to which we are a party, which, when taken together with the common shares received in connection with the reclassification of our outstanding former Class B Shares at the time of our IPO, preserved their ownership interests represented by their outstanding former Class B Shares immediately prior to the reclassification.

These options generally expire 10 years from the date of the grant.

	Number of Stock Options (in thousands)	Weighted Average Exercise price	Weighted Average remaining contractual term (in years)	Aggregate intrinsic value (in millions)
Outstanding at January 1, 2018	1,610	$ 11.98		
Outstanding at December 31, 2018	1,610	$ 11.98	4.1	$ 15.1
Excercisable at December 31, 2018	1,610	$ 11.98	4.1	$ 15.1

We measure the fair value of anti-dilution option grants at the date of grant using a Black-Scholes option pricing model. There were no anti-dilution options granted during the years ended December 31, 2016, 2017 and 2018. During the year ended December 31, 2016, we recorded compensation expense associated with anti-dilution option awards of $1.0 million related to 2016 option modifications further described below. No compensation expense was recorded for these awards during the years ended December 31, 2017 and 2018.

Table of Contents

There were no anti-dilution options exercised during the years ended 2016, 2017 or 2018.

2016 Option modifications

During the year ended December 31, 2016, we amended 1.2 million stock options under the 2008 Equity Plan (including 0.7 million of anti-dilution options), and 0.4 million stock options under the 2013 Equity Plan in order to modify the exercise prices to $4.16 for the anti-dilution options and to $3.77 for the remainder. As a result of the change, we estimated the difference between fair value of the amended options and the fair value of the original awards before settlement. The fair value was measured using the Black-Scholes option pricing model and the following assumptions were used for the amended options and the original awards before amendment: risk-free interest rates of 0.8% to 1.5%; dividend yields of 0.0%; expected volatility of 50-60%; and expected life of one to four years.

All such options were fully vested and we recognized additional compensation expense associated with the modifications of $2.0 million for the year ended December 31, 2016, which has been included in the respective sections above.

Time-based RSUs

Time-based RSUs vest over periods ranging from one to three years from the date of grant.

Time-based RSUs activity during 2018 was as follows:

	Number of RSUs (in thousands)	Weighted Average grant date fair value	Weighted Average remaining contractual term (in years)	Aggregate intrinsic value (in millions)
Outstanding at January 1, 2018	3,417	$ 7.56		
Granted	1,490	7.99		
Vested (1)	(2,113)	10.07		
Forfeited	(192)	5.42		
Outstanding at December 31, 2018	2,602	$ 5.93	1.6	$ 40.2

(1) The total vested RSUs includes 1,025 RSUs that were vested in prior years but settled in 2018.

The fair value of time-based RSUs is deemed to be the market price of common shares on the date of grant. The weighted average grant date fair value of time-based RSUs granted during the years ended December 31, 2016, 2017, and 2018 was $1.67, $4.36, and $7.99, respectively. The total intrinsic value of time-based RSUs vested during the years ended December 31, 2016, 2017 and 2018 was $1.7 million, $6.0 million, and $9.2 million, respectively. As of December 31, 2018, there was $10.7 million of total unrecognized compensation cost related to unvested time-based RSUs, which is expected to be recognized over a weighted average period of 1.6 years.

During the years ended December 31, 2016, 2017, and 2018, we recorded compensation expense associated with these time-based RSUs of $17.9 million, $13.7 million, and $5.7 million, respectively.

Performance-based RSUs

Performance-based RSUs vest after three years from the date of grant upon achievement of certain performance conditions. These grants are subject to vesting upon achievement of an adjusted EBITDA target or achievement of a relative shareholder return (“RSR”), which is based on the Company’s relative shareholder return percentile ranking versus the S&P 900 Index target as defined in the grant agreement.

Performance-based RSUs activity during 2018 was as follows:

Table of Contents

	Number of RSUs (in thousands)	Weighted Average grant date fair value	Weighted Average remaining contractual term (in years)	Aggregate intrinsic value (in millions)
Outstanding at January 1, 2018	2,156	$ 2.89		
Granted	930	4.53		
Cancelled	(348)	8.97		
Forfeited	(114)	2.28		
Outstanding at December 31, 2018	2,624	$ 2.69	1.1	$ 49.1

We measure the fair value of performance-based RSUs at the date of grant using the market price of our common shares.

The weighted average grant date fair value of performance-based RSUs granted during the years ended December 31, 2016, 2017, and 2018 was $0.94, $2.79, and $4.53, respectively. As of December 31, 2018, there was $2.3 million of total unrecognized compensation cost related to unvested performance-based RSUs, which is expected to be recognized over a weighted average period of 1.1 years.

Achievement of the adjusted EBITDA target for awards granted in 2016, 2017, and 2018 is not currently considered probable. No compensation cost associated with these awards (based on the adjusted EBITDA condition) was recognized during the years ended December 31, 2017, and 2018. We recorded compensation expense associated with the awards granted in 2016 (based on the adjusted EBITDA condition) of $0.1 million during the year ended December 31, 2016, which was reversed during the year ended December 31, 2017. We recorded compensation expense associated with the RSR portion of performance-based RSUs of $1.6 million, $1.0 million, and $0.9 million during the years ended December 31, 2016, 2017 and 2018, respectively.

Note 6 Fair Value Measurements

We have identified investments in marketable securities, interest rate financial derivative instruments, warrant instruments as those items that meet the criteria of the disclosure requirements and fair value framework of FASB ASC 820.

The following tables present assets measured and recorded at fair value in our consolidated balance sheets on a recurring basis and their corresponding level within the fair value hierarchy (in thousands), excluding long-term debt (see Note 12—Long-Term Debt) and pension plan assets (see Note 7—Retirement Plans and Other Retiree Benefits). No transfers between Level 1 and Level 2 fair value measurements occurred during the year ended December 31, 2018.

		Fair Value Measurements at December 31, 2017		
Description	As of December 31, 2017	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Assets				
Marketable securities[1]	$ 5,776	$5,776	$ —	$ —
Undesignated interest rate cap[2]	22,336	—	22,336	—
Warrant[3]	4,100	—	—	4,100
Total assets	$ 32,212	$5,776	$ 22,336	$ 4,100

		Fair Value Measurements at December 31, 2018		
Description	As of December 31, 2018	Quoted Prices in	Significant Other Observable Inputs	Significant Unobservable Inputs

Assets		Active Markets for Identical Assets (Level 1)	(Level 2)	(Level 3)
Marketable securities[1]	$ 4,700	$4,700	$ —	$ —
Undesignated interest rate cap[2]	33,086	—	33,086	—
Warrant[3]	4,100	—	—	4,100
Total assets	$ 41,886	$4,700	$ 33,086	$ 4,100

(1) The valuation measurement inputs of these marketable securities represent unadjusted quoted prices in active markets and, accordingly, we have classified such investments within Level 1 of the fair value hierarchy. The cost basis of our marketable securities was $4.7 million at December 31, 2017 and $4.6 million at December 31, 2018. We sold

Table of Contents

marketable securities with a cost basis of $0.7 million during the year ended December 31, 2018 and recorded a nominal gain on the sale within other income, net in our consolidated statement of operations.

(2) The valuation of our interest rate derivative instruments reflects the fair value of premiums paid, taking into account observable inputs including current interest rates, the market expectation for future interest rates volatility and current creditworthiness of the counterparties. As a result, we have determined that our derivative valuations in their entirety are classified within Level 2 of the fair value hierarchy.

(3) We valued the warrant using a valuation technique which reflects the risk free rate, time to maturity and volatility of comparable companies. We identified the inputs used to calculate the fair value as Level 3 inputs and concluded that the valuation in its entirety was classified as Level 3 within the fair value hierarchy.

Note 7 Retirement Plans and Other Retiree Benefits

In March 2017, the FASB issued ASU 2017-07, Compensation-Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost, to require that an employer report the service cost component in the same line item or items as other compensation costs arising from services rendered by the pertinent employees during the period in the operating income section of the income statement, if one is presented. The other components of net benefit cost, as defined, are required to be presented in the income statement separately from the service cost component and outside a subtotal of income from operations. If a separate line item or items are used to present the other components of net benefit cost, that line item or items must be appropriately described. If a separate line item or items are not used, the line item or items used in the income statement to present the other components of net benefit cost must be disclosed. The amendments in this ASU also allow only the service cost component to be eligible for capitalization when applicable. ASU 2017-07 is effective for interim and annual periods beginning after December 15, 2017 for public business entities. As discussed in Note 2, we adopted ASU 2017-07 on January 1, 2018 using the retrospective method, which changed the financial statement presentation of service costs and the other components of net periodic benefit cost. The service cost component, which does not apply to our plans since they are frozen, continues to be included in operating income; however, the other components are now presented in other income (expense), net in the consolidated statements of operations. 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, 2016 and 2017, to conform to the current year presentation.

The reclassifications to conform to the current year presentation are as follows (in thousands):

	Year Ended December 31, 2016	Year Ended December 31, 2017
Operating Expenses:		
Direct costs of revenue (excluding depreciation and amortization)	$ 1,487	$ 2,016
Selling, general and administrative	1,140	1,460
Other income (expense), net	$ 2,627	$ 3,476

(a) 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.

In September 2018, the Company communicated a plan to its retiree medical group Medicare eligible plan participants to transition to a private exchange, effective January 1, 2019, which was accounted for as a plan amendment. As a result of the plan amendment, we recognized a decrease of $38.5 million (net of $0.7 million in tax impact) in our other postretirement benefit obligation as of December 31, 2018, with a corresponding increase to other

comprehensive income for the year ended December 31, 2018.

In the first quarter of 2015, we amended the defined benefit retirement plan to cease the accrual of additional benefits for the remaining active participants effective March 31, 2015. As a result of the curtailment, all of the plan's participants are now considered inactive. Accordingly, all amounts recorded in accumulated other comprehensive loss are being recognized as an increase to net periodic benefit cost over the average remaining life expectancy of plan participants, which is approximately 20 years.

Table of Contents

The defined benefit retirement plan is subject to the provisions of the Employee Retirement Income Security Act of 1974, as amended. We expect that our future contributions to the defined benefit retirement plan will be based on the minimum funding requirements of the Internal Revenue Code and on the plan's funded status. 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 years. The impact on the funded status is determined based upon market conditions in effect when we completed our annual valuation. We anticipate that our contributions to the defined benefit retirement plan in 2019 will be approximately $5.1 million. We fund the postretirement medical benefits throughout the year based on benefits paid. We anticipate that our contributions to fund postretirement medical benefits in 2019 will be approximately $3.1 million.

Prior service credits and actuarial losses are reclassified from accumulated other comprehensive loss to net periodic pension benefit costs, which are included in other income (expense), net on our consolidated statements of operations for the year ended December 31, 2018. The following table presents these reclassifications, net of tax, as well as the reclassification of the realized gain on investments, and the statement of operations line items that are impacted (in thousands):

	Year Ended December 31, 2016	Year Ended December 31, 2017	Year Ended December 31, 2018
Amortization of prior service credits reclassified from other comprehensive loss to net periodic pension benefit costs included in:			
Other income (expense), net	(5)	21	(839)
Total	$ (5)	$ 21	$ (839)
Amortization of actuarial loss reclassified from other comprehensive loss to net periodic pension benefit costs included in:			
Other income (expense), net	2,223	2,074	4,064
Total	$ 2,223	$ 2,074	$ 4,064
Realized gain on investments included in:			
Other income (expense), net	$ (192)	$ (235)	$ (351)
Total	$ (192)	$ (235)	$ (351)

Reconciliation of Funded Status and Accumulated Benefit Obligation. Expenses for our defined benefit retirement plan and for postretirement medical benefits that are provided under our medical plan are developed from actuarial valuations. The following summarizes the projected benefit obligations, plan assets and funded status of the defined benefit retirement plan, as well as the projected benefit obligations of the postretirement medical benefits provided under our medical plan (in thousands, except percentages):

Table of Contents

	Year Ended December 31, 2017		Year Ended December 31, 2018	
	Pension Benefits	Other Post-retirement Benefits	Pension Benefits	Other Post-retirement Benefits
Change in benefit obligation				
Benefit obligation at beginning of year	$424,929	$82,897	$447,222	$82,587
Service cost	—	—	—	—
Interest cost	14,778	2,869	14,428	2,314
Employee contributions	—	416	—	390
Plan amendments	—	—	—	(33,907)
Benefits paid	(24,380)	(4,125)	(30,741)	(3,600)
Actuarial (gain) loss	31,895	530	(36,827)	(7,258)
Benefit obligation at end of year	$447,222	$82,587	$394,082	$40,526
Change in plan assets				
Plan assets at beginning of year	$317,510	$—	$334,582	$—
Employer contributions	2,888	3,709	5,115	3,210
Employee contributions	—	416	—	390
Actual return on plan assets	38,564	—	(11,325)	—
Benefits paid	(24,380)	(4,125)	(30,741)	(3,600)
Plan assets at fair value at end of year	$334,582	$—	$297,631	$—
Accrued benefit costs and funded status of the plans	$(112,640)	$(82,587)	$(96,451)	$(40,526)
Accumulated benefit obligation	$447,222		$394,082	
Weighted average assumptions used to determine accumulated benefit obligation and accrued benefit costs				
Discount rate	3.67%	3.64%	4.35%	4.27%
Weighted average assumptions used to determine net periodic benefit costs				
Discount rate	4.23%	4.19%	3.67%	3.64%/4.18%
Expected rate of return on plan assets	7.60%	—	7.60%	—
Rate of compensation increase	—	—	—	—
Amounts in accumulated other comprehensive loss recognized in net periodic benefit cost				
Actuarial (gain) loss, net of tax	$2,363	$(289)	$4,640	$(576)
Prior service credits, net of tax	(8)	29	(854)	15
Total	$2,355	$(260)	$3,786	$(561)
Amounts in accumulated other comprehensive loss not yet recognized in net periodic benefit cost				
Actuarial (gain) loss, net of tax	$99,152	$(8,815)	$93,509	$(15,377)
Prior service credits, net of tax	(366)	—	(343)	(32,514)
Total	$98,786	$(8,815)	$93,166	$(47,891)
Amounts in accumulated other comprehensive loss expected to be recognized in net periodic benefit cost in the subsequent year				
Actuarial (gain) loss	$(5,307)	$403	$(4,222)	$1,229
Prior service credits	—	8	—	2,544
Total	$(5,307)	$411	$(4,222)	$3,773

Our benefit obligations are determined by discounting each future year's expected benefit cash flow using the corresponding spot rates along a yield curve that is derived from the monthly bid-price data of bonds that are rated high grade by either Moody's Investor Service or Standard and Poor's Rating Services. The bond types included are noncallable bonds, private placement bonds that are traded among qualified institutional buyers and are at least two years from date of issuance, bonds with a make-whole provision, and bonds issued by foreign corporations that are denominated in U.S. dollars. Excluded are bonds that are callable, sinkable and puttable as well as those for which the quoted yield-to-maturity is zero. Using the bonds from this universe that have a yield higher than the regression mean yield curve for the full universe, regression analysis is used to determine the best-fitting curve, which gives a good fit to the data at both long and short maturities. The resulting regressed coupon yield curve is smoothed continuously along its entire length and represents an unbiased average of the observed market data.

Table of Contents

In the first quarter of 2016, we changed the method we use to estimate the interest cost component of net periodic benefit cost for our defined benefit pension and other postretirement benefit plans. Historically, we estimated the interest cost component using a single weighted-average discount rate derived from the yield curve used to measure the benefit obligation at the beginning of the year. We elected to use a full yield curve approach in the estimation of this component of benefit cost by applying the specific spot rates along the yield curve used in the determination of the benefit obligation to the relevant projected cash flows. We made this change to improve the correlation between projected benefit cash flows and the corresponding yield curve spot rates, and to provide a more precise measurement of interest costs. This change does not affect the measurement of our total benefit obligations, as the change in the interest cost is completely offset in the actuarial (gain) loss reported. We accounted for this change as a change in estimate and, accordingly, accounted for it prospectively starting in the first quarter of 2016. The discount rate that we used to measure interest cost as of December 31, 2016 was approximately 3.8%. The discount rate that we measured at December 31, 2016 and would have used for interest cost under our prior estimation technique was approximately 4.5%. The reduction in interest cost as of December 31, 2016, associated with this change in estimate was approximately $3.6 million. The discount rate that we used to measure interest cost was approximately 3.6% and 3.3% as of December 31, 2017 and 2018, respectively.

Interest rates used in these valuations are key assumptions, including discount rates used in determining the present value of future benefit payments and expected return on plan assets, which 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 in 2014, and modified those tables in 2015, 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. Our pension plan assets are managed in accordance with an investment policy adopted by the pension committee, as discussed below.

Plan Assets. The investment policy of the Plan includes target allocation percentages of approximately 49% for investments in equity securities (29% U.S. equities and 20% non-U.S. equities), 36% for investments in fixed income securities and 15% for investments in other securities, which is broken down further into 5% for investments in hedge fund of funds and 10% for investments in real estate fund of funds. Plan assets include investments in both U.S. and non-U.S. equity funds. Fixed income investments include a long duration bond fund, a high yield bond fund and an emerging markets debt fund. The funds in which the plan's assets are invested are institutionally managed and have diversified exposures into multiple asset classes implemented with over 63 investment managers. The guidelines and objectives of the funds are congruent with the Intelsat investment policy statement.

The target and actual asset allocation of our pension plan assets were as follows:

	As of December 31, 2017		As of December 31, 2018	
	Target Allocation	Actual Allocation	Target Allocation	Actual Allocation
Asset Category				
Equity securities	49 %	50 %	49 %	45 %
Debt securities	36 %	35 %	36 %	36 %
Other securities	15 %	15 %	15 %	19 %
Total	100 %	100 %	100 %	100 %

The fair values of our pension plan assets by asset category are as follows (in thousands):

Table of Contents

	Fair Value Measurements at December 31, 2018	Level 1	Level 2	Level 3
Asset Category				
Equity Securities				
U.S. Large-Cap (1)	$ 62,243	$62,243	$ —	$ —
U.S. Small/Mid-Cap (2)	15,739	15,739	—	—
World Equity Ex-US (3)	54,994	54,994	—	—
Fixed Income Securities				
Long Duration Bonds (4)	91,278	91,278	—	—
High Yield Bonds (5)	8,440	8,440	—	—
Emerging Market Fixed income (Non-US) (6)	8,923	8,923	—	—
Other Securities		$241,617	$ —	$ —
Hedge Funds (7)	18,062			
Core Property Fund (8)	37,559			
Cash and income earned but not yet received	393			
Total	$ 297,631			

	Fair Value Measurements at December 31, 2017	Level 1	Level 2	Level 3
Asset Category				
Equity Securities				
U.S. Large-Cap (1)	$ 78,076	$78,076	$ —	$ —
U.S. Small/Mid-Cap (2)	19,952	19,952	—	—
World Equity Ex-US (3)	67,835	67,835	—	—
Fixed Income Securities				
Short Duration Bonds (4)	98,421	98,421	—	—
High Yield Bonds (5)	9,419	9,419	—	—
Emerging Market Fixed income (Non-US) (6)	9,127	9,127	—	—
Other Securities		$282,830	$ —	$ —
Hedge Funds (7)	17,121			
Core Property Fund (8)	34,486			
Income earned but not yet received	145			
Total	$ 334,582			

(1) US large cap equity fund invests primarily in a portfolio of common stocks included in the S&P 500 Index, as well as other equity securities and derivative instruments whose value is derived from the performance of the S&P 500.

(2) The US small/mid cap equity includes the U.S. Small/Mid Cap Equity Fund and the Extended Market Index Fund. The U.S. Small/Mid Cap Equity Fund will invest primarily in U.S. small- and mid-cap stocks with market capitalization ranges similar to those found in the FTSE Russell 2500 Index. The Extended Markets Index Fund aims to produce investment results that correspond to the performance of the FTSE/Russell Small Cap Completeness Index.

(3) World equity ex-US fund invests primarily in common stocks and other equity securities whose issuers comprise a broad range of capitalizations and are located outside of the U.S. The fund invests primarily in developed countries but may also invest in emerging markets.

(4) The Long Duration Bond Fund will invest primarily in long-duration government and corporate fixed income securities and use derivative instruments (including interest rate swaps and Treasury futures contracts) for the purpose of managing the overall duration and yield curve exposure of the Fund's portfolio. Short duration bond fund includes the Opportunistic Income fund and the Limited Duration Bond Fund.

(5) High yield bond fund seeks to maximize return by investing primarily in a diversified portfolio of higher yielding, lower rated fixed income securities. The fund will invest primarily in securities rated below investment grade, including corporate bonds, convertible and preferred securities and zero coupon obligations.

(6) Emerging markets debt fund seeks to maximize return investing in fixed income securities of emerging markets issuers. The fund will invest primarily in U.S. dollar denominated debt securities of government, government-related and corporate issuers in emerging market countries, as well as entities organized to restructure the outstanding debt of such issuers.

Table of Contents

(7) Hedge fund seeks to provide returns that are different from (less correlated with) investments in more traditional asset classes. The fund will pursue its investment objective by investing substantially all of its assets in various hedge funds. The fund has semi-annual redemptions in June and December with a 95 days pre-notification period, and a two year lock-up on all purchases which have expired.

(8) Core property fund is a fund of funds that invests in direct commercial property funds primarily in the U.S. The fund is meant to provide current income-oriented returns, diversification, and modest inflation protection to an overall investment portfolio. Total returns are expected to be somewhere between stocks and bonds, with moderate volatility and low correlation to public markets. The fund has quarterly redemptions with a 95 days pre-notification period, and no lock-up period.

Our plan assets are measured at fair value. FASB ASC 820 prioritizes the inputs used in valuation techniques including Level 1, Level 2 and Level 3 (see Note 2 (d)—Significant Accounting Policies—Fair Value Measurements). The majority of our plan assets are valued using measurement inputs which include unadjusted prices in active markets and we have therefore classified these assets within Level 1 of the fair value hierarchy. Our other securities include Hedge Funds and Core Property Funds, which are measured at fair value using the net asset value per share practical expedient, and are not classified in the fair value hierarchy.

Net periodic pension benefit costs included the following components (in thousands):

	Year Ended December 31, 2016	Year Ended December 31, 2017	Year Ended December 31, 2018
Interest cost	$ 16,183	$ 14,778	$ 14,428
Expected return on plan assets	(25,535)	(24,410)	(24,482)
Amortization of unrecognized net loss	3,370	3,751	5,307
Total benefit	$ (5,982)	$ (5,881)	$ (4,747)

We had accrued benefit costs at December 31, 2017 and 2018 of $112.6 million and $96.4 million, respectively, related to the pension benefits, of which $0.6 million for each year were recorded within other current liabilities, and $112.0 million and $95.8 million were recorded in other long-term liabilities, respectively.

Net periodic other postretirement benefit costs included the following components (in thousands):

	Year Ended December 31, 2016	Year Ended December 31, 2017	Year Ended December 31, 2018
Interest cost	$ 3,363	$ 2,869	$ 2,314
Amortization of prior service cost	—	(8)	(854)
Amortization of unrecognized net (gain) loss	(8)	(455)	(630)
Total costs	$ 3,355	$ 2,406	$ 830

We had accrued benefit costs at December 31, 2017 and 2018 related to the other postretirement benefits of $82.6 million and $40.5 million, respectively, of which $4.1 million and $3.1 million were recorded in other current liabilities, and $78.5 million and $37.4 million were recorded in other long-term liabilities, respectively.

Depending on our actual future health care claims, our actual costs may vary significantly from those projected above. As of December 31, 2017 and December 31, 2018, the assumed health care cost trend rates prior to Medicare were 6.6% and 6.3%, respectively. These rates are expected to decrease annually to an ultimate rate of 4.5% by December 31, 2038. Increasing the assumed health care cost trend rate by 1% each year would increase the other postretirement benefits obligation as of December 31, 2018 by $3.8 million. Decreasing this trend rate by 1% each year would reduce the other postretirement benefits obligation as of December 31, 2018 by $3.2 million. A 1% increase in the assumed health care cost trend rate would have increased the net periodic other postretirement benefits cost by $0.2 million and a 1% decrease would have decreased the cost by $0.2 million for 2018.

The benefits expected to be paid in each of the next five years and in the aggregate for the five years thereafter are as follows (in thousands):

Table of Contents

	Pension Benefits	Other Post-retirement Benefits
2019	$37,034	$ 3,107
2020	28,141	3,129
2021	27,013	3,132
2022	27,021	3,129
2023	27,082	3,087
2024 to 2028	127,278	14,231
Total	$273,569	$ 29,815

(b) Other Retirement Plans

We maintain a defined contribution retirement plan, qualified under the provisions of Section 401(k) of the Internal Revenue Code, for our employees in the United States. We recognized compensation expense for this plan of $10.3 million, $7.8 million and $7.9 million for the years ended December 31, 2016, 2017 and 2018, respectively. We also maintain other defined contribution retirement plans in several non-U.S. jurisdictions, but such plans are not material to our financial position or results of operations.

Note 8 Receivables

Receivables were comprised of the following (in thousands):

	As of December 31, 2017	As of December 31, 2018
Service charges:		
Billed	$ 234,724	$ 292,634
Unbilled	11,025	—
Other	5,143	7,301
Allowance for doubtful accounts	(29,669)	(28,542)
Total	$ 221,223	$ 271,393

As a result of the adoption of ASC 606, the total receivables balance as of December 31, 2018 does not reflect unbilled service charges, which are now presented as part of the contract assets on the balance sheet. Unbilled service charges as of December 31, 2017 represent amounts earned and accrued as receivables from customers for services rendered prior to the end of the reporting period.

Note 9 Satellites and Other Property and Equipment

(a) Satellites and Other Property and Equipment, net

Satellites and other property and equipment, net were comprised of the following (in thousands):

	As of December 31, 2017	As of December 31, 2018
Satellites and launch vehicles	$10,653,213	$10,786,802
Information systems and ground segment	808,203	894,796
Buildings and other	264,417	273,155
Total cost	11,725,833	11,954,753
Less: accumulated depreciation	(5,802,214)	(6,443,051)
Total	$5,923,619	$5,511,702

Satellites and other property and equipment are stated at historical cost, with the exception of satellites that have been impaired. Satellites and other property and equipment acquired as part of an acquisition are based on their fair value at the date of acquisition.

Satellites and other property and equipment, net as of December 31, 2017 and 2018 included construction-in-progress of $705.8 million and $371.3 million, respectively. These amounts relate primarily to satellites under construction and related launch services. Interest costs of $60.0 million and $30.2 million were capitalized during the years ended December 31, 2017

Table of Contents

and 2018, respectively. Additionally, we recorded depreciation expense of $646.4 million, $665.6 million and $649.1 million during the years ended December 31, 2016, 2017 and 2018, respectively.

We have entered into launch contracts for the launch of both specified and unspecified future satellites. Each of these launch contracts provides that such contract may be terminated at our option, subject to payment of a termination fee that increases as the applicable launch date approaches. In addition, in the event of a failure of any launch, we may exercise our right to obtain a replacement launch within a specified period following our request for re-launch.

(b) Recent Satellite Launches

Horizons 3e, a satellite owned by a joint venture between the Company and JSAT International, Inc. ("JSAT"), was successfully launched on September 25, 2018 and will complete the Intelsat Epic^{NG} constellation. Horizons 3e will bring high-throughput satellite ("HTS") solutions in both C- and Ku-bands to broadband, mobility and government customers in the Asia-Pacific Ocean region from its orbital slot at 169ºE. Horizons 3e is the first Intelsat Epic^{NG} satellite to feature a multiport amplifier that enables power portability across all Ku-band spot beams. This enhanced, advanced digital payload features full beam interconnectivity in three commercial bands and significant upgrades to power, efficiency and coverage flexibility. Horizons 3e entered into service in January 2019.

Intelsat 38, a customized Ku-band payload positioned on a third-party satellite, was successfully launched on September 25, 2018. Intelsat 38 will replace Intelsat 12 at the 45ºE location and host direct-to-home ("DTH") platforms for Central and Eastern Europe as well as the Asia-Pacific region. The satellite will also provide connectivity for corporate networks and government applications in Africa. Intelsat 38 entered into service in January 2019.

Intelsat 37e, the fifth satellite in the Intelsat Epic^{NG} fleet, was successfully launched on September 29, 2017. The all-digital Intelsat 37e is the first high-throughput (“HTS”) satellite to offer full, high-resolution interconnectivity between C-, Ku- and Ka- bands, delivering additional services and improved throughput to support enterprise, broadband, government and mobility applications in the Americas, Africa and Europe. Intelsat 37e entered into service in March 2018.

On July 5, 2017, we successfully launched our Intelsat 35e satellite into orbit. The fourth of our Intelsat Epic^{NG} next-generation HTS satellites, Intelsat 35e will deliver high-performance services in the C- and Ku-bands. The Intelsat 35e Ku-band services include a customized high power wide beam for direct-to-home (“DTH”) service delivery in the Caribbean, as well as services for mobility and government applications in the Caribbean, trans-Europe to Africa and the African continent. Intelsat 35e entered into service in August 2017.

Intelsat 32e, a customized payload positioned on a third-party satellite, was successfully launched on February 14, 2017. Intelsat 32e is the third of six in our planned Intelsat Epic^{NG} fleet, featuring high-performance spot beams. Intelsat 32e increases our service capabilities over the in-demand North Atlantic and Caribbean regions, supplying services for applications such as in-flight connectivity for commercial flights and passenger and commercial broadband for cruise lines and shipping vessels. Intelsat 32e entered into service in March 2017.

(c) Satellite Health

Our satellite fleet is diversified by manufacturer and satellite type, and as a result, our fleet is generally healthy. 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

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 was established to determine the cause of the primary thruster failure and a separate team to investigate the fuel

Table of Contents

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.

Note 10 Investments

In January 2016, the FASB issued ASU 2016-01, Financial Instruments – Overall (Topic 825), to require equity investments (except those accounted for under the equity method of accounting or those that result in consolidation of the investee) to be measured at fair value with changes in fair value recognized in net income. An entity may choose to measure equity investments that do not have readily determinable fair values at cost minus impairment, if any, plus or minus changes resulting from observable price changes in orderly transactions for the identical or a similar investment of the same issuer (the measurement alternative). In February 2018, the FASB issued ASU 2018-03, Technical Corrections and Improvements to Financial Instruments Overall (Subtopic 825-10) to clarify certain aspects of the guidance issued in ASU 2016-01 that was effective for interim and annual periods beginning after December 15, 2017, including clarification that ASU 2016-01 related to equity investments without readily determinable fair values (including disclosure requirements) should be applied prospectively to equity investments that exist as of the date of adoption. We adopted the standards in the first quarter of 2018 and have elected the measurement alternative. We considered available information for any observable orderly transactions for identical or similar investments and did not make any upward or downward adjustments to our investments. The adoption of the standards did not have a material impact on our consolidated financial statements and associated disclosures.

We have ownership interests in two entities that meet the criteria of a VIE: Horizons Satellite Holdings, LLC (“Horizons Holdings”) and Horizons-3 Satellite LLC (“Horizons 3”), which are discussed in further detail below, including our analyses of the primary beneficiary determination as required under FASB ASC Topic 810, Consolidation (“FASB ASC 810”). We also own noncontrolling investments recognized under the measurement alternative, discussed further below.

(a) Horizons Holdings

Our first joint venture with JSAT is named Horizons Satellite Holdings, LLC, and consists of two investments: Horizons-1 Satellite LLC (“Horizons-1”) and Horizons-2 Satellite LLC (“Horizons-2”). Horizons Holdings borrowed from JSAT a portion of the funds necessary to finance the construction of the Horizons 2 satellite pursuant to a loan agreement. The borrowing was subsequently repaid. We provide certain services to the joint venture and in return utilize capacity from the joint venture.

We have determined that this joint venture meets the criteria of a VIE under FASB ASC 810, and we have concluded that we are the primary beneficiary because decisions relating to any future relocation of the Horizons 2 satellite, the most significant asset of the joint venture, are effectively controlled by us. In accordance with FASB ASC 810, as the primary beneficiary, we consolidate Horizons Holdings within our consolidated financial statements. Total assets of Horizons Holdings were $38.7 million and $28.8 million as of December 31, 2017 and 2018, respectively. Total liabilities at both dates were nominal.

We have a revenue sharing agreement with JSAT related to services sold on the Horizons 1 and Horizons 2 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. Amounts payable to JSAT related to the revenue sharing agreement, net of applicable fees and commissions, from the Horizons 1 and Horizons 2 satellites were $5.4 million and $5.5 million as of December 31, 2017 and 2018, respectively.

(b) Horizons-3 Satellite LLC

On November 4, 2015, we entered into a new joint venture agreement with JSAT. The joint venture, named Horizons 3, was formed for the purpose of developing, launching, managing, operating and owning a high-performance satellite located at the 169ºE orbital location.

Horizons 3, which is 50% owned by each of Intelsat and JSAT, was set up with a joint share of management authority and equal rights to profits and revenues from the joint venture. Similar to Horizons Holdings, we have a revenue

sharing agreement with JSAT related to services sold on the Horizons 3 satellite. In addition, we are responsible for billing and collection for such services, and we remit 50% of the revenue, less applicable fees and commissions, to JSAT.

We have determined that this joint venture meets the criteria of a VIE under FASB ASC 810, however we have concluded that we are not the primary beneficiary and therefore do not consolidate Horizons 3. The assessment considered both quantitative and qualitative factors, including an analysis of voting power and other means of control of the joint venture as

Table of Contents

well as each owner's exposure to risk of loss or gain. Because we and JSAT equally share control over the operations of the joint venture and also equally share exposure to risk of losses or gains, we concluded that we are not the primary beneficiary of Horizons 3. Our investment, included within other assets in our consolidated balance sheets, is accounted for using the equity method of accounting. The investment balance was $61.8 million and $109.9 million as of December 31, 2017 and 2018, respectively.

In connection with our investment in Horizons 3, we entered into a capital contribution and subscription agreement which requires us to fund our 50% share of the amounts due in order to maintain our respective 50% interest in the joint venture. Pursuant to this agreement, we made contributions of $27.4 million and $41.2 million during the years ended December 31, 2017 and 2018, respectively. In addition, our indirect subsidiary that holds our investment in Horizons 3 has entered into a security and pledge agreement with Horizons 3, pursuant to which it has granted a security interest in its membership interests in Horizons 3. Further, our indirect subsidiary has granted a security interest to Horizons 3 in its customer capacity contracts and its ownership interest in its wholly-owned subsidiary that will hold the U.S. Federal Communications Commission license required for the joint venture's operations.

(c) Investments Without Readily Determinable Fair Values

Our investments without readily determinable fair values recorded in other assets in our consolidated balance sheets had a total carrying value of $54.7 million and $73.7 million, consisting of five and six separate noncontrolling investments as of December 31, 2017 and 2018, respectively.

(d) Equity Attributable to Intelsat S.A. and Non-controlling Interests

The following tables present changes in equity attributable to the Company and equity attributable to our noncontrolling interests, which is included in the equity section of our consolidated balance sheet (in thousands):

	Intelsat S.A. Shareholders' Deficit	Noncontrolling Interests	Total Shareholders' Deficit
Balance at January 1, 2017	$ (3,634,145)	$ 24,147	$ (3,609,998)
Net income (loss)	(178,728)	3,914	(174,814)
Dividends paid to noncontrolling interests	—	(8,755)	(8,755)
Share-based compensation	16,472	—	16,472
Postretirement/pension liability adjustment	(11,801)	—	(11,801)
Other comprehensive income	332	—	332
Balance at December 31, 2017	$ (3,807,870)	$ 19,306	$ (3,788,564)

	Intelsat S.A. Shareholders' Deficit	Noncontrolling Interests	Total Shareholders' Deficit
Balance at January 1, 2018	$ (3,807,870)	$ 19,306	$ (3,788,564)
Net income (loss)	(599,605)	3,915	(595,690)
Dividends paid to noncontrolling interests	—	(8,825)	(8,825)
Common shares and 2025 Convertible Notes offering	368,253	—	368,253
Share-based compensation	10,035	—	10,035
Postretirement/pension liability adjustment	44,695	—	44,695
Other comprehensive loss	(351)	—	(351)
Adoption of accounting standards[1]	(112,162)	—	(112,162)
Balance at December 31, 2018	$ (4,097,005)	$ 14,396	$ (4,082,609)

(1) See Note 2—Significant Accounting Policies and Note 14—Income Taxes

Table of Contents

Note 11 Goodwill and Other Intangible Assets

The carrying amounts of goodwill and acquired intangible assets not subject to amortization consist of the following (in thousands):

	As of December 31, 2017	As of December 31, 2018
Goodwill (1)	$ 2,620,627	$ 2,620,627
Orbital locations	2,387,700	2,387,700
Trade name	65,200	65,200

(1) Net of accumulated impairment losses of $4,160,200.

We account for goodwill and other non-amortizable intangible assets in accordance with FASB ASC 350, and have deemed these assets to have indefinite lives. Therefore, these assets are not amortized but are instead tested on an annual basis for impairment during the fourth quarter, or whenever events or changes in circumstances indicate that the carrying amount may not be fully recoverable.

(a) Goodwill

We perform our annual goodwill impairment assessment using a qualitative approach to identify and consider the significance of relevant key factors, events, and circumstances that affect the fair value of our reporting unit. We are required to identify reporting units at a level below the Company's identified operating segments for impairment analysis. We have identified only one reporting unit for the goodwill impairment test.

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.

Based on our review at December 31, 2017, since the fixed and mobile satellite services industry is under pressure (pricing, over-supply, value-chain inefficiencies) and since comparable companies have demonstrated negative to minimal revenue growth with equities underperforming, we determined that a quantitative assessment of goodwill was appropriate.

We determined the estimated fair value of our reporting unit using discounted cash flow analysis, along with independent source data related to the comparative market multiples and, when available, recent transactions, each of which is considered a Level 3 input within the fair value hierarchy under FASB ASC 820. The discounted cash flows were derived from a five-year projection of cash flows plus a residual value, with the resulting projected cash flows discounted at an appropriate weighted average cost of capital.

In estimating the undiscounted cash flows, we primarily used our internally prepared budgets and forecast information. The key assumptions included in our model were projected growth rates, cost of capital, effective tax rates, and industry and economic trends. A change in the estimated future cash flows or other assumptions could change our estimated fair values and result in future impairments. Based on our quantitative analysis as described above, we concluded that there was no impairment for goodwill at December 31, 2017.

Based on our examination of the qualitative factors 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.

(b) Orbital Locations, Trade Name and other Intangible Assets

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.

Table of Contents

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.

The carrying amount and accumulated amortization of acquired intangible assets subject to amortization consisted of the following (in thousands):

	As of December 31, 2017			As of December 31, 2018		
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Backlog and other	$743,760	$(686,425)	$57,335	$743,760	$(701,445)	$42,315
Customer relationships	534,030	(241,781)	292,249	534,030	(265,242)	268,788
Total	$1,277,790	$(928,206)	$349,584	$1,277,790	$(966,687)	$311,103

Intangible assets are amortized based on the expected pattern of consumption. We recorded amortization expense of $48.5 million, $42.3 million and $38.5 million for the years ended December 31, 2016, 2017 and 2018, respectively. Scheduled amortization charges for the intangible assets over the next five years are as follows (in thousands):

Year	Amount
2019	$34,351
2020	31,103
2021	28,635
2022	25,479
2023	21,353

Our policy is to expense all costs incurred to renew or extend the terms of our intangible assets. The renewal expenses for the years ended December 31, 2016, 2017 and 2018 were immaterial to our consolidated results of operations.

Note 12 Long-Term Debt

The carrying values and fair values of our notes payable and long-term debt were as follows (in thousands):

	As of December 31, 2017		As of December 31, 2018	
	Carrying Value	Fair Value	Carrying Value	Fair Value
Intelsat S.A.:				
4.5% Convertible Senior Notes due June 2025	$—	$—	$402,500	$590,427
Unamortized prepaid debt issuance costs and discount on 4.5% Convertible Senior Notes	—	—	(149,083)	—
Total Intelsat S.A. obligations	—	—	253,417	590,427
Intelsat Luxembourg:				
6.75% Senior Notes due June 2018	$96,650	$94,717	$—	$—
Unamortized prepaid debt issuance costs on 6.75% Senior Notes	(78)	—	—	—
7.75% Senior Notes due June 2021	2,000,000	1,070,000	421,219	381,203

Unamortized prepaid debt issuance costs on 7.75% Senior Notes	(13,325)	—	(2,062)	—
8.125% Senior Notes due June 2023	1,000,000	515,000	1,000,000	765,000
Unamortized prepaid debt issuance costs on 8.125% Senior Notes	(8,562)	—	(7,256)	—
12.5% Senior Notes due November 2024	403,350	265,052	403,350	376,807

Table of Contents

Unamortized prepaid debt issuance costs and discount on 12.5% Senior Notes	(209,165)	—	(198,620)	—
Total Intelsat Luxembourg obligations	3,268,870	1,944,769	1,616,631	1,523,010
Intelsat Connect Finance:				
12.5% Senior Notes due April 2022	$731,892	$640,406	$—	$—
Unamortized prepaid debt issuance costs and discount on 12.5% Senior Notes	(267,108)	—	—	—
9.5% Senior Notes due February 2023	—	—	1,250,000	1,062,500
Unamortized prepaid debt issuance costs and discount on 9.5% Senior Notes	—	—	(34,904)	—
Total Intelsat Connect Finance obligations	464,784	640,406	1,215,096	1,062,500
Intelsat Jackson:				
9.5% Senior Secured Notes due September 2022	$490,000	$565,950	$490,000	$556,150
Unamortized prepaid debt issuance costs and discount on 9.5% Senior Secured Notes	(17,556)	—	(14,545)	—
8% Senior Secured Notes due February 2024	1,349,678	1,423,910	1,349,678	1,390,168
Unamortized prepaid debt issuance costs and premium on 8.0% Senior Secured Notes	(5,378)	—	(4,671)	—
7.25% Senior Notes due October 2020	2,200,000	2,068,000	—	—
Unamortized prepaid debt issuance costs and premium on 7.25% Senior Notes	(5,151)	—	—	—
7.5% Senior Notes due April 2021	1,150,000	1,040,750	—	—
Unamortized prepaid debt issuance costs on 7.5% Senior Notes	(5,415)	—	—	—
5.5% Senior Notes due August 2023	2,000,000	1,630,000	1,985,000	1,717,025
Unamortized prepaid debt issuance costs on 5.5% Senior Notes	(12,977)	—	(10,859)	—
9.75% Senior Notes due July 2025	1,500,000	1,455,000	1,485,000	1,488,713
Unamortized prepaid debt issuance costs on 9.75% Senior Notes	(20,315)	—	(18,230)	—
8.5% Senior Notes due October 2024	—	—	2,950,000	2,832,000
Unamortized prepaid debt issuance costs and premium on 8.5% Senior Notes	—	—	(15,310)	—
Senior Secured Credit Facilities due June 2019	1,095,000	1,093,631	—	—
Unamortized prepaid debt issuance costs and discount on Senior Secured Credit Facilities	(4,636)	—	—	—
Senior Secured Credit Facilities due November 2023	2,000,000	1,947,500	2,000,000	1,940,000
Unamortized prepaid debt issuance costs and discount on Senior Secured Credit Facilities	(28,600)	—	(26,965)	—
Senior Secured Credit Facilities due January 2024	—	—	395,000	395,988
Unamortized prepaid debt issuance costs and discount on Senior Secured Credit Facilities	—	—	(1,933)	—
6.625% Senior Secured Credit Facilities due January 2024	—	—	700,000	694,750
Unamortized prepaid debt issuance costs and discount on Senior Secured Credit Facilities	—	—	(3,427)	—
Total Intelsat Jackson obligations	11,684,650	11,224,741	11,258,738	11,014,794
Eliminations:				
7.75% Senior Notes of Intelsat Luxembourg due June 2021 owned by Intelsat Connect Finance	$(979,168)	$(523,855)	$—	$—
Unamortized prepaid debt issuance costs on 7.75% Senior Notes	6,524	—	—	—

8.125% Senior Notes of Intelsat Luxembourg due June 2023 owned by Intelsat Connect Finance and Intelsat Jackson	(111,663)	(57,506)	(111,663)	(85,422)
Unamortized prepaid debt issuance costs on 8.125% Senior Notes	956	—	810	—
12.5% Senior Notes of Intelsat Luxembourg due November 2024 owned by Intelsat Connect Finance, Intelsat Jackson, and Intelsat Envision	(402,595)	(264,556)	(403,245)	(376,708)
Unamortized prepaid debt issuance costs and discount on 12.5% Senior Notes	208,775	—	198,568	—
Unamortized prepaid debt issuance costs and discount on 12.5% Senior Notes due 2022	67,525	—	—	—

Table of Contents

Total eliminations:	(1,209,646)	(845,917)	(315,530)	(462,130)
Total Intelsat S.A. long-term debt	$14,208,658	$12,963,999	$14,028,352	$13,728,601
Less:				
Current portion of long-term debt	96,572		—	
Total long-term debt, excluding current portion	$14,112,086		$14,028,352	

The fair value for publicly traded instruments is determined using quoted market prices, and for non-publicly traded instruments, fair value is based upon composite pricing from a variety of sources, including market leading data providers, market makers and leading brokerage firms. Substantially all of the inputs used to determine the fair value of our debt are classified as Level 1 inputs within the fair value hierarchy from FASB ASC 820, except our senior secured credit facilities, the inputs for which are classified as Level 2.

Required principal repayments of long-term debt over the next five years and thereafter as of December 31, 2018 are as follows (in thousands):

Year	Amount
2019	$—
2020	—
2021	421,219
2022	490,000
2023	6,123,337
2024 and thereafter	7,282,283
Total principal repayments	14,316,839
Unamortized discounts, premiums and prepaid issuance costs	(288,487)
Total Intelsat S.A. long-term debt	$14,028,352

2018 Debt and Other Capital Markets Transactions

March 2018/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 the 2025 Convertible Notes. These notes are guaranteed by a direct subsidiary of Intelsat Luxembourg, 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. In connection with the repurchase of the 2021 Luxembourg Notes, we recognized a net gain on early extinguishment of debt of $22.1 million consisting of the difference between the carrying value of debt repurchased and the total cash amount paid (including related fees and expenses), together with a write-off of unamortized debt issuance costs. 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.

The 2025 Convertible Notes mature on June 15, 2025 unless earlier repurchased, converted or redeemed, as set forth in the indenture governing the 2025 Convertible Notes (the “2025 Indenture”). Holders may elect to convert their notes depending upon the trading price of our common shares and under other conditions set forth in the 2025 Indenture until December 15, 2024, and thereafter without regard to any conditions. The initial conversion rate is 55.0085

common shares per $1,000 principal amount of notes, which is equivalent to an initial conversion price of approximately $18.18 per common share, subject to customary adjustments, and will be increased upon the occurrence of specified events set forth in the 2025 Indenture. We may redeem the 2025 Convertible Notes at our option, on or after June 15, 2022, and prior to the forty-second scheduled

Table of Contents

trading day preceding the maturity date, in whole or in part, depending upon the trading price of our common shares as set forth in the optional redemption provisions in the 2025 Indenture or in the event of certain developments affecting taxation with respect to the 2025 Convertible Notes. Based on the closing price of our common shares of $21.39 on December 31, 2018, the if-converted value of the 2025 Convertible Notes was greater than the aggregate principal amount. However, the 2025 Convertible Notes are not currently convertible based on the conditions set forth in the 2025 Indenture.

In accounting for the transaction, the 2025 Convertible Notes were separated into liability and equity components. The carrying amount of the liability component was calculated by measuring the fair value of a similar debt instrument that does not have an associated convertible feature. The carrying amount of the equity component is $149.4 million, which is also recognized as a discount on the 2025 Convertible Notes and represents the value assigned to the conversion option which was determined by deducting the fair value of the liability component from the par value of the 2025 Convertible Notes. The $149.4 million equity component is included in additional paid-in capital on our consolidated balance sheet as of June 30, 2018 and will not be remeasured as long as it continues to meet the conditions for equity classification. The excess of the principal amount of the liability component over its carrying amount was recorded as a discount on the 2025 Convertible Notes and will be amortized to interest expense over the contractual term of the 2025 Convertible Notes at an effective interest rate of 13.0%.

We incurred debt issuance costs of $12.7 million related to the 2025 Convertible Notes, which were allocated to the liability and equity components based on their relative values. Issuance costs attributable to the liability component were $7.3 million and will be amortized to interest expense using the effective interest method over the contractual term of the 2025 Convertible Notes. Issuance costs attributable to the equity component were netted against the equity component in additional paid-in capital.

Interest expense for the year ended December 31, 2018 related to the 2025 Convertible Notes was as follows (in thousands):

	Year Ended December 31, 2018
Coupon interest	$ 9,710
Amortization of discount and prepaid debt issuance costs	7,654
Total interest expense	$ 17,364

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 its 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 of 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. 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. In connection with these transactions, we recognized a loss on extinguishment of debt of $188.2 million, consisting of the difference between the carrying value of the debt and the total cash amount paid (including related fees and expenses), together with a write-off of unamortized debt issuance costs and unamortized discount or premium, if applicable.

September 2018 Intelsat Jackson Senior Notes Offering and Tender Offer

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 all remaining outstanding 2020 Jackson Notes. The remaining net proceeds from the 2024 Jackson Senior Unsecured Notes offering were used to repurchase and redeem $195.3 million aggregate principal amount of Intelsat Jackson's 7.5% Senior Notes due 2021 (the "2021 Jackson Notes") as of September 30, 2018, $246.0 million additional aggregate principal amount of 2021 Jackson Notes in October 2018, and to pay related fees and expenses. In connection with the repurchase and redemption, we recognized a loss on extinguishment of debt of $15.9 million, consisting of the difference between the carrying value of the debt and the total cash amount paid (including related fees and expenses), together with a write-off of unamortized debt issuance costs and unamortized premium, if applicable.

Table of Contents

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 $700.0 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 of 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. In connection with the repurchase, we recognized a loss on extinguishment of debt of $17.8 million, consisting of the difference between the carrying value of the debt and the total cash amount paid (including related fees and expenses), together with a write-off of unamortized debt issuance costs.
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 12.5% 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 a previous debt exchange, 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 Amendments to Intelsat Jackson Senior Secured Credit Facility
In November and December 2017, Intelsat Jackson entered into amendments of the Intelsat Jackson Secured Credit Agreement. See—Description of Indebtedness—Intelsat Jackson—Intelsat Jackson Senior Secured Credit Agreement, below.
Description of Indebtedness
(a) Intelsat S.A.
4 ½% Convertible Senior Notes due 2025
In June 2018, we completed an offering of $402.5 million aggregate principal amount of the 2025 Convertible Notes. See—2018 Debt and Other Capital Markets Transactions—June 2018 Intelsat S.A. Senior Convertible Notes Offering and Common Shares Offering, above.
(b) Intelsat Luxembourg
7 ¾% Senior Notes due 2021
Intelsat Luxembourg had $421.2 million in aggregate principal amount of the 2021 Luxembourg Notes outstanding at December 31, 2018. The 2021 Luxembourg Notes bear interest at 7 ¾% annually and mature in June 2021. The 2021 Luxembourg Notes are guaranteed by Intelsat S.A., Intelsat Investment Holdings S.à r.l., Intelsat Holdings S.A. and Intelsat Investments S.A. (the "Parent Guarantors").
Interest is payable on the 2021 Luxembourg Notes semi-annually on June 1 and December 1. Intelsat Luxembourg may redeem some or all of the notes at the applicable redemption prices set forth in the notes.

Table of Contents

The 2021 Luxembourg Notes are senior unsecured obligations of Intelsat Luxembourg and rank equally with Intelsat Luxembourg's other senior unsecured indebtedness.

8 % Senior Notes due 2023

Intelsat Luxembourg had $1.0 billion in aggregate principal amount of the 2023 Luxembourg Notes outstanding at December 31, 2018. $111.7 million principal amount was held by Intelsat Jackson. The 2023 Luxembourg Notes bear interest at 8 % annually and mature in June 2023. The 2023 Luxembourg Notes are guaranteed by the Parent Guarantors.

Interest is payable on the 2023 Luxembourg Notes semi-annually on June 1 and December 1. Intelsat Luxembourg may redeem some or all of the notes at the applicable redemption prices set forth in the notes.

The 2023 Luxembourg Notes are senior unsecured obligations of Intelsat Luxembourg and rank equally with Intelsat Luxembourg's other senior unsecured indebtedness.

12 ½% Senior Notes due 2024

Intelsat Luxembourg had $403.4 million in aggregate principal amount of the 2024 Luxembourg Notes outstanding at December 31, 2018. $182.0 million principal amount was held by ICF, $220.6 million was held by Intelsat Jackson and $0.7 million was held by Intelsat Envision. The 2024 Luxembourg Notes bear interest at 12 ½% annually and mature in November 2024.

Interest is payable on the 2024 Luxembourg Notes semi-annually on May 15 and November 15.

The 2024 Luxembourg Notes are senior unsecured obligations of Intelsat Luxembourg and rank equally with Intelsat Luxembourg's other senior unsecured indebtedness.

(c) Intelsat Connect Finance

9 ½% Senior Notes due 2023

ICF had $1.3 billion in aggregate principal amount of 2023 ICF Notes outstanding at December 31, 2018. The 2023 ICF Notes bear interest at 9 ½% annually and mature in February 2023. These notes are guaranteed by Intelsat Envision and Intelsat Luxembourg.

Interest is payable on the 2023 ICF Notes semi-annually on June 15 and December 15. ICF may redeem the 2023 ICF Notes, in whole or in part, prior to August 15, 2020, at a price equal to 100% of the principal amount plus the applicable premium described in the notes. Thereafter, ICF may redeem some or all of the notes at the applicable redemption prices set forth in the notes.

(d) Intelsat Jackson

9 ½% Senior Secured Notes due 2022

Intelsat Jackson had $490.0 million in aggregate principal amount of 2022 Jackson Secured Notes outstanding at December 31, 2018. The 2022 Jackson Secured Notes bear interest at 9 ½% annually and mature in September 2022. These notes are guaranteed by ICF and certain of Intelsat Jackson's subsidiaries.

Interest is payable on the 2022 Jackson Secured Notes semi-annually on March 30 and September 30. Intelsat Jackson may redeem some or all of the notes at the applicable redemption prices set forth in the notes.

The 2022 Jackson Secured Notes are senior secured obligations of Intelsat Jackson.

8% Senior Secured Notes due 2024

Intelsat Jackson had $1.3 billion in aggregate principal amount of 2024 Jackson Secured Notes outstanding at December 31, 2018. The 2024 Jackson Secured Notes bear interest at 8% annually and mature in February 2024. These notes are guaranteed by ICF and certain of Intelsat Jackson's subsidiaries.

Table of Contents

Interest is payable on the 2024 Jackson Secured Notes semi-annually on February 15 and August 15. Intelsat Jackson may redeem some or all of the notes at the applicable redemption prices set forth in the notes.
The 2024 Jackson Secured Notes are senior secured obligations of Intelsat Jackson.
5 ½% Senior Notes due 2023
Intelsat Jackson had $2.0 billion in aggregate principal amount of the 2023 Jackson Notes outstanding at December 31, 2018. The 2023 Jackson Notes bear interest at 5 ½% annually and mature in August 2023. These notes are guaranteed by the Parent Guarantors, Intelsat Luxembourg, ICF and certain of Intelsat Jackson's subsidiaries.
Interest is payable on the 2023 Jackson Notes semi-annually on February 1 and August 1. Intelsat Jackson may redeem some or all of the 2023 Jackson Notes at the applicable redemption prices set forth in the notes.
The 2023 Jackson Notes are senior unsecured obligations of Intelsat Jackson and rank equally with Intelsat Jackson's other senior unsecured indebtedness.
9 ¾% Senior Notes due 2025
Intelsat Jackson had $1.5 billion in aggregate principal amount of the 2025 Jackson Notes outstanding at December 31, 2018. The 2025 Jackson Notes bear interest at 9 ¾% annually and mature in July 2025. These notes are guaranteed by the Parent Guarantors, Intelsat Luxembourg, ICF and certain of Intelsat Jackson's subsidiaries.
Interest is payable on the 2025 Jackson Notes semi-annually on January 15 and July 15. Intelsat Jackson may redeem some or all of the 2025 Jackson Notes at any time prior to July 15, 2021 at a price equal to 100% of the principal amount thereof plus the applicable premium described in the notes. Thereafter, Intelsat Jackson may redeem some or all of the notes at the applicable redemption prices set forth in the notes.
The 2025 Jackson Notes are senior unsecured obligations of Intelsat Jackson and rank equally with Intelsat Jackson's other senior unsecured indebtedness.
8 ½% Senior Unsecured Notes due 2024
Intelsat Jackson had $3.0 billion in aggregate principal amount of the 2024 Jackson Senior Unsecured Notes outstanding at December 31, 2018. The 2024 Jackson Senior Unsecured Notes bear interest at 8 ½% annually and mature in October 2024. These notes are guaranteed by the Parent Guarantors, Intelsat Luxembourg, ICF and certain of Intelsat Jackson's subsidiaries.
Interest is payable on the 2024 Jackson Senior Unsecured Notes semi-annually on April 15 and October 15. Intelsat Jackson may redeem some or all of the 2024 Jackson Senior Unsecured Notes at any time prior to October 15, 2020 at a price equal to 100% of the principal amount thereof plus the applicable premium described in the notes. Thereafter, Intelsat Jackson may redeem some or all of the 2024 Jackson Senior Unsecured Notes at the applicable redemption prices set forth in the notes.

The 2024 Jackson Senior Unsecured Notes are senior unsecured obligations of Intelsat Jackson and rank equally with Intelsat Jackson's other senior unsecured indebtedness.
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 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%.

Table of Contents

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 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

Table of Contents

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.

Note 13 Derivative Instruments and Hedging Activities

Undesignated Interest Rate Cap Contracts

During 2017, we entered into interest rate cap contracts, and amended them in May 2018, to mitigate the risk of interest rate increases on the floating rate portion of our senior secured credit facilities with a notional value of $2.4 billion. The fair value of the derivative included in “Other assets” on the consolidated balance sheet as of December 31, 2017 and 2018 was $22.3 million and $33.1 million, respectively.

Preferred Stock Warrant

During 2017, we were issued a warrant to purchase preferred shares of one of our investments. We concluded that the warrant is a free standing derivative in accordance with FASB ASC 815. The fair value of the derivative, included in “Other assets” on the consolidated balance sheet as of December 31, 2017 and 2018 was $4.1 million.

The following table sets forth the fair value of our derivatives by category (in thousands):

Derivatives not designated as hedging instruments	Balance Sheet Location	December 31, 2017	December 31, 2018
Undesignated interest rate cap	Other assets	$ 22,336	$ 33,086
Preferred stock warrant	Other assets	4,100	4,100
Total derivatives		$ 26,436	$ 37,186

The following table sets forth the effect of the derivative instruments in our consolidated statements of operations (in thousands):

Derivatives not designated as hedging instruments	Presentation in Statement of Operations	Year Ended December 31, 2016	Year Ended December 31, 2017	Year Ended December 31, 2018
Undesignated interest rate cap	Included in interest expense, net	$ —	$ 1,006	$ (14,435)
Preferred stock warrant	Included in other expense, net	—	—	—
Total loss (gain) on derivative financial instruments		$ —	$ 1,006	$ (14,435)

Note 14 Income Taxes

In October 2016, the FASB issued ASU 2016-16, Income Taxes (Topic 740): Intra-Entity Transfers of Assets Other Than Inventory, which is intended to improve the accounting for the income tax consequences of intra-entity transfers of assets other than inventory. The amendments in ASU 2016-16 eliminate the current requirement to defer the recognition of current and deferred income taxes for an intra-entity asset transfer until the asset has been sold to an

outside party. ASU 2016-16 is effective for interim and annual periods beginning after December 15, 2017 for public business entities, on a modified retrospective basis. Early adoption is permitted as of the beginning of an annual reporting period for which interim or annual financial statements have not been issued. We adopted the amendments in the first quarter of 2018 and this resulted in approximately a $170 million benefit to accumulated deficit. The benefit relates to certain deferred intercompany gains/losses,

Table of Contents

mostly in connection with a series of intercompany transactions in 2011 and 2017 and related steps that reorganized the ownership of our assets among our subsidiaries.

On December 22, 2017, the U.S. Tax Cuts and Jobs Act (the "Act") was signed into law. The Act includes a number of provisions, including the lowering of the U.S. corporate tax rate from 35 percent to 21 percent, effective January 1, 2018. The Act limits our U.S. interest expense deductions to approximately 30 percent of EBITDA through December 31, 2021 and approximately 30 percent of earnings before net interest and taxes thereafter. The Act also introduced a new minimum tax, the Base Erosion Anti-Abuse Tax ("BEAT"). We are treating the BEAT as a period cost.

The Company recognized the income tax effects of The Act in its 2017 financial statements in accordance with Staff Accounting Bulletin No. 118, which provides SEC staff guidance for the application of ASC Topic 740, Income Taxes, in the reporting period in which The Act was signed into law.

The Company measures deferred tax assets and liabilities using enacted tax rates that will apply in the years in which the temporary differences are expected to be recovered or paid. Accordingly, the company's U.S. deferred tax assets and liabilities were remeasured to reflect the reduction in the U.S. corporate income tax rate from 35 percent to 21 percent, resulting in a $28.0 million decrease in net deferred tax liabilities as of December 31, 2017.

On July 2, 2018, we implemented a series of internal transactions and related steps that reorganized the ownership of certain of our assets among our subsidiaries in order to enhance our ability to efficiently transact business (the "2018 Internal Reorganization"). The 2018 Internal Reorganization resulted in the majority of our operations being owned by a U.S. partnership, with our wholly owned Luxembourg and U.S. subsidiaries as partners. Our tax expense recorded in the year ended December 31, 2018 was largely attributable to the 2018 Internal Reorganization, during which we recorded a deferred tax liability associated with the partners' outside basis in the partnership.

The following table summarizes our total income (loss) before income taxes (in thousands):

	Year Ended December 31, 2016	Year Ended December 31, 2017	Year Ended December 31, 2018
Domestic income (loss) before income taxes	$ 938,156	$ (18,149)	$ (424,590)
Foreign income (loss) before income taxes	71,942	(85,535)	(41,031)
Total income (loss) before income taxes	$ 1,010,098	$ (103,684)	$ (465,621)

The primary reason for the variance in domestic income before income tax was that our Luxembourg entities recorded a net gain on the extinguishment of debt in 2016. No comparable amount was recorded in 2017 or 2018.

The provision for (benefit from) income taxes consisted of the following (in thousands):

	Year Ended December 31, 2016	Year Ended December 31, 2017	Year Ended December 31, 2018
Current income tax provision (benefit)			
Domestic	$ (35)	$ (125)	$ 792
Foreign	25,721	27,309	50,117
Total	25,686	27,184	50,909
Deferred income tax provision (benefit):			
Domestic	(80)	72	—
Foreign	(9,620)	43,874	79,160
Total	(9,700)	43,946	79,160
Total income tax provision:	$ 15,986	$ 71,130	$ 130,069

The income tax provision (benefit) was different from the amount computed using the Luxembourg statutory income tax rate of 26.01% for the reasons set forth in the following table (in thousands):

Table of Contents

	Year Ended December 31, 2016	Year Ended December 31, 2017	Year Ended December 31, 2018
Expected tax provision (benefit) at Luxembourg statutory income tax rate	$ 295,150	$ (28,078)	$ (121,108)
Foreign income tax differential	51,787	66,242	2,216
Lux Financing Activities	(8,279)	30,232	51,250
Tax deductible impairment charges in Luxembourg subsidiaries	(1,280,759)	—	—
Change in tax rate	416,156	(28,250)	(684)
Changes in unrecognized tax benefits	(1,629)	(79)	(2,205)
Changes in valuation allowance	554,479	40,853	746,905
Tax effect of 2011 Intercompany Sale	(6,701)	(6,073)	1,655
Foreign tax credits	(5,480)	(3,107)	138
Research and development tax credits	(3,275)	(2,786)	—
2018 Internal Reorganization	—	—	(549,382)
Other	4,537	2,176	1,284
Total income tax provision	$ 15,986	$ 71,130	$ 130,069

The majority of our operations are located in Luxembourg, the United States and the United Kingdom. Our Luxembourg companies that file tax returns as a consolidated group generated taxable income for the year ended December 31, 2018, largely due to the 2018 Internal Reorganization. The taxable income generated by our Luxembourg group was offset by available net operating loss carryforwards. Due to the inherent uncertainty associated with the realization of taxable income in the foreseeable future, we recorded a full valuation allowance against the net operating losses generated in Luxembourg. The difference between tax expense reported in the consolidated statements of operations and tax computed at statutory rates is attributable to the valuation allowance on losses generated in Luxembourg, the provision for foreign taxes, which were principally in the United States and the United Kingdom, as well as withholding taxes on revenue earned in Brazil, and for 2018, the impacts of the 2018 Internal Reorganization.

The following table details the composition of the net deferred tax balances as of December 31, 2017 and 2018 (in thousands):

	As of December 31, 2017	As of December 31, 2018
Long-term deferred taxes, net	$ (48,434)	$ (82,488)
Other assets	14,583	20,969
Net deferred taxes	$ (33,851)	$ (61,519)

The components of the net deferred tax liability were as follows (in thousands):

Table of Contents

	As of December 31, 2017	As of December 31, 2018
Deferred tax assets:		
Accruals and advances	$ 17,169	$ 6,001
Amortizable intangible assets	13,421	1,133,702
Non-Amortizable intangible assets	147,332	42,265
Performance incentives	7,289	—
Customer deposits	16,064	3,404
Bad debt reserve	2,033	1,350
Accrued retirement benefits	43,592	—
Disallowed interest expense carryforward	75,546	74,825
Net operating loss carryforward	3,840,759	2,964,634
Tax credits	11,335	12,235
Tax basis differences in investments and affiliates	—	78,950
Other	8,418	2,346
Total deferred tax assets	4,182,958	4,319,712
Deferred tax liabilities:		
Satellites and other property and equipment	(266,330)	(80,376)
Amortizable intangible assets	(366,777)	(8,948)
Non-amortizable intangible assets	(103,730)	(31,359)
Tax basis differences in investments and affiliates	(6,753)	(51,645)
Other	(16,875)	(5,654)
Total deferred tax liabilities	(760,465)	(177,982)
Valuation allowance	(3,456,344)	(4,203,249)
Total net deferred tax liabilities	$ (33,851)	$ (61,519)

As of December 31, 2017 and 2018, our consolidated balance sheets included a deferred tax asset in the amount of $3.8 billion and $3.0 billion, respectively, attributable to the future benefit from the utilization of certain net operating loss carryforwards. In addition, our balance sheets as of December 31, 2017 and December 31, 2018 included $15.4 million and $12.2 million of deferred tax assets, respectively, attributable to the future benefit from the utilization of tax credit carryforwards. As of December 31, 2018, we had tax-effected U.S. federal, state and other foreign tax net operating loss carryforwards of $64.7 million expiring, for the most part, between 2023 and 2037, and tax effected Luxembourg net operating loss carryforwards of $2.9 billion without expiration. These Luxembourg net operating loss carryforwards were caused primarily by our interest expense, satellite depreciation and amortization and impairment charges related to investments in subsidiaries, goodwill and other intangible assets. Our research and development credit of $0.07 million may be carried forward to 2037. Our foreign tax credit of $12.1 million may be carried forward to 2026.

Our valuation allowance as of December 31, 2017 and 2018 was $3.5 billion and $4.2 billion, respectively. Almost all of the valuation allowance relates to Luxembourg net operating loss carryforwards and deferred tax assets created by differences between the U.S. GAAP and the Luxembourg tax basis in our assets. Certain operations of our subsidiaries are controlled by various intercompany agreements which provide these subsidiaries with predictable operating profits. Other subsidiaries, principally Luxembourg and U.S. subsidiaries, are subject to the risks of our overall business conditions which make their earnings less predictable. Our valuation allowance as of December 31, 2018 also relates to certain deferred tax assets in our U.S. subsidiaries, including foreign tax credit carryforward and disallowed interest expense carryforward.

The following table summarizes the activity related to our unrecognized tax benefits (in thousands):

	2017	2018

Balance at January 1	$36,167	$31,380
Increases related to current year tax positions	2,193	928
Increases related to prior year tax positions	304	234
Decreases related to prior year tax positions	(3)	(81)
Expiration of statute of limitations for the assessment of taxes	(7,281)	(3,317)
Balance at December 31	$31,380	$29,144

Table of Contents

As of December 31, 2017 and December 31, 2018 our gross unrecognized tax benefits were $31.4 million and $29.1 million, respectively (including interest and penalties), of which $27.8 million and $25.6 million, respectively, if recognized, would affect our effective tax rate. As of December 31, 2017 and 2018, we had recorded reserves for interest and penalties in the amount of $0.6 million. We continue to recognize interest and, to the extent applicable, penalties with respect to the unrecognized tax benefits as income tax expense. Since December 31, 2018, the change in the balance of unrecognized tax benefits consisted of an increase of $0.9 million related to current tax positions, an increase of $0.1 million related to prior tax positions, and a decrease of $3.3 million due to the expiration of statute of limitations for the assessment of taxes.

We operate in various taxable jurisdictions throughout the world and our tax returns are subject to audit and review from time to time. We consider Luxembourg, the United States, the United Kingdom and Brazil to be our significant tax jurisdictions. Our Luxembourg, U.S., United Kingdom and Brazilian subsidiaries are subject to income tax examination for periods after December 31, 2012. Within the next twelve months, we believe that there are no jurisdictions in which the outcome of unresolved tax issues or claims is likely to be material to our results of operations, financial position or cash flows.

Certain of our UK and U.S. subsidiaries have been in a dispute with the Indian tax administration over withholding taxes. This dispute stretches over many tax years, some as early as 2001. The assessments we have received for those years are in various stages of appeal, some in the Indian court system. So far, the Indian courts have ruled in our favor. We have been informed that certain lower court decisions are likely to be reviewed by the Indian Supreme Court in the near future. We believe it to be more likely than not that the Indian Supreme Court will rule in our favor. We do not expect even an unfavorable ruling to have any material effect on our results of operations, financial position or cash flows, because most of the disputed withholding taxes relate to customer contracts under which our customers indemnified us for such taxes.

On March 29, 2017, the UK Government gave formal notice of its intention to leave the European Union (“EU”). This notice started the two-year negotiation period to establish the withdrawal terms. Once the UK ultimately withdraws from the EU, existing tax reliefs and exemptions on intra-European transactions will likely cease to apply to transactions between UK entities and EU entities. In addition, transactions with non-EU countries, such as the U.S., may also be affected. As of December 31, 2018, all relevant tax laws and treaties remain unchanged and the tax consequences are unknown. Therefore, we have not recognized any impacts of the withdrawal in the income tax provision as of December 31, 2018. We will recognize any impacts to the tax provision when enacted changes in tax laws or treaties between the UK and the EU or individual EU member states occur, but no later than the date of the withdrawal.

On December 13, 2018, the Internal Revenue Service and the Department of the Treasury released proposed regulations with respect to the BEAT. The BEAT is a minimum tax established by the Act that excludes certain payments made by U.S. corporations or subsidiaries to foreign related parties from the determination of taxable income. The proposed regulations clarify which taxpayers are subject to the BEAT and how the BEAT rules apply to certain payments and transactions. The proposed regulations, if adopted, would be effective for the Company for its 2018 tax year. The proposed regulations could result in additional payments and transactions of the Company being subject to the BEAT which could increase the Company’s tax expense and cash taxes. It is unclear when the proposed regulations will be adopted, whether they will be adopted in their current form or whether they will be adopted at all. The Company is currently evaluating the impact that the proposed regulations could have on its future tax expense. The Company has not included any impacts from the proposed regulations in its tax provision as of and for the year ended December 31, 2018.

Note 15 Contractual Commitments

In the further development and operation of our commercial global communications satellite system, significant additional expenditures are anticipated. In connection with these and other expenditures, we have a significant amount of long-term debt, as described in “Note 12—Long-Term Debt.” In addition to these debt and related interest obligations,

we have expenditures represented by other contractual commitments. The additional expenditures as of December 31, 2018 and the expected year of payment are as follows (in thousands):

Table of Contents

	Satellite Construction and Launch Obligations	Satellite Performance Incentive Obligations	Horizons-3 Satellite LLC Contribution Obligations (1)	Operating Leases	Sublease Rental Income	Customer and Vendor Contracts	Total
2019	$ 273,875	$ 59,783	$ 4,500	$ 20,065	$ (826)	$ 140,577	$ 497,974
2020	216,615	50,021	11,700	18,730	(745)	37,492	333,813
2021	133,890	49,220	13,300	14,832	(535)	29,658	240,365
2022	11,842	38,503	15,700	13,979	(372)	26,510	106,162
2023	10,232	27,053	15,300	13,600	(78)	25,581	91,688
2024 and thereafter	47,915	131,136	43,600	80,216	(150)	41,505	344,222
Total contractual commitments	$ 694,369	$ 355,716	$ 104,100	$ 161,422	$ (2,706)	$ 301,323	$ 1,614,224

(1) See Note 10(b)—Investments—Horizons-3 Satellite LLC.

(a) Satellite Construction and Launch Obligations

As of December 31, 2018, we had approximately $694.4 million of expenditures remaining under our existing satellite construction and launch contracts. Satellite launch and in-orbit insurance contracts related to future satellites to be launched are cancelable up to thirty days prior to the satellite's launch. As of December 31, 2018, we did not have any non-cancelable commitments related to existing launch insurance or in-orbit insurance contracts for satellites to be launched.

The satellite construction contracts typically require that we make progress payments during the period of the satellites' construction. The satellite construction contracts contain provisions that allow us to terminate the contracts with or without cause. If terminated without cause, we would forfeit the progress payments and be subject to termination payments that escalate with the passage of time. If terminated for cause, we would be entitled to recover any payments we made under the contracts and certain liquidated damages as specified in the contracts.

(b) Satellite Performance Incentive Obligations

Satellite construction contracts also typically require that we make orbital incentive payments (plus interest as defined in each agreement with the satellite manufacturer) over the orbital life of the satellite. The incentive obligations may be subject to reduction or refund if the satellite fails to meet specific technical operating standards. As of December 31, 2018, we had $355.7 million of satellite performance incentive obligations, including future interest payments.

(c) Operating Leases

We have commitments for operating leases primarily relating to equipment and office facilities, including our U.S. Administrative Headquarters in McLean, Virginia. As of December 31, 2018, the total obligation related to operating leases, net of sublease income on leased facilities and rental income, was $158.7 million. Rental income and sublease income are included in other expense, net in the accompanying consolidated statements of operations.

Total rent expense for the years ended December 31, 2016, 2017 and 2018, was $14.0 million, $14.8 million and $14.0 million, respectively.

(d) Customer and Vendor Contracts

We have contracts with certain customers that require us to provide equipment, services and other support during the term of the related contracts. We also have long-term contractual obligations with service providers primarily for the operation of certain of our satellites. As of December 31, 2018, we had commitments under these customer and vendor contracts which totaled approximately $301.3 million related to the provision of equipment, services and other support.

Note 16 Contingencies

We are subject to litigation in the ordinary course of business. Management does not believe that the resolution of any pending proceedings would have a material adverse effect on our financial position or results of operations.

Table of Contents

Note 17 Business and Geographic Segment Information

We operate in a single industry segment in which we provide satellite services to our communications customers around the world. Our revenues are disaggregated by billing region, service type and customer set. Revenue by region is based on the locations of customers to which services are billed. Our satellites are in geosynchronous orbit, and consequently are not attributable to any geographic location. Of our remaining assets, substantially all are located in the United States.

The following table disaggregates revenue by billing region (in thousands, except percentages):

	Year Ended December 31, 2016		Year Ended December 31, 2017		Year Ended December 31, 2018	
North America	$1,077,886	49 %	$1,080,736	50 %	$1,112,774	51 %
Europe	300,003	14 %	272,039	13 %	257,747	12 %
Latin America and Caribbean	325,933	15 %	304,379	14 %	284,948	13 %
Africa and Middle East	286,258	13 %	292,505	14 %	274,853	13 %
Asia-Pacific	197,967	9 %	198,953	9 %	230,868	11 %
Total	$2,188,047	100%	$2,148,612	100%	$2,161,190	100%

Approximately 8%, 9% and 11% of our revenue was derived from our largest customer during each of the years ended December 31, 2016, 2017 and 2018, respectively. Our ten largest customers accounted for approximately 31%, 34% and 37% of our revenue for the years ended December 31, 2016, 2017 and 2018, respectively.

We earn revenue primarily by providing services to our customers using our satellite transponder capacity. Our customers
generally obtain satellite capacity from us by placing an order pursuant to one of several master customer service agreements. On-network services are comprised primarily of services delivered on our owned network infrastructure, as well as commitments for third-party capacity, generally long-term in nature, that we integrate and market as part of our owned infrastructure. In the case of third-party services in support of government applications, the commitments for third-party capacity are shorter and matched to the government contracting period, and thus remain classified as off-network services. Off-network services can include transponder services and other satellite-based transmission services, such as mobile satellite services (“MSS”), which are sourced from other operators, often in frequencies not available on our network. Under the category Off-Network and Other Revenues, we also include revenues from consulting and other services.

The following table disaggregates revenue by type of service (in thousands, except percentages):

	Year Ended December 31, 2016		Year Ended December 31, 2017		Year Ended December 31, 2018	
On-Network Revenues						
Transponder services	$1,561,108	72 %	$1,543,384	72 %	$1,570,278	73 %
Managed services	414,758	19 %	412,147	19 %	393,264	18 %
Channel	9,134	— %	5,405	— %	4,250	— %
Total on-network revenues	1,985,000	91 %	1,960,936	91 %	1,967,792	91 %
Off-Network and Other Revenues						
Transponder, MSS and other off-network services	157,212	7 %	141,845	7 %	150,186	7 %
Satellite-related services	45,835	2 %	45,831	2 %	43,212	2 %
Total off-network and other revenues	203,047	9 %	187,676	9 %	193,398	9 %
Total	$2,188,047	100%	$2,148,612	100%	$2,161,190	100%

Our revenues for media, network services, government and satellite-related services were as follows: $937.7 million, $798.1 million, $392.0 million, and $33.4 million, respectively for the year ended December 31, 2018; $910.1 million,

$851.6 million, $352.6 million, and $34.3 million, respectively for the year ended December 31, 2017; and $868.1 million, $900.3 million, $387.1 million, and $32.5 million, respectively for the year ended December 31, 2016.

Table of Contents

Note 18 Related Party Transactions

(a) Shareholders' Agreements

Certain shareholders of Intelsat Global S.A. entered into shareholders' agreements on February 4, 2008. The shareholders' agreements were assigned to Intelsat S.A. by amendments effective as of March 30, 2012 in connection with our initial public offering in April 2013, and then terminated in December 2018 and replaced by a new agreement. The shareholders agreement provides, among other things, specific rights to and limitations upon the holders of Intelsat S.A.'s share capital with respect to shares held by such holders.

(b) Governance Agreement

Prior to the consummation of the IPO, we entered into a governance agreement with our shareholder affiliated with BC Partners (the "BC Shareholder"), our shareholder affiliated with Silver Lake (the "Silver Lake Shareholder") and David McGlade, our Non-Executive Chairman. This agreement was terminated in December 2018 and replaced with a new agreement between the BC Shareholder and the Company, containing provisions relating to the composition of our board of directors and certain other matters.

(c) Indemnification Agreements

We have entered into agreements with our executive officers and directors to provide contractual indemnification in addition to the indemnification provided for in our articles of incorporation.

(d) Horizons Holdings

We have a 50% ownership interest in Horizons Holdings as a result of a joint venture with JSAT (see Note 10(a)—Investments—Horizons Holdings).

(e) Horizons 3 Satellite LLC

We have a 50% ownership interest in Horizons 3 as a result of a joint venture with JSAT (see Note 10(b)—Investments—Horizons-3 Satellite LLC).

(f) Additional BC Shareholder Share Purchase in June 2018

In connection with an offering of common shares by the Company completed in June 2018, the BC Shareholder purchased an additional 2,021,563 shares of Intelsat S.A. at the public offering price of $14.84 per share for approximately $30.0 million in the aggregate.

Table of Contents

Note 19 Quarterly Results of Operations (in thousands, unaudited)

	Quarter Ended			
2017	March 31	June 30	September 30	December 31
Revenue (1)	$538,484	$533,229	$538,759	$ 538,140
Income from operations (1)	216,727 (3)	228,245 (3)	233,165 (3)	232,944 (3)
Net loss	(33,642)(4)	(22,800)	(29,416)(4)	(88,956)
Net loss attributable to Intelsat S.A.	(34,570)(4)	(23,795)	(30,412)(4)	(89,951)
Net loss per share attributable to Intelsat S.A.:				
Basic (2)	$(0.29)	$(0.20)	$(0.26)	$ (0.75)
Diluted (2)	(0.29)	(0.20)	(0.26)	(0.75)

	Quarter Ended			
2018	March 31	June 30	September 30	December 31
Revenue (1)	$543,782	$537,714	$536,922	$ 542,771
Income from operations (1)	234,472	237,755	237,269	232,374
Net loss	(65,849)	(45,840)(5)	(373,642)(5)	(110,359)(5)
Net loss attributable to Intelsat S.A.	(66,801)	(46,828)(5)	(374,631)(5)	(111,346)(5)
Net loss per share attributable to Intelsat S.A.:				
Basic (2)	$(0.56)	$(0.38)	$(2.74)	$ (0.81)
Diluted (2)	(0.56)	(0.38)	(2.74)	(0.81)

(1) Our quarterly revenue and operating income (loss) are generally not impacted by seasonality, as customer contracts for satellite utilization are generally long-term. Revenue increases are attributable to ASC 606 adjustments. Excluding the impact of ASC 606 adjustments, revenue declines were primarily due to a decrease in revenue from our network services customers, mainly due to declines for enterprise services, wireless infrastructure and point-to-point trunking applications, as well as a decrease in revenue from media customers. These declines were partially offset by an increase in revenue from our network services customers for maritime and mobility applications and an increase in revenue from off-network and third party applications.

(2) Basic and diluted earnings per share are computed independently for each of the quarters presented. Therefore, the sum of quarterly basic and diluted per share information may not equal annual basic and diluted earnings per share.

(3) As a result of our adoption of ASU 2017-07 on January 1, 2018, the Company reclassified a net credit for pension and postretirement benefits from operating expenses to other income for the quarters within 2017 to conform to the current year quarters' presentation. See Note 7—Retirement Plan and Other Retiree Benefits for additional details on the impact of the adoption of ASU 2017-07.

(4) The quarter ended March 31, 2017 includes a $0.5 million gain on early extinguishment of debt related to the Second 2018 Luxembourg Exchange described above. The quarter ended September 30, 2017 includes a $4.6 million loss on early extinguishment of debt related to the July 2017 Intelsat Jackson Senior Notes Refinancing described above.

(5) The quarter ended June 30, 2018 includes a $22.1 million gain on early extinguishment of debt related to the repurchase of the 2021 Luxembourg Notes. The quarter ended September 30, 2018 includes a $204.1 million loss on early extinguishment of debt related to the 2023 ICF Notes and the 2024 Jackson Senior Unsecured Notes. The quarter ended December 31, 2018 includes a $17.8 million loss on early extinguishment of debt related to the repurchase of the 2024 Jackson Senior Unsecured Notes and the redemption of 2021 Jackson Notes (see Note 12—Long-Term Debt).

Table of Contents

SCHEDULE II—VALUATION AND QUALIFYING ACCOUNTS

Description	Balance at Beginning of Period	Charged to Costs and Expenses	Deductions	Balance at End of Period
	(in thousands)			
Year ended December 31, 2016:				
Allowance for doubtful accounts	$37,178	$ 24,591	$ (7,025)	$ 54,744
Year ended December 31, 2017:				
Allowance for doubtful accounts	$54,744	$ (4,094)	$ (20,981)	$ 29,669
Year ended December 31, 2018:				
Allowance for doubtful accounts	$29,669	$ (836)	$ (291)	$ 28,542

See accompanying notes to consolidated financial statements.