

TELUS CORPORATION
Management's discussion and analysis
2016

Caution regarding forward-looking statements

The terms *TELUS*, *the Company*, *we*, *us* and *our* refer to TELUS Corporation and, where the context of the narrative permits or requires, its subsidiaries.

This Management’s discussion and analysis (MD&A) including, in particular, *Section 9 General trends, outlook and assumptions*, contains forward-looking statements and forward-looking information within the meaning of applicable securities laws (collectively, forward-looking statements).

Forward-looking statements include any statements that do not refer to historical facts. They include, but are not limited to, statements about our objectives and our strategies to achieve those objectives, about our annual outlook, targets, multi-year dividend growth program, multi-year share purchase program, statements about anticipated trends regarding our business and the environment in which we operate (in particular: *Section 5 Discussion of operations* and *Section 9 General trends, outlook and assumptions*), and much of our discussion regarding risk mitigation. Forward-looking statements are typically identified by the words *assumption*, *goal*, *guidance*, *objective*, *outlook*, *strategy*, *target* and other similar expressions, or future or conditional verbs such as *aim*, *anticipate*, *believe*, *could*, *estimate*, *expect*, *intend*, *may*, *plan*, *predict*, *seek*, *should*, *strive* and *will*.

Forward-looking statements are subject to inherent risks and uncertainties and are based on assumptions about future economic conditions and courses of action, including the assumptions mentioned in *Section 9 General trends, outlook and assumptions* and *Section 10 Risks and risk management* in this MD&A. The assumptions on which our forward-looking statements are based may ultimately prove to have been inaccurate and, as a result, our actual results or events may differ materially from our expectations expressed in or implied by the forward-looking statements.

Risks and uncertainties that could also cause actual results or events to differ materially from the forward-looking statements made herein and in other TELUS filings include, but are not limited to, competitive intensity; technological demands and disruptive changes; regulatory conditions and changes to the regulatory regime; and economic, financial and other risks, including those risks described or referred to in *Section 10 Risks and risk management* of this MD&A, which is incorporated by reference in this cautionary statement but is not intended to be a complete list of the risks that could affect the Company. Many of these factors are beyond our control or our current expectations or knowledge. Additional risks and uncertainties not currently known to us or that we currently deem to be immaterial may also have a material adverse effect on our financial position, financial performance, cash flows, business or reputation. Except as otherwise indicated in this MD&A, the forward-looking statements made herein do not reflect the potential impact of any non-recurring or special items or any mergers, acquisitions, dispositions or other business combinations or transactions that may be announced or that may occur after the date of this document.

Readers are cautioned not to place undue reliance on forward-looking statements. Forward-looking statements in this MD&A describe our expectations and are based on our assumptions as at the date of this MD&A and are subject to change after this date. Except as required by law, we disclaim any intention or obligation to update or revise any forward-looking statements.

This cautionary statement qualifies all of the forward-looking statements in this MD&A.

Management’s discussion and analysis (MD&A)

February 9, 2017

Contents

Section	Page	Subsection
1. Introduction	4	1.1 Preparation of the MD&A
	4	1.2 The environment in which we operate
	5	1.3 Highlights of 2016
	9	1.4 Performance scorecard (key performance measures)
2. Core business and strategy	12	2.1 Core business
	12	2.2 Strategic imperatives
3. Corporate priorities	14	
4. Capabilities	16	4.1 Principal markets addressed and competition
	18	4.2 Operational resources
	19	4.3 Liquidity and capital resources
	21	4.4 Disclosure controls and procedures and changes in internal control over financial reporting
5. Discussion of operations	23	5.1 Selected annual information
	24	5.2 Summary of consolidated quarterly results, trends and fourth quarter recap
	26	5.3 Consolidated operations
	29	5.4 Wireless segment
	33	5.5 Wireline segment
6. Changes in financial position	37	
7. Liquidity and capital resources	38	7.1 Overview
	39	7.2 Cash provided by operating activities
	39	7.3 Cash used by investing activities
	40	7.4 Cash provided (used) by financing activities
	42	7.5 Liquidity and capital resource measures
	43	7.6 Credit facilities
	44	7.7 Sale of trade receivables
	44	7.8 Credit ratings
	45	7.9 Financial instruments, commitments and contingent liabilities
	49	7.10 Outstanding share information
	49	7.11 Transactions between related parties
8. Accounting matters	50	8.1 Critical accounting estimates
	55	8.2 Accounting policy developments
9. General trends, outlook and assumptions	57	9.1 Telecommunications industry in 2016
	58	9.2 Telecommunications industry general outlook and trends
	59	9.3 TELUS assumptions for 2017
	60	9.4 Telecommunications industry regulatory developments and proceedings
10. Risks and risk management	64	10.1 Overview
	66	10.2 Competition
	69	10.3 Technology
	73	10.4 Regulatory matters
	75	10.5 Human resources
	75	10.6 Process risks
	78	10.7 Financing, debt requirements and returning cash to shareholders
	79	10.8 Taxation matters
	80	10.9 Litigation and legal matters
	82	10.10 Health, safety and environment
	84	10.11 Human-caused and natural threats
	85	10.12 Economic growth and fluctuations
11. Definitions and reconciliations	86	11.1 Non-GAAP and other financial measures
	89	11.2 Operating indicators

1. Introduction

1.1 Preparation of the MD&A

The following sections are a discussion of the consolidated financial position and financial performance of TELUS for the year ended December 31, 2016, and should be read together with TELUS’ December 31, 2016 audited Consolidated financial statements (subsequently referred to as the Consolidated financial statements). The generally accepted accounting principles (GAAP) we use are the International Financial Reporting Standards (IFRS) as issued by the International Accounting Standards Board (IASB). Our Consolidated financial statements comply with IFRS-IASB and Canadian GAAP. Our use of the term IFRS in this MD&A is a reference to these standards. In our discussion, we also use certain non-GAAP financial measures to evaluate our performance, monitor compliance with debt covenants and manage our capital structure. These measures are defined, qualified and reconciled with their nearest GAAP measures in *Section 11.1*. All currency amounts are in Canadian dollars, unless otherwise specified.

Additional information relating to the Company, including our annual information form and other filings with securities commissions or similar regulatory authorities in Canada, is available on SEDAR (www.sedar.com). Our filings with the Securities and Exchange Commission in the United States, including Form 40-F, are available on EDGAR (www.sec.gov).

Our disclosure controls and procedures are designed to provide reasonable assurance that all relevant information is gathered and reported to senior management on a timely basis, so that appropriate decisions can be made regarding public disclosure. This MD&A and the Consolidated financial statements were reviewed by TELUS’ Audit Committee and approved by our board of directors (our Board) for issuance on February 9, 2017.

1.2 The environment in which we operate

The success of our business and the challenges we face can best be understood with reference to the environment in which we operate, including broader economic factors that affect our customers and us, and the competitive industry in which we operate. Our estimates regarding our environment also form an important part of the assumptions on which our targets are based.

2016 Canadian telecom industry revenues Est. \$60 billion	TELUS 2016 revenues \$12.8 billion	TELUS subscriber connections 12.7 million	TELUS employees 51,250
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Economic growth

We estimate that the rate of economic growth in Canada in 2017 will be 1.8% (1.2% in 2016), both of which are based on a composite of estimates from Canadian banks and other sources. For our incumbent local exchange carrier (ILEC) provinces in Western Canada, we estimate that economic growth in British Columbia (B.C.) will be 2.3% in 2017 (2.9% in 2016), and in Alberta will be between 1.0 to 2.0% in 2017 (estimated contraction of 2.4% in 2016). The Bank of Canada’s January 2017 Monetary Policy Report estimated economic growth in Canada will be 2.1% in 2017 (1.3% in 2016). However, the Bank stated their outlook is subject to considerable uncertainty, particularly concerning trade, given the potential outcomes of yet unknown policies and actions of the incoming U.S. administration.

In respect of the national unemployment rate, Statistics Canada’s Labour Force Survey reported a rate of 6.9% for December 2016 (7.1% reported for December 2015). The unemployment rate for B.C. was 5.8% for December 2016 (6.7% for December 2015), while the unemployment rate for Alberta was 8.5% in December 2016 (7.0% in December 2015).

Canadian telecommunications industry growth

We estimate that industry revenues (including TV revenue and excluding media revenue) grew by approximately 2% in 2016 (2% in 2015). We estimate that the Canadian wireless industry grew in 2016 by approximately one million new subscribers and experienced approximately 5% network revenue growth. Key drivers included the continuing significant growth in wireless applications and data usage and the ongoing movement to more capable smartphones. The wireline market was impacted by continued slow economic growth in 2016, particularly in Alberta. Revenue growth in enhanced data, IP and Internet services continued at a slower pace amid cautious business spending, while declines in higher-margin legacy voice services were ongoing. (See *Section 9 General trends, outlook and assumptions*, *Section 10.2 Competition*, and *Section 10.12 Economic growth and fluctuations*.)

1.3 Highlights of 2016

Collective bargaining and transformative change compensation

In 2015, we commenced collective bargaining with the Telecommunications Workers Union, United Steel Workers Local Union 1944 (TWU), to renew the collective agreement that expired on December 31, 2015. On October 3, 2016, TELUS and the TWU announced that they had reached a tentative five-year collective agreement which would be subject to ratification by members of the TWU. The ratification process was completed in November with a majority of TWU members who cast their ballots voting to accept the tentative agreement. The new collective agreement with the TWU is in place through to December 31, 2021 and covers approximately 37% of our Canadian workforce as at December 31, 2016.

In December 2016, a new collective agreement between TELUS and the Syndicat des agents de maîtrise de TELUS (SAMT) was ratified by a majority of the SAMT members. This collective agreement will take effect on April 1, 2017, and will expire on March 31, 2022. A new collective agreement between TELUS and the Syndicat québécois des employés de TELUS (SQET) was also ratified in December 2016. The new agreement will be effective from January 1, 2018 to December 31, 2022. The current SQET collective agreement will remain in effect until it expires on December 31, 2017.

In the fourth quarter of 2016, we recorded an expense of \$305 million in respect of immediately vesting transformative compensation (transformative compensation) paid to substantially all of our existing unionized and non-unionized Canadian-situated workforces; a portion of the after-tax value for certain lump-sum recipients was paid in Common Shares purchased in the market for that purpose under our normal course issuer bid (NCIB) by an employee benefit plan trust. The one-time payment to unionized employees in the fourth quarter of 2016 represents both a one-time payment in lieu of wage increases for the period July 1, 2016 to December 31, 2018 (a period of 30 months) and a one-time payment as compensation for reductions in certain premium payments and paid time-off provisions that underpin future productivity improvements. A similar approach with respect to salary increases was adopted for management employees. For most of our current Canadian-situated management employees, there was a one-time payment in the fourth quarter of 2016 in lieu of general salary increases for 2017 and 2018. For the unionized and non-unionized workforces, approximately 40% of the after-tax value of such qualifying lump-sum payments was paid in our Common Shares.

For substantially all of our Canadian-situated employees, the next salary increases are planned for 2019. This arrangement will provide us with financial flexibility to make the necessary growth and customer retention investments within a competitive environment.

Investment in TELUS International

In June 2016, we announced the completion of the previously announced agreement with Baring Private Equity Asia (Baring Asia), an Asian-based investment firm that advises funds holding a total of more than \$13 billion (U.S.\$10 billion) in assets, under which it has acquired a 35% non-controlling interest in TELUS International (Cda) Inc. (TELUS International), a global provider of customer service, information technology (IT) and business process outsourcing services. The agreement valued TELUS International at \$1.2 billion. As a result of this collaboration, TELUS International is well positioned to leverage Baring Asia’s deep Asian market presence and worldwide experience and tap into its global network in order to further expand TELUS International’s operations. In connection with the transaction, we arranged an incremental U.S.\$330 million in bank financing, which is secured by assets of TELUS International and its subsidiaries, expires in 2021 and is non-recourse to TELUS Corporation.

Agreement with BCE Inc. regarding Manitoba Telecom Services Inc.

In 2016, we announced an agreement with BCE Inc. (BCE), pursuant to which we would acquire a portion of Manitoba Telecom Services Inc.’s (MTS’) postpaid wireless subscribers and dealer locations in Manitoba, dependent on the successful completion of BCE’s acquisition of MTS. On February 2, 2017, BCE announced that it expected to close its acquisition of MTS by the end of March 2017, subject to Competition Bureau and Innovation, Science and Economic Development Canada (ISED) approvals. As of February 9, 2017, BCE had not received the requisite approvals from the Competition Bureau and ISED.

Leadership changes

On May 16, 2016, we announced the appointment of Doug French as Executive Vice-President and Chief Financial Officer of TELUS. Doug has 30 years of financial management experience and 20 years of career progression within TELUS, including a wide range of key roles as Controller for our largest business units, and more recently as Senior Vice-President, Corporate Controller.

Consolidated highlights

Years ended December 31 (\$ millions, unless noted otherwise)	2016	2015	Change
Consolidated statements of income			
Operating revenues	12,799	12,502	2.4 %
Operating income	2,182	2,353	(7.3)%
Income before income taxes	1,662	1,906	(12.8)%
Net income	1,236	1,382	(10.6)%
Net income attributable to Common Shares	1,223	1,382	(11.5)%
Earnings per share (EPS) (\$)			
Basic EPS	2.06	2.29	(10.0)%
Adjusted basic EPS ¹	2.58	2.58	—
Diluted EPS	2.06	2.29	(10.0)%
Dividends declared per Common Share (\$)	1.84	1.68	9.5 %
Basic weighted-average Common Shares outstanding (millions)	592	603	(1.8)%
Consolidated statements of cash flows			
Cash provided by operating activities	3,219	3,556	(9.5)%
Cash used by investing activities	(2,923)	(4,477)	34.7 %
Capital expenditures (excluding spectrum licences)	(2,968)	(2,577)	(15.2)%
Payments for wireless spectrum licences	(145)	(2,048)	92.9 %
Cash provided (used) by financing activities	(87)	1,084	n/m
Other highlights			
Subscriber connections ² (thousands)	12,673	12,495	1.4 %
EBITDA (earnings before interest, income taxes, depreciation and amortization) ¹	4,229	4,262	(0.8)%
Restructuring and other costs ^{1,3}	479	226	111.9 %
EBITDA – excluding restructuring and other costs ¹	4,708	4,488	4.9 %
Adjusted EBITDA ⁴	4,667	4,488	4.0 %
Adjusted EBITDA margin ⁵ (%)	36.6	35.9	0.7 pts.
Free cash flow ¹	141	1,078	(86.9)%
Net debt to EBITDA – excluding restructuring and other costs ¹ (times)	2.69	2.66	0.03

Notations used in MD&A: n/m – not meaningful; pts. – percentage points.

1 Non-GAAP and other financial measures. See *Section 11.1*.

2 The sum of active wireless subscribers, residential network access lines (NALs), high-speed Internet access subscribers and TELUS TV[®] subscribers (Optik TV[®] and TELUS Satellite TV[®] subscribers), measured at the end of the respective periods based on information in billing and other systems. Subsequent to a review of our subscriber base during the first quarter of 2016, our 2016 opening postpaid wireless subscriber base was reduced by 45,000 and our 2016 opening high-speed Internet subscriber base was increased by 21,000.

3 In the fourth quarter of 2016, we recorded a transformative compensation expense of \$305 million as part of other costs.

4 Adjusted EBITDA excludes restructuring and other costs. In addition, adjusted EBITDA for 2016 excludes net gains and equity income of \$26 million related to real estate joint venture developments and a \$15 million gain from the exchange of wireless spectrum licences.

5 Adjusted EBITDA margin is Adjusted EBITDA divided by Operating revenues, where the calculation of the Operating revenues excludes the net gains and equity income related to real estate joint venture developments, as well as the gain on exchanged wireless spectrum licences.

Operating highlights

- **Consolidated operating revenues** increased by \$297 million in 2016:

Service revenues increased by \$410 million in 2016, mainly due to growth in wireline data services and wireless network revenue, partly offset by the ongoing decline in legacy wireline voice revenue due to technological substitution and continued competitive pressures.

Equipment revenues decreased by \$115 million in 2016, reflecting a combination of higher wireless per-unit subsidies, lower wireless retention volumes, and lower wireline equipment sales activity in the business market, in part due to the economic slowdown, and a focus on providing managed services, rather than equipment-only sales.

Other operating income increased by \$2 million in 2016, reflecting a gain in the second quarter of 2016 on exchange of wireless spectrum licences, and net gains and equity income in the second, third and fourth quarters of 2016 related to real estate joint venture developments, partly offset by non-recurrence of gains on the sale of certain real estate assets in 2015 and a decrease in amounts recognized from the regulatory price cap deferral account.

For additional details on operating revenues, see *Section 5.4 Wireless segment* and *Section 5.5 Wireline segment*.

- During 2016, our total **subscriber connections** increased by 178,000, reflecting a 2.7% increase in wireless postpaid subscribers, a 5.4% increase in TELUS TV subscribers and a 5.7% increase in high-speed Internet subscribers, partly offset by a 6.3% decline in wireless prepaid subscribers and a 6.3% decline in wireline residential NALs.

Our postpaid wireless subscriber net additions were 243,000 in 2016, down slightly from 2015, as higher gross additions due to the success of targeted promotions and focus on higher-value loading were offset by the effects of the economic slowdown, particularly in Alberta, and heightened competitive intensity. Our monthly postpaid subscriber churn rate was 0.95% in 2016, as compared to 0.94% in 2015. (See *Section 5.4 Wireless segment* for additional details.)

Net additions of high-speed Internet subscribers were 68,000 in 2016, down 23,000 from 2015. The decrease resulted from the effects of heightened competitive intensity and the impact of the economic slowdown in Alberta, resulting in increased churn, partly offset by growth in the areas of continued expansion of our high-speed broadband footprint, including fibre to the premises (FTTP) and the pull-through impact from the continued adoption of Optik TV. Net additions of TELUS TV subscribers were 54,000 in 2016, down 35,000 from 2015. The decrease reflects lower gross additions, a higher customer churn rate and a decline in satellite-TV subscribers due a declining overall market for paid TV services resulting from the economic slowdown in Alberta, a high rate of market penetration and the effects of heightened competitive intensity including OTT services. These pressures were partly offset by the continued focus on expanding our addressable high-speed Internet and Optik TV footprint, connecting more homes and business directly to fibre, and bundling these services together. This contributed to combined Internet and TV subscriber growth of 122,000 or 4.7% in 2016. (See *Section 5.5 Wireline segment* for additional details.)

- **Operating income** decreased by \$171 million in 2016, primarily due to the effects of the \$305 million transformative compensation expense recorded in the fourth quarter of 2016, as well as increases in Depreciation and amortization expenses.

EBITDA includes restructuring and other costs, such as the \$305 million transformative compensation expense recorded in other costs in the fourth quarter of 2016. EBITDA also includes net gains and equity income related to real estate joint venture developments recorded in the second, third and fourth quarters of 2016, and a gain from the exchange of wireless spectrum licences recorded in the second quarter of 2016. EBITDA decreased by \$33 million in 2016.

Adjusted EBITDA excludes restructuring and other costs, the net real estate gains and equity income, and the gain from the exchange of wireless spectrum licences, noted above. Adjusted EBITDA increased by \$179 million in 2016 due to: growth in wireline data revenues and wireless network revenue; improvements in Internet, business process outsourcing, TELUS TV and TELUS Health margins; and the execution on our operational efficiency and effectiveness initiatives. This growth was partly offset by higher wireless acquisition and retention costs, continued declines in legacy wireline voice revenues, certain business acquisition-related provisions, and approximately \$5 million of costs and revenue impacts, predominantly in wireline, related to the severe wildfires in northern Alberta. Had 2015 adjusted EBITDA also excluded the non-recurring gain on certain real estate assets in the fourth quarter of 2015, adjusted EBITDA would have reflected an increase of approximately \$199 million or 4.5% in 2016. (See *Section 5.4 Wireless segment* and *Section 5.5 Wireline segment* for additional details.)

- **Income before income taxes** decreased by \$244 million in 2016, reflecting lower Operating income as noted above, and an increase in Financing costs. The increase in Financing costs resulted from higher average long-term debt outstanding (including the full-year impact of increased debt related to the purchase of spectrum licences in 2015), higher foreign exchange losses and a decrease in interest income related to the settlement of prior years’ income tax-related items. These were partly offset by a lower weighted average cost of long-term debt, lower employee defined benefit plans net interest and higher capitalized long-term debt interest costs for spectrum licences not yet able to be deployed. (See *Financing costs* in *Section 5.3*.)
- **Income taxes** decreased by \$98 million in 2016, primarily due to lower Income before income taxes, the revaluation of deferred income tax liabilities in 2016 to reflect the provincial income tax rate reduction in Quebec beginning in 2017, and a \$48 million increase in deferred taxes in the second quarter of 2015 to revalue deferred income tax liabilities arising from an increase in the Alberta provincial corporate tax rate, partly offset by lower recoveries related to the settlement of prior years’ income tax-related matters (excluding related interest income).

- **Net income attributable to Common Shares** decreased by \$159 million in 2016, reflecting lower Operating income and increased Financing costs, partly offset by lower Income taxes. Excluding restructuring and other costs, income tax-related adjustments, the net gains and equity income from real estate joint venture developments in 2016, the gain on the exchange of wireless spectrum licences in 2016 and the asset retirement from the closure of Black’s Photography retail stores in 2015, adjusted Net income decreased by \$27 million or 1.7% for the full year of 2016.

Analysis of Net income

Years ended December 31 (\$ millions)	2016	2015	Change
Net income attributable to Common Shares	1,223	1,382	(159)
Add back (deduct):			
Restructuring and other costs, after income taxes	351	166	185
(Favourable) unfavourable income tax-related adjustments	(17)	1	(18)
Net gains and equity income from real estate joint venture developments, after income taxes	(16)	—	(16)
Gain on the exchange of wireless spectrum licences, after income taxes	(13)	—	(13)
Asset retirement from closure of Black’s Photography, after income taxes	—	6	(6)
Adjusted net income	1,528	1,555	(27)

- **Basic EPS** decreased by \$0.23 or 10.0% in 2016. The effect of fewer shares outstanding resulting from our NCIB program, net of share option exercises, contributed positively to basic EPS by approximately \$0.03 in 2016. Excluding the effects of restructuring and other costs, income tax-related adjustments, net gains and equity income from real estate joint venture developments, the gain on the exchange of wireless spectrum licences and asset retirement from the closure of Black’s Photography retail stores, basic EPS remained unchanged.

Analysis of basic EPS

Years ended December 31 (\$)	2016	2015	Change
Basic EPS	2.06	2.29	(0.23)
Add back (deduct):			
Restructuring and other costs, after income taxes, per share	0.60	0.28	0.32
Unfavourable (favourable) income tax-related adjustments, per share	(0.03)	—	(0.03)
Net gains and equity income from real estate joint venture developments, after income taxes, per share	(0.03)	—	(0.03)
Gain on the exchange of wireless spectrum licences, after income taxes, per share	(0.02)	—	(0.02)
Asset retirement from closure of Black’s Photography, after income taxes, per share	—	0.01	(0.01)
Adjusted basic EPS	2.58	2.58	—

- **Dividends declared per Common Share** totalled \$1.84 in 2016, up 9.5% from 2015. On February 8, 2017, the Board declared a first quarter dividend of \$0.48 per share on the issued and outstanding Common Shares, payable on April 3, 2017, to shareholders of record at the close of business on March 10, 2017. The first quarter dividend increased by \$0.04 per share or 9.1% from the \$0.44 per share dividend declared one year earlier, consistent with our multi-year dividend growth program described in *Section 4.3 Liquidity and capital resources*.

Liquidity and capital resource highlights

- **Net debt to EBITDA – excluding restructuring and other costs** was 2.69 times at December 31, 2016, up from 2.66 times at December 31, 2015, as the increase in net debt was largely offset by growth in EBITDA – excluding restructuring and other costs. (See *Section 4.3 Liquidity and capital resources* and *Section 7.5 Liquidity and capital resource measures*.)
- **Cash provided by operating activities** decreased by \$337 million in 2016 due to increases in income taxes paid, interest paid and restructuring and other disbursements, of which the most significant component related to transformative compensation payments. These factors were partly offset by growth in EBITDA – excluding restructuring and other costs and lower share-based compensation payments.
- **Cash used by investing activities** decreased by \$1.55 billion or 35% in 2016, mainly due to lower expenditures for spectrum licences, partly offset by higher capital expenditures. **Payments for spectrum licences** decreased by \$1.9 billion in 2016, largely due to our participation in wireless spectrum auctions held by ISED in 2015. **Capital expenditures** (excluding spectrum licences) increased by \$391 million in 2016, mainly due to generational capital investments in broadband infrastructure and deploying 700 MHz and 2500 MHz spectrum licences. Investments in our broadband infrastructure include our fibre-optic network, which supports our small-cell technology strategy to improve coverage and prepare for a more efficient and timely evolution to 5G, as well as connect more homes and businesses directly to our fibre-optic network. (See *Section 7.3 Cash used by investing activities*.)

- **Cash used by financing activities** was \$87 million in 2016, as compared to **Cash provided by financing activities** of \$1.1 billion in 2015. The \$1.2 billion net increase in cash used by financing activities was mainly due to lower net issues of long-term debt in 2016, partly offset by lower purchases of shares under the NCIB program. (See *Section 7.4 Cash provided (used) by financing activities*.)
- **Free cash flow** decreased by \$937 million in 2016, resulting from the \$391 million increase in capital expenditures (excluding spectrum licences), increased payments in respect of restructuring and other costs, and increases in income taxes paid and interest paid, partially offset by growth in EBITDA – excluding restructuring and other costs. (See calculation in *Section 11.1 Non-GAAP and other financial measures*.)

1.4 Performance scorecard (key performance measures)

In 2016, we achieved three of four original consolidated targets and all of our original segment targets, missing only the target for capital expenditures. In respect of updated guidance provided for five targets with our second quarter results, we achieved the revised target for consolidated revenue, consolidated EBITDA – excluding restructuring and other costs, and wireless segment EBITDA – excluding restructuring and other costs. We did not achieve the revised guidance for capital expenditures or wireline external revenue. Our original targets were announced on February 11, 2016.

We achieved our consolidated revenue target primarily due to growth in wireless network revenue, which exceeded the high end of our target range. Wireless network revenue growth resulted from higher than expected average revenue per subscriber unit per month (ARPU) (driven by increased data usage) and growth in our subscriber base. Wireline revenues were slightly below the revised bottom end of our target range due to slower than anticipated growth in data revenues, continued declines in legacy voice services and lower business spending than expected in the second half of 2016.

We met our target for consolidated EBITDA – excluding restructuring and other costs. Our target for wireless EBITDA – excluding restructuring and other costs was met due to an increase in network revenue and executing on operational efficiency and effectiveness initiatives, partially offset by higher acquisition and retention spending. Our target for wireline EBITDA – excluding restructuring and other costs was met due to executing on our efficiency and effectiveness initiatives and improved margins in enhanced data services, TELUS TV services, business process outsourcing services and TELUS Health services.

Our basic EPS of \$2.06 for 2016 included the effect of the transformative compensation expense recorded in other costs of \$0.38 in the fourth quarter of 2016; however, the target for basic EPS did not include this expense. When the effects of the transformative compensation expense are excluded from basic EPS, we met our target range.

Our capital expenditures in 2016 exceeded both our original target and revised guidance, as we continued to focus on investments in broadband infrastructure, including our fibre-optic network, as well as deployment of 700 MHz and 2500 MHz spectrum licences. Investments in our broadband infrastructure also support our small-cell technology strategy to improve coverage and prepares for a more efficient and timely evolution to 5G.

Our capital structure financial policies and our report on financing and capital structure management plans are described in *Section 4.3 Liquidity and capital resources*.

The following scorecard compares TELUS’ performance to our original 2016 targets. See our general trends, outlook and assumptions for 2017 in *Section 9*.

Scorecard

	2016 performance		
	Actual results and growth	Original or revised targets ⁴ and growth	Result
Consolidated			
Revenues	\$12.799 billion 2.4%	\$12.775 to \$12.875 billion ^{4a} 2.2 to 3.0%	✓
EBITDA – excluding restructuring and other costs ¹	\$4.708 billion 4.9%	\$4.650 to \$4.755 billion ^{4b} 3.6 to 6.0%	✓
Basic EPS	\$2.06 (10.0)%	—	—
Basic EPS ²	\$2.44 6.6%	\$2.40 to \$2.56 5.0 to 12.0%	✓
Capital expenditures ³	\$2.968 billion	Approx. \$2.85 billion ^{4c}	X
Wireless segment			
Network revenue (external)	\$6.541 billion 3.9%	\$6.425 to \$6.490 billion 2.0 to 3.0%	✓
EBITDA – excluding restructuring and other costs	\$3.027 billion 4.8%	\$3.000 to \$3.060 billion ^{4d} 3.9 to 6.0%	✓
Wireline segment			
Revenue (external)	\$5.684 billion 2.1%	\$5.705 to \$5.735 billion ^{4e} 2.4 to 3.0%	X
EBITDA – excluding restructuring and other costs	\$1.681 billion 5.1%	\$1.650 to \$1.695 billion 3.0 to 6.0%	✓

Met target ✓; Missed target X.

1 See description in *Section 11.1 Non-GAAP and other financial measures*.

2 Our target for basic EPS excluded the transformative compensation of \$0.38 per share recorded in other costs in the fourth quarter of 2016; actual results adjusted to exclude the transformative compensation expense.

3 Excludes expenditures for spectrum licences.

4 Targets were revised in the second quarter of 2016 to reflect improved performance in wireless and wireline, and the general positive environment for generational capital investments in broadband infrastructure.

4a The original target for Consolidated revenues was \$12.750 to \$12.875 billion, or an increase of 2.0 to 3.0%.

4b The original target for Consolidated EBITDA – excluding restructuring and other costs was \$4.625 to \$4.755 billion, or an increase of 3.0 to 6.0%.

4c The original target for Capital expenditures was \$2.65 billion.

4d The original target for wireless segment EBITDA – excluding restructuring and other costs was \$2.975 to \$3.060 billion, or an increase of 3.0 to 6.0%.

4e The original target for wireline segment external revenue was \$5.680 to \$5.735 billion, or an increase of 2.0 to 3.0%.

We made the following key assumptions when we announced the 2016 targets in February 2016.

Assumptions for 2016 targets and results

- Our economic assumptions are based on a composite of estimates from Canadian banks and other sources. Our original assumptions for 2016 were: (i) moderately higher economic growth in Canada of 1.7%, up from an estimated 1.1% in 2015; (ii) for our incumbent local exchange carrier (ILEC) provinces in Western Canada, economic growth in B.C. in the range of 2.0% to 2.5% and economic growth in Alberta in the range of 0.5% to 1.0%, in part due to low oil prices.

In our MD&A for the first quarter of 2016, we revised our 2016 economic growth (contraction) assumptions to 1.4% for Canada, 2.5% for B.C. and (1.0) to (1.5)% for Alberta. In our MD&A for the second quarter of 2016, we further revised our 2016 economic growth (contraction) assumptions to 1.3% for Canada, 2.9% for B.C. and (2.0)% for Alberta, in part due to the Fort McMurray wildfires. In our MD&A for the third quarter of 2016, we again revised our 2016 economic growth (contraction) assumptions to 1.2% for Canada, 2.8% for B.C. and (2.2)% for Alberta.

We estimate that economic growth for 2016 was 1.2% for Canada and 2.9% for B.C., while the contraction in Alberta was (2.4)%.

- Our original assumption for restructuring and other costs was approximately \$175 million for continuing operational efficiency initiatives. The assumption for other costs did not include the \$305 million transformative compensation expense recorded in the fourth quarter of 2016.
- Our assumption was for stable wireless acquisition and retention expenses, as compared to 2015, dependent on gross loadings, market pressures and the continued impact of the coterminous expiration of two-year and three-year plans, which began in June 2015. Both acquisition and retention expenses increased in 2016 from heightened competitive intensity, resulting in higher subsidy rates.

Confirmed:

- No material adverse regulatory rulings or government actions.
- Continued intense wireless and wireline competition in both consumer and business markets.
- An increase in wireless industry penetration of the Canadian market, consistent with 2015.
- Ongoing subscriber adoption of, and upgrades to, data-intensive smartphones, as customers want more mobile connectivity to the Internet.
- Wireless revenue growth resulting from modest growth in both postpaid subscriber loadings and blended ARPU.
- Continued growth in wireline data revenue, resulting from an increase in high-speed Internet and Optik TV subscribers, speed upgrades and expanding broadband infrastructure, as well as business outsourcing and healthcare solutions.
- Continued focus on our customers first initiatives and maintaining our customers’ likelihood-to-recommend scores. See *Section 3 Corporate priorities*.
- Pension plans: Defined benefit pension plan expense of approximately \$89 million recorded in Employee benefits expense and approximately \$5 million recorded in employee defined benefit plans net interest in Financing costs; a 4.00% discount rate for employee defined benefit pension plan accounting purposes (2015 – 3.90%); and defined benefit pension plan funding of approximately \$57 million. Actual results were: \$92 million recorded in Employee benefits expense, \$6 million recorded in employee defined benefit plans net interest, a discount rate of 4.00% and defined benefit pension plan funding of \$70 million.
- Income taxes: Income taxes computed at applicable statutory rate of 26.3 to 26.8% and cash income tax payments between \$570 million and \$630 million (2015 – \$256 million). Actual results were a statutory income tax rate of 26.7% and cash income tax payments of \$600 million.
- Increased investments in broadband infrastructure, including our new fibre-optic network, and 4G LTE expansion and upgrades, as well as in network and systems resiliency and reliability.
- A continuing weakness in the average Canadian dollar to U.S. dollar exchange rate from the U.S. 78 cent average exchange rate in 2015. The average exchange rate for 2016 was U.S. 75.5 cents.

2. Core business and strategy

2.1 Core business

We provide a wide range of telecommunications products and services. Wireless products and services include network revenue (data and voice) and equipment sales arising from mobile technologies. Wireline products and services include data revenues (which include revenues from Internet protocol; television; hosting, managed information technology and cloud-based services; business process outsourcing; and certain healthcare solutions), voice revenues and other telecommunications services revenues. We earn the majority of our revenue from access to, and the usage of, our telecommunications infrastructure, and from providing services and products that facilitate access to, and usage of, our infrastructure.

2.2 Strategic imperatives

Since 2000, we have maintained a proven national growth strategy. Our strategic intent is to unleash the power of the Internet to deliver the best solutions to Canadians at home, in the workplace and on the move. Our focus is on our core telecommunications business in Canada, supported by our international contact centres and outsourcing capabilities.

We developed six strategic imperatives in 2000 that remain relevant for future growth, despite changing regulatory, technological and competitive environments. We believe that a consistent focus on these imperatives guides our actions and contributes to the achievement of our financial goals. To advance these long-term strategic imperatives and address near-term opportunities and challenges, we also set new corporate priorities each year, as further described in *Section 3*. Our six strategic imperatives are listed below, together with a discussion of the 2016 activities and initiatives that relate to each of them.

Focusing relentlessly on growth markets of data, IP and wireless

In 2016, approximately 87% of TELUS consolidated revenues were external wireless revenues and wireline data revenues (86% in 2015). These combined revenues increased by \$469 million to \$11.2 billion in 2016, compared to 2015. In contrast, wireline voice and other revenues, including wireline Other operating income, decreased by \$172 million to \$1.6 billion in 2016. (See the consolidated revenue trend discussion in *Section 5.2* and segment trend discussions in *Section 5.4* and *Section 5.5*.)

Providing integrated solutions that differentiate TELUS from our competitors

On March 1, 2016, we launched new Lite basic TV plans on both our Optik and satellite-TV services, offering another choice to customers looking for basic channel services at lower prices. These new plans, as well as our existing offers of small theme packs, align with the intent of the Canadian Radio-television and Telecommunications Commission (CRTC) to provide greater customer choice and provide more freedom for Canadian viewers to subscribe to the channels they want to watch. Even prior to the commencement of the CRTC’s consultation on the television regulatory framework in 2014, we began focusing on providing TV service plans that more closely reflect the demands of our customers, rather than larger programming packages with higher aggregate prices.

Building national capabilities across data, IP, voice and wireless

In May 2016, we concluded a spectrum licence assignment and rationalization agreement with Xplornet Communications Inc., a Canadian-based broadband Internet provider. Under this agreement, we transferred 3500 MHz fixed wireless access spectrum licences in certain of our secondary and tertiary regions, as well as monetary consideration, in exchange for Xplornet’s 2300 MHz spectrum licences in similar regions. The associated spectrum licence transfer application was approved by Innovation, Science and Economic Development Canada (ISED) on April 21, 2016. This spectrum licence exchange will allow for more robust mobile and fixed wireless broadband access for Canadians, as each party in the transaction can more effectively utilize these licences within its respective network. The 2300 MHz spectrum has a robust ecosystem of network infrastructure and devices, and complements our existing 2300 MHz spectrum holdings in Montreal, Quebec City and key markets in Western Canada, giving us use of the spectrum in this band in nearly every market.

Consistent with our network optimization strategy, we exchanged certain wireless telecommunication tower sites in 2016 with Bell Mobility. The exchange entailed the re-assignment of existing lease agreements for each tower site, as well as the transfer of all ownership of any leasehold construction on the leased premises, including tower structures, antennae and cabling. The exchange benefits both parties, as the tower sites are well positioned for utilization within each party’s respective 4G long-term evolution (LTE) network footprint. We expect that additional transfers of assets will be made in 2017.

Partnering, acquiring and divesting to accelerate the implementation of our strategy and focus our resources on core business

In February 2016, we partnered with Microsoft and Avanade, a leading global provider of innovative digital business and technology services in the Microsoft ecosystem, to offer Skype for Business. Powered by TELUS, Skype for Business offers a full suite of enterprise-grade communication and collaboration tools that includes voice and video calls, instant messaging and online meetings. This service is delivered as a fully managed private cloud solution over our network of intelligent Internet data centres located across Canada, and is available through a single interface on almost all devices.

In March 2016, the Canada Green Building Council awarded leadership in energy and environmental design (LEED) platinum certification to the TELUS Garden™ office tower in Vancouver. This is the highest LEED rating a building can receive, demonstrating our commitment to technological innovation and environmental stewardship. In partnership with Westbank Projects Corp., the one-million-square-foot TELUS Garden development includes 450,000 square feet of office space, 65,000 square feet of retail space, and a 53-storey residential tower that was officially opened in June 2016. Following the opening of the residential tower, the TELUS Garden real estate joint venture commenced the transfer of ownership to the majority of condominium unit owners, as well as the recognition of the associated sales revenue concurrent with repatriation of funds from the joint venture, including the repayment of the construction credit facility. The remaining ownership transfers and associated sales revenue are expected to be recorded in 2017.

As discussed in *Section 1.3*, in June 2016, we announced the completion of the investment by Baring Asia in TELUS International. Also discussed in *Section 1.3*, in May 2016, we announced an agreement with BCE, pursuant to which we would acquire a portion of Manitoba Telecom Services Inc.’s (MTS’) postpaid wireless subscribers and dealer locations in Manitoba, dependent on the successful completion of BCE’s acquisition of MTS. As of February 9, 2017, BCE had not received the requisite approvals from the Competition Bureau and ISED.

Going to market as one team under a common brand, executing a single strategy

Our team works together to implement our top corporate priority: putting customers first, as we strive to consistently deliver exceptional client experiences and become the most recommended company in the markets we serve. The November 2016 report of the office of the Commissioner for Complaints for Telecommunications Services (CCTS) for the 12-month period ended July 31, 2016 showed the successful result of this strategy. Once again, TELUS was the subject of the lowest number of customer complaints among all national carriers. TELUS, Koodo® and Public Mobile were the subjects of 7.0%, 2.5% and 0.6% of the total customer complaints submitted to the CCTS, respectively, or 10.1% of total customer complaints in aggregate. In addition, we recorded the lowest postpaid churn among our peers of 0.95% in 2016.

Investing in internal capabilities to build a high-performance culture and efficient operation

Our transformative compensation was paid in connection with changes to certain premium payments and paid time-off provisions that will underpin future productivity improvements. As a result of these changes, we expect to realize savings over the coming years. See *Collective bargaining and transformative change compensation* in *Section 1.3*.

3. Corporate priorities

We confirm or set new corporate priorities each year that are intended to both advance TELUS’ long-term strategic imperatives (see *Section 2.2*) and address near-term opportunities and challenges. The following table provides a discussion of activities and initiatives that relate to our 2016 corporate priorities.

Delivering on TELUS’ future friendly[®] brand promise by putting customers first, enhancing reliability, and pursuing global leadership in the likelihood of our clients to recommend our products, services and people

- We launched the TELUS Internet for Good pilot project, which offers low-cost Internet service to as many as 33,000 low-income, single-parent families in British Columbia and Alberta, and is entirely funded by TELUS with no cost to either governments or taxpayers. As part of the program, participants also receive access to TELUS WISE[®], our national Internet and smartphone safety program, as well as access to a low-cost computer, digital literacy programs and music education resources from The Royal Conservatory.
- We maintained our leadership position in customer loyalty, achieving a postpaid wireless churn rate of less than one per cent for 13 of the last 14 quarters. Notably, in two J.D. Power studies, Koodo was ranked “Highest in customer service among wireless providers” in the 2016 Canadian Wireless Customer Care Study and TELUS received “Highest wireless network quality performance in Ontario” two years in a row in the 2016 Canadian Wireless Network Quality Study.
- TELUS came in first place among all Canadian wireless carriers for speed and responsiveness (latency) in Open Signal’s January 2017 report, “State of Networks: Canada.” This result is testament to our multi-pronged strategy for technology development, such as through our rollout of LTE, our wireless network upgrade in Eastern Canada and our approach to the roll out of 5G by incubating new technologies through trials in a real life environment in our 5G Living Lab in Vancouver.
- We continued to exceed our business targets in respect of likelihood-to-recommend results and we lead our national peers in the consumer space, with Koodo being the most recommended of any wireless brand.
- We continued to revitalize our corporate retail locations, opening 91 new Digital Life stores and five new Connected Experience stores, bringing the total number for each store format to 100 and seven, respectively, at year end. Digital Life stores contain accessories and connected life products with compelling merchandising. The Connected Experience stores are larger format stores in key shopping malls that offer premium lifestyle, health and home products, along with TELUS Learning Centres, where team members can take customers through one-on-one demos.
- We introduced TELUS Internet 150/150, our advanced 150 Mbps Internet plan that uniquely offers symmetrical download and upload speeds of up to 150 Mbps to both consumers and business customers on the TELUS PureFibre™ network. None of our cable-TV competitors currently offer comparable symmetrical upload speed of 150 Mbps.
- We launched Premium Plus wireless offers – allowing customers to get more affordable high-end devices, which results in a greater subsidy but higher average revenue per subscriber unit per month (ARPU) over time.
- We launched Optik TV 4K in mid-2016 and were the first carrier in Western Canada to offer 4K programming to customers with an Optik TV 4K set-top box. Those customers who also have a Netflix Premium subscription can stream Netflix 4K content directly through their 4K set-top box.

Elevating our winning culture for sustained competitive advantage, with the world’s most engaged team

- We reached three new collective agreements that provide labour stability and operational flexibility benefiting our customers, team members and the Company for the long term.
- Our employee engagement levels continue to place our organization within the top quartile of all employers surveyed.
- Our culture continues to fuel our success in the marketplace, as we focus on putting our customers first in a manner that differentiates us from our competitors.
- Our Work Styles[®] program saw nearly 70% of eligible team members work outside TELUS offices at least part of the week.
- TELUS was named one of Canada’s Top 100 Employers and one of Canada’s Best Diversity Employers for the eighth consecutive year.
- In 2016, TELUS and its team members contributed \$43 million to charitable organizations across Canada and around the world, and volunteered 870,000 hours.
- We formed the TELUS Manitoba Community Board, which will launch in early 2017 and will provide funding to local registered charities that support youth and families, focused on at least one of three key areas: health, education and the environment. We also formed the TELUS International Romania Community Board, which will launch in 2017 and will focus on supporting youth in the same key areas. TELUS now has 17 Community Boards around the world.
- We received our 11th BEST award for excellence in employee learning and development from the Association for Talent Development and we are the only organization inducted into the Best of the BEST Hall of Fame.

Continuing to enhance our operational efficiency, effectiveness and reliability

- We continued to enhance our leading technology while driving process improvements, contributing to significant improvements in network and systems availability. Notably, we have achieved year-over-year reductions of up to 60% in downtime, resulting in marked increases in reliability for our customers.
- To meet our customers’ growing needs, we introduced numerous product and system innovations, including the next generation sales system in our retail channel and the expansion of Easy Roam[®] for our mobile customers on a global basis.
- We completed a significant efficiency program initiated in the fourth quarter of 2015, which resulted in a net reduction of approximately 1,500 full-time equivalent employees by the end of the second quarter of 2016. This efficiency initiative is expected to generate annual recurring savings of approximately \$125 million.
- As noted in *Section 1.3*, our immediately vesting transformative compensation paid in the fourth quarter of 2016 is expected to provide us with financial flexibility to make the necessary growth and customer retention investments within a competitive environment.
- We continue to invest in operational efficiency initiatives, including increased utilization of our TELUS International customer care, IT and business process services, incremental real estate rationalization, and various other efficiency and effectiveness programs, in support of our top priority of putting customers first while continuing to drive toward a more efficient cost structure.

Increasing our competitive advantage by expediting the build of reliable, client-centric networks and through technology leadership

- We partnered with our lead vendor and are conducting trials of 5G wireless technology in our 5G Living Lab in Vancouver. The successful advancements made in the lab are progressing our anticipated deployment of 5G technology by 2020.
- We continued to invest in our leading-edge broadband technology, which has enabled the success of Optik TV, Internet and business services, as well as the ongoing advancement of our world-class wireless networks:
 - Our 4G LTE network covers 97% of Canada’s population.
 - Our high-speed broadband coverage reaches more than 2.9 million households and businesses in B.C., Alberta and Eastern Quebec, including approximately 1.08 million homes and businesses covered by fibre-optic cable, up from 0.69 million homes and businesses in 2015, which now provides these premises with immediate access to our gigabit-capable fibre-optic network.
- We introduced our private, public and hybrid cloud offerings, which will help organizations to maximize their IT investments and achieve greater business agility.
- Our team rolled out voice over LTE (VoLTE) in select areas in B.C. and Alberta, allowing customers with compatible smartphones to make and receive calls faster over our 4G LTE network.
- As VoLTE is introduced across our network and is used by more customers, we will be in a position to turn down older technologies and redirect spectrum to support the LTE network.
- We made substantial investments in Eastern Quebec to improve network reliability.

Driving TELUS’ leadership position in our chosen business, public sector and international markets

- We positioned TELUS International, with the backing and support of TELUS and Baring Asia, to continue its significant growth in the years ahead. See *Investment in TELUS International in Section 1.3 Highlights of 2016*. TELUS invested the proceeds of approximately \$600 million from the transaction in our business such as the expansion and advancement of our broadband networks.
- Under a 10-year strategic partnership agreement with the Government of B.C. to provide it and its public sector partners with telecommunications and strategic services, by December 2016, we had extended wireless coverage along 1,720 km of primary and secondary provincial highways. Additionally, where TELUS was the prime contractor, we have upgraded service at 1,415 of 1,417 B.C. public schools from legacy networks to the province’s next generation network.
- The Groupe d’approvisionnement en commun de l’Est du Québec (Eastern Quebec joint procurement group) awarded TELUS a two-year contract to provide advanced LTE wireless technology to thousands of professionals working at health facilities and 35 universities and CEGEPs (a network of post-secondary educational institutions) throughout Quebec. The contract is valued at \$30 million, with a renewal option for two more years.

Advancing TELUS’ leadership position in healthcare information management

- In June 2016, we announced our intention to collaborate to improve communications among healthcare providers across Canada. In 2017, TELUS will launch a national, secure, standards-based, and open messaging solution that will allow its 20,000 Canadian physicians to communicate more effectively with each other and to physicians using other electronic medical records (EMR) platforms that choose to link to TELUS.
- In September 2016, TELUS acquired the Canadian business operations of Nightingale Informatix Corp., including its customer base and proprietary EMR software.
- We launched TELUS personal health records in Saskatchewan.
- We rolled out our TELUS Home Health Monitoring solution in B.C., as well as a pilot project of this solution in the Yukon.

Our 2017 corporate priorities are provided in the table below.

2017 corporate priorities

- Delivering on TELUS’ future friendly brand promise by putting customers first
- Elevating our winning culture for sustained competitive advantage, striving for world-leading team engagement to consistently delight our customers and giving compassionately to support improved social outcomes
- Generating profitable top-line revenue growth on a concerted basis while continuing to enhance our operational efficiency, effectiveness and reliability
- Increasing our competitive advantage by expediting the build of reliable, client-centric networks and systems and through technology leadership
- Driving TELUS’ leadership position in our chosen business, public sector and international markets
- Advancing TELUS’ leadership position in healthcare information management.

4. Capabilities

4.1 Principal markets addressed and competition

<p>Wireless products and services for consumers and businesses across Canada</p> <p>Our products and services</p> <ul style="list-style-type: none"> • Data and voice – Fast Internet access for video, social networking, messaging and mobile applications, including Optik® on the go; Internet of Things (IoT) solutions (including machine-to-machine (M2M) connectivity); clear and reliable voice services; push-to-talk (PTT) solutions, including TELUS Link™ service; and international roaming. • Devices – The latest smartphones, tablets, mobile Internet keys, mobile Wi-Fi devices, M2M modems, digital life devices and wearable technology. <p>Our capabilities</p> <ul style="list-style-type: none"> • Licensed gross national wireless spectrum holdings averaging 160.4 MHz. • Coast-to-coast digital 4G LTE network, first launched in major centres in February 2012: <ul style="list-style-type: none"> • Overall coverage of 97% of Canada’s population, with the LTE advanced portion of the network covering 74% of Canada’s population, at December 31, 2016. Coverage includes roaming agreements. • Coverage and capacity were enhanced with the deployment of the 700 MHz wireless spectrum licences acquired in 2014 and the deployment of the 2500 MHz wireless spectrum acquired in 2015. We plan to utilize other spectrum licences purchased in recent years in combination with unlicensed supplementary spectrum, as network and device ecosystems evolve. • Manufacturer-rated peak data download speeds of up to 110 Mbps on the LTE network (typical speeds of 12 to 45 Mbps expected with a compatible device).¹ • Manufacturer-rated peak data download speeds of up to 225 Mbps on the LTE advanced portions of the network (typical speeds of 12 to 65 Mbps expected with a compatible device).¹ • Reverts to the HSPA+ network and speeds when customers are outside LTE coverage areas. • Coast-to-coast digital 4G HSPA+ network, launched in November 2009: <ul style="list-style-type: none"> • Coverage of 99% of Canada’s population, with typical speeds of 4 to 14 Mbps with a compatible device.¹ • International voice and data roaming capabilities in more than 225 countries. • Suite of IoT solutions to support Canadian businesses locally and internationally, including asset tracking, fleet management, remote monitoring, digital signage and security. <p>Competition overview</p> <ul style="list-style-type: none"> • Facilities-based national competitors Rogers Wireless and Bell Mobility, as well as provincial or regional telecommunications companies SaskTel, MTS (pending its acquisition by BCE), Eastlink, Videotron, Tbaytel and Shaw Communications’ Freedom Mobile (formerly Wind Mobile). • Fixed wireless services. • Resellers of competitors’ wireless networks. • Services offered by cable-TV and wireless competitors over wireless and metropolitan Wi-Fi networks. <p>¹ Actual speed may vary based on device being used, geographical topography and environmental conditions, network congestion, signal strength and other factors.</p>
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Wireline products and services: Residential services in British Columbia, Alberta and Eastern Quebec; healthcare solutions; business services across Canada; and contact centre and outsourcing solutions offered internationally

Our products and services

- Voice – Reliable fixed phone service with long distance and advanced calling features; voice over IP (VoIP) supporting voice services into the future.
- Internet – Fixed high-speed Internet access (HSIA) service with email and a comprehensive suite of security solutions. Also includes HSIA over LTE and TELUS PureFibre™, with reliable Wi-Fi, and cloud storage. Only provider in Western Canada offering symmetrical 150 Mbps download and upload speeds.
- TELUS TV – High-definition entertainment service with Optik TV and TELUS Satellite TV. Optik TV offers extensive content options and innovative features such as PVR Anywhere, Remote Recording, Optik Smart Remote channel browsing with a tablet or smartphone, and Optik on the go. TELUS Satellite TV service is offered only in B.C. and Alberta by way of an agreement with Bell Canada. Only provider in Western Canada offering 4K TV capability.
- IP networks and applications – Converged voice, video and data services and Internet access, offered on a high-performing network.
- Contact centre, business process and IT outsourcing solutions in more than 30 languages – Managed solutions providing low-cost and scalable infrastructure in North America, Central America, Europe and Asia.
- Hosting, managed IT and cloud-based services – Cybersecurity and other solutions with ongoing assured availability of telecommunications, networks, servers, databases, files and applications, with critical applications stored in our Internet data centres (IDCs) across Canada.
- Healthcare – TELUS Health’s proprietary technology, including pharmacy management, electronic medical records, electronic health records, remote patient monitoring and online settlement claims management solutions.
- Conferencing and collaboration – Full range of equipment and application solutions to support meetings and webcasts by means of phone, video and Internet.

Our capabilities

- Ongoing connection of homes and businesses directly to fibre-optic cables; now over one million homes and businesses addressable by PureFibre in B.C., Alberta and Eastern Quebec.
- An IP-based national network overlaying an extensive switched network in B.C., Alberta and Eastern Quebec, as well as global interconnection arrangements.
- Eight data centres in six communities directly connected to the national TELUS IP network, creating an advanced and regionally diverse computing infrastructure in Canada.
- Wireline residential access line services provided to an estimated 34% of households in B.C. and Alberta, and 60% of households in our Eastern Quebec region.
- Access to businesses across Canada through our networks, as well as competitive local exchange carrier status.
- ADSL2+ or VDSL2 coverage reaching more than 2.9 million homes and businesses in B.C., Alberta and Eastern Quebec.
- Broadcasting distribution licences allowing us to offer digital television services in incumbent territories, as well as licences to offer commercial video-on-demand services.
- Business process outsourcing services with global delivery capabilities through our multi-national, multi-language programs, supported by approximately 25,750 full-time equivalent (FTE) employees across North America, Central America, Europe and Asia, as at December 31, 2016.
- Technology solutions to assist healthcare providers, consumers, health regions, hospitals, insurers and employers.

Competition overview

- Substitution of wireless services, including our own wireless offerings, for residential local and long distance services. The percentage of households with wireless-only telephone services (among all providers, including TELUS) is estimated to be 41% in B.C. and Alberta, and 16% in Eastern Quebec.
- Bell Canada, MTS (pending its acquisition by BCE), Rogers Communications, Shaw Communications, and Videotron (in Quebec).
- Allstream Inc., a national telecommunications service provider for business customers, owned by Zayo Group Holdings Inc., a U.S.-based provider of communications infrastructure services.
- Cable-TV competitors for Internet and entertainment services, such as Shaw Communications (in B.C. and Alberta) and Cogeco Cable and Videotron (in Eastern Quebec).
- Various others that offer resale or voice over IP-based (VoIP-based) local, long distance and Internet services.
- Over-the-top (OTT) voice and entertainment services, such as Skype and Netflix.
- Satellite-based entertainment and Internet services offered by Bell Canada, Shaw Communications and Xplornet.
- Competitors for contact centre services, such as Convergys, Sykes and Verizon LiveSource.
- Fixed wireless services.
- Customized managed outsourcing solutions competitors, such as system integrators CGI Group Inc., EDS division of HP Enterprise Services and IBM.
- Competitors for TELUS Health include providers of EMR and pharmacy management products, such as Omnimed, Familiprix, Kroll, Fillware and ARI. Competitors also include systems integrators, health service providers, such as Loblaws and McKesson that have also become vertically integrated and own a mix of health services delivery, IT solutions and related services, and potentially, global providers such as ATEB that could achieve expanded Canadian footprints.

4.2 Operational resources

Resources

Our team

- Approximately 51,250 employees at the end of 2016 (approximately 50,475 FTE employees across a wide range of operational functions, with 24,725 FTE employees in Canada and 25,750 FTE employees internationally).
- Approximately 10,950 of our employees are covered by collective agreements. The agreement with the Telecommunications Workers Union (TWU), United Steel Workers Local Union 1944, which covers 9,500 employees, expires on December 31, 2021. The agreement with the Syndicat des agents de maîtrise de TELUS (SAMT), which covers 760 team members in the TELUS Quebec region, expires on March 31, 2022. The agreement with the Syndicat québécois des employés de TELUS (SQET), which covers 630 employees, expires on December 31, 2022.
- Operations at Canadian and international locations to support contact centres and business process outsourcing services for external wholesale customers, as well as for certain functions internally.
- Employee compensation programs that support a high-performance culture and contain market-driven and performance-based components (bonus and share-based compensation) to attract and retain key employees.
- Succession plans to cover ongoing retirement, ready access to labour in Canada and, for contact centres and specific support functions, in various international locations. We also use external contractors and consultants.
- Training, mentoring and development programs to maintain and improve employee engagement levels and enhance the customer experience.

Resources

Our brand and distribution channels

- A well-established and recognizable national brand (TELUS, the future is friendly®).
- Koodo Mobile® – A national provider of postpaid and prepaid wireless voice and data services with a broad distribution network, including TELUS-owned stores, dealers and third-party electronics retailers.
- Public Mobile – Offers a prepaid wireless service, with a web-based distribution channel, and provides customers with a SIM-only service.
- Optik TV brand, launched in mid-2010.
- Our sales and support distribution channels:
 - Wireless services are supported through a broad network of TELUS-owned and branded stores, including our 50% ownership of the kiosk channel WOW! Mobile, an extensive distribution network of exclusive dealers and large third-party electronics retailers (e.g. Best Buy, WalMart and London Drugs) and a white label brand for a premier retail chain, as well as online self-serve applications, mass marketing campaigns and customer care telephone agents.
 - Wireline residential services are supported through TELUS-owned and branded stores, including third-party electronics retailers, as well as mass marketing campaigns, customer care telephone agents, and online and TV-based self-serve applications.
 - TELUS Health provides some of its consumer services – personal health records and home health monitoring – in partnership with provincial governments.
 - Business services, including healthcare, across wireless and wireline are supported through certain dedicated stores for business, TELUS sales representatives, product specialists, independent dealers and online self-serve applications for small and medium-sized businesses (SMBs). Business process outsourcing services are supported through sales representatives and client relationship management teams.
 - Dedicated direct-to-consumer channel of over 600 field sales agents.

Our technology, systems and properties

- TELUS is a highly complex technology-enabled company with a multitude of IT systems and processes.
- Broadcasting distribution licences for providing entertainment services.
- Our Intangible assets include wireless spectrum licences from Innovation, Science and Economic Development Canada (ISED), which are essential to providing wireless services.
- Network facilities are constructed under or along streets and highways, pursuant to rights-of-way granted by the owners of land, including municipalities and the Crown, or on freehold land owned by TELUS.
- Real estate properties (owned or leased) include administrative office space, work centres and space for telecommunications equipment. Some buildings are constructed on leasehold land and the majority of wireless towers are situated on lands or buildings held under leases or licences with varying terms. We also participate in two real estate re-development joint ventures. (See *Section 7.11*.)
- TELUS International provides customer care, IT and business process services by utilizing on-site facilities, including contact centre solutions, and by utilizing international data networks and data centres. Global rerouting capabilities and geographic diversity are supported by facilities located in North America, Central America, Europe and Asia.
- Through its proprietary technology, including pharmacy management, electronic medical records, electronic health records, remote patient monitoring and online settlement claims management software solutions, TELUS Health facilitates the integration of electronic health records from the home to the doctor’s office to the hospital, making critical health information available to healthcare providers over wireless and wireline broadband networks.

4.3 Liquidity and capital resources

Capital structure financial policies

Our objective when managing capital is to maintain a flexible capital structure that optimizes the cost and availability of capital at acceptable risk.

In the management of capital and in its definition, we include Common Share equity (excluding Accumulated other comprehensive income), Long-term debt (including long-term credit facilities, commercial paper backstopped by long-term credit facilities and any associated hedging assets or liabilities, net of amounts recognized in Accumulated other comprehensive income), Cash and temporary investments, and securitized trade receivables.

We manage our capital structure and make adjustments to it in light of changes in economic conditions and the risk characteristics of our telecommunications infrastructure. In order to maintain or adjust our capital structure, we may change the amount of dividends paid to holders of Common Shares, purchase shares for cancellation pursuant to our normal course issuer bid (NCIB) programs, issue new shares, issue new debt, issue new debt to replace existing debt with different characteristics and/or increase or decrease the amount of trade receivables sold to an arm’s-length securitization trust.

We monitor capital by utilizing a number of measures, including the net debt to EBITDA – excluding restructuring and other costs ratio and the dividend payout ratio. (See definitions in *Section 11.1.*)

Financing and capital structure management plans

Report on financing and capital structure management plans

Pay dividends to the holders of Common Shares under our multi-year dividend growth program

- In May 2016, we announced our intention to target ongoing semi-annual dividend increases, with the annual increase in the range of 7 to 10% from 2017 through to the end of 2019, thereby extending the policy first announced in May 2011. Notwithstanding this target, dividend decisions will continue to be subject to our Board’s assessment and the determination of our financial position and outlook on a quarterly basis. Our Board’s assessments have resulted in 12 semi-annual dividend increases from 2011 to 2016, with annual increases being approximately 10%. Our long-term dividend payout ratio guideline is 65 to 75% of prospective net earnings per share. Based on dividends announced as of February 8, 2017, and 590 million shares outstanding at December 31, 2016, dividend declarations would total approximately \$1.13 billion in 2017, before taking into account any Common Shares purchased and cancelled under our 2017 NCIB. There can be no assurance that we will maintain a dividend growth program through 2019. See *Section 10.7 Financing, debt requirements and returning cash to shareholders.*
- Dividends declared in 2016 totalled \$1.84 per share, an increase of 9.5% over 2015. On February 8, 2017, a first quarter dividend of \$0.48 per share was declared, payable on April 3, 2017, to shareholders of record at the close of business on March 10, 2017. The first quarter dividend for 2017 reflects a cumulative increase of \$0.04 per share or 9.1% from the \$0.44 per share dividend paid in April 2016.

Purchase of Common Shares under our multi-year NCIB

- On May 5, 2016, we announced our intention to renew our NCIB in each of the next three years in order to make purchases of our Common Shares for amounts of up to \$250 million in each calendar year. In September 2016, we received approval from the Toronto Stock Exchange (TSX) for a new 2017 NCIB to purchase and cancel up to 8 million Common Shares for consideration of up to \$250 million over a 12-month period, commencing September 30, 2016. TELUS will purchase Common Shares only when and if we consider it opportunistic, subject to any purchases that may be made under an automatic share purchase plan (ASPP). An employee benefit plan trust purchased the Common Shares paid to non-executive employees as part of the immediately vesting transformative compensation expense in the fourth quarter of 2016 and was permitted to do so under the NCIB. The employee benefit plan trust purchased and cancelled a nominal number of TELUS Common Shares for \$4 million as part of the 2017 NCIB.
- Share purchases under the 2017 NCIB represent up to 1.4% of outstanding Common Shares as of September 16, 2016. Such purchases may be made through the facilities of the TSX, the New York Stock Exchange (NYSE) and alternative trading platforms as may be permitted by applicable securities laws and regulations. Shares will be purchased only when and if we consider it opportunistic. There can be no assurance that we will complete our 2017 NCIB program or that we will renew and complete our NCIB program in each of the next two years, as any decision to purchase shares will depend on the assessment by our Board and the determination of the Company’s financial position and outlook, and the market price of TELUS Common Shares. See risk discussion in *Section 10.7 Financing, debt requirements and returning cash to shareholders.*
- Under the 2016 NCIB, which came into effect on September 15, 2015 and concluded on September 14, 2016, we purchased and cancelled 9,691,400 of our Common Shares for approximately \$380 million, reflecting an average share purchase price of \$39.14. The purchased and cancelled shares represented 1.6% of the Common Shares outstanding prior to commencement of the 2016 NCIB.
- We have also entered into an ASPP with a broker for the purpose of permitting us to purchase our Common Shares under our NCIB at times when we would not be permitted to trade in our shares, including regularly scheduled quarterly blackout periods. Such purchases will be determined by the broker in its sole discretion based on parameters that we established prior to any blackout period, in accordance with TSX rules and applicable securities laws. The ASPP has been approved by the TSX, and may be implemented from time to time in the future.

Use proceeds from securitized trade receivables (Short-term borrowings), bank facilities and commercial paper as needed, to supplement free cash flow and meet other cash requirements

- Our issued and outstanding commercial paper was \$613 million at December 31, 2016, all of which was denominated in U.S. dollars (U.S.\$456 million), compared to \$256 million (U.S.\$185 million) at December 31, 2015.
- Proceeds from securitized trade receivables were \$100 million at December 31, 2016, unchanged from December 31, 2015.

Report on financing and capital structure management plans

Maintain compliance with financial objectives

Certain of our current financial objectives will be reviewed in 2017 for possible revision due to changes arising from the adoption of new accounting standards, IFRS 15, *Revenue from Contracts with Customers* and IFRS 16, *Leases*. (See *Section 8.2 Accounting policy developments*.)

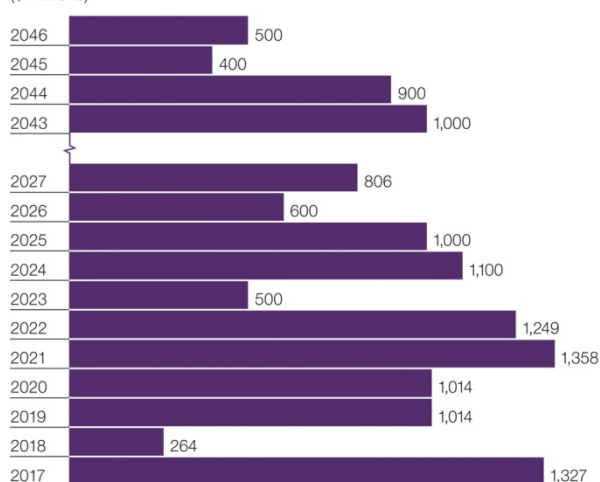
- Maintain investment grade credit ratings in the range of BBB+ or the equivalent – On February 9, 2017, investment grade credit ratings from the four rating agencies that cover TELUS were in the desired range. (See *Section 7.8 Credit ratings*.)
- Net debt to EBITDA – excluding restructuring and other costs ratio of 2.00 to 2.50 times – As measured at December 31, 2016, the ratio was 2.69 times, outside of the range, primarily due to the funding of spectrum licences acquired in wireless spectrum auctions held during 2014 and 2015. We will endeavour to return the ratio to within this objective range in the medium term, as we believe that this range is supportive of our long-term strategy. (See *Section 7.5 Liquidity and capital resource measures*.)
- Dividend payout ratio of 65 to 75% of net earnings per share on a prospective basis – Our target ratio is on a prospective basis. The dividend payout ratio we present in this MD&A is a historical measure utilizing the last four quarters of dividends declared and earnings per share, and is disclosed for illustrative purposes in evaluating our target guideline. As at December 31, 2016, the historical ratio of 89% and the adjusted historical ratio of 77% exceeded the objective range. We estimate that we will be within our target guideline on a prospective basis. (See *Section 7.5 Liquidity and capital resource measures*.)
- Generally maintain a minimum of \$1 billion in unutilized liquidity – As at December 31, 2016, our unutilized liquidity was more than \$1 billion. (See *Section 7.6 Credit facilities*.)

Financing and capital structure management plans for 2017

At the end of 2016, our long-term debt (excluding unamortized discount) was \$13.0 billion and the weighted average term to maturity was approximately 10.4 years (excluding commercial paper and the revolving component of the TELUS International credit facility). Our weighted average interest rate on long-term debt (excluding commercial paper and the revolving component of the TELUS International credit facility) was 4.22% at December 31, 2016, as compared to 4.32% one year earlier. Aside from Short-term borrowings of \$100 million, commercial paper of \$613 million (U.S.\$456 million) and the utilized revolving component of the TELUS International credit facility of \$58 million (U.S.\$44 million), all of our debt was on a fixed-rate basis.

During 2017, we may issue senior Notes to refinance maturing debt or to use for general corporate purposes. Anticipated free cash flow and sources of capital are expected to be more than sufficient to meet requirements. For the related risk discussion, see *Section 10.7 Financing, debt requirements and returning cash to shareholders*.

Long-term debt principal maturities as at December 31, 2016
(\$ millions)



4.4 Disclosure controls and procedures and changes in internal control over financial reporting

Disclosure controls and procedures

Disclosure controls and procedures are designed to provide reasonable assurance that all relevant information is gathered and reported to senior management, including the President and Chief Executive Officer (CEO) and the Executive Vice-President and Chief Financial Officer (CFO), on a timely basis so that appropriate decisions can be made regarding public disclosure.

The CEO and the CFO have assessed the effectiveness of our disclosure controls and procedures related to the preparation of this MD&A and the December 31, 2016, Consolidated financial statements. They have concluded that our disclosure controls and procedures were effective, at a reasonable assurance level, in ensuring that material information relating to TELUS and its consolidated subsidiaries would be made known to them by others within those entities, particularly during the period in which the MD&A and the Consolidated financial statements were being prepared.

Internal control over financial reporting

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 in accordance with IFRS-IASB and the requirements of the Securities and Exchange Commission in the United States, as applicable. TELUS’ CEO and CFO have assessed the effectiveness of our internal control over financial reporting as of December 31, 2016, in accordance with the criteria established in *Internal Control – Integrated Framework (2013)*, issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on this assessment, TELUS’ CEO and CFO have concluded that our internal control over financial reporting is effective as of December 31, 2016, and expect to certify TELUS’ annual filings with the Form 40-F, as required by the United States’ *Sarbanes-Oxley Act of 2002*, and TELUS’ Annual Information Form, as required by National Instrument 52-109 *Certification of Disclosure in Issuers’ Annual and Interim Filings*.

Deloitte LLP, our auditor, has audited our internal controls over financial reporting as at December 31, 2016.

Changes in internal control over financial reporting

There were no changes in internal control over financial reporting that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting in 2016.

5. Discussion of operations

This section contains forward-looking statements, including those with respect to our expectations for capitalization of long-term debt interest, deployment of wireless spectrum licences, ARPU growth, wireless retention spending and high-speed Internet subscriber growth trends as they relate to the future. There can be no assurance that we have accurately identified the trends based on past results, or that these trends will continue. See *Caution regarding forward-looking statements* at the beginning of this MD&A.

5.1 Selected annual information

The selected information presented below has been derived from, and should be read in conjunction with, our audited December 31, 2016 and December 31, 2015 Consolidated financial statements, which were prepared under IFRS-IASB. All currency amounts are in Canadian dollars, unless otherwise specified.

Selected annual information

Years ended December 31 (\$ in millions, except per share amounts)	2016	2015	2014
Operating revenues	12,799	12,502	12,002
Net income	1,236	1,382	1,425
Net income attributable to Common Shares	1,223	1,382	1,425
Net income per Common Share			
Basic earnings per share (basic EPS)	2.06	2.29	2.31
Diluted	2.06	2.29	2.31
Cash dividends declared per Common Share	1.84	1.68	1.52
At December 31 (\$ millions)	2016	2015	2014
Total assets	27,729	26,406	23,217
Current maturities of long-term debt	1,327	856	255
Non-current financial liabilities ¹			
Provisions	57	55	29
Long-term debt	11,604	11,182	9,055
Other long-term financial liabilities	170	150	128
Total non-current financial liabilities	11,831	11,387	9,212
Deferred income taxes	2,107	2,155	1,936
Common equity	7,917	7,672	7,454

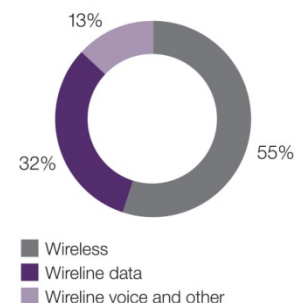
1 In our specific current instance, financial liabilities do not include liabilities that are excluded by definition (e.g. employee benefits and share-based compensation liabilities) or liabilities that do not involve a future outlay of economic resources (e.g. deferred recognition of customer activation and connection fees; deferred gains on sale-leaseback of buildings).

Operating revenues: Combined wireless revenue and wireline data revenue represented approximately 87% of consolidated revenues in 2016 (86% in 2015 and 84% in 2014).

Total assets: Growth in Total assets includes increases in Property, plant and equipment and Intangible assets, which increased by a combined \$1,107 million in 2016 and a combined \$2,801 million in 2015. These increases resulted primarily from our ongoing investments in broadband networks and purchases of wireless spectrum licences. See *Section 7.3 Cash used by investing activities*.

For changes in **Long-term debt**, see *Section 6: Changes in financial position and Section 7.4 Cash provided (used) by financing activities*.

2016 revenue mix – 87% wireless and data



5.2 Summary of consolidated quarterly results, trends and fourth quarter recap

Summary of quarterly results

(\$ millions, except per share amounts)	2016 Q4	2016 Q3	2016 Q2	2016 Q1	2015 Q4	2015 Q3	2015 Q2	2015 Q1
Operating revenues	3,305	3,238	3,148	3,108	3,217	3,155	3,102	3,028
Operating expenses								
Goods and services purchased ¹	1,574	1,426	1,331	1,300	1,482	1,394	1,372	1,284
Employee benefits expense ¹	962	681	628	668	757	693	649	609
Depreciation and amortization	533	515	499	500	518	471	464	456
Total operating expenses	3,069	2,622	2,458	2,468	2,757	2,558	2,485	2,349
Operating income	236	616	690	640	460	597	617	679
Financing costs	134	129	134	123	114	106	110	117
Income before income taxes	102	487	556	517	346	491	507	562
Income taxes	15	132	140	139	85	126	166	147
Net income	87	355	416	378	261	365	341	415
Net income attributable to Common Shares	81	348	416	378	261	365	341	415
Net income per Common Share:								
Basic (basic EPS)	0.14	0.59	0.70	0.64	0.44	0.61	0.56	0.68
Adjusted basic EPS ²	0.53	0.65	0.70	0.70	0.54	0.66	0.66	0.70
Diluted	0.14	0.59	0.70	0.64	0.44	0.61	0.56	0.68
Dividends declared per Common Share	0.48	0.46	0.46	0.44	0.44	0.42	0.42	0.40
Additional information:								
EBITDA ²	769	1,131	1,189	1,140	978	1,068	1,081	1,135
Restructuring and other costs ²	348	60	23	48	99	51	59	17
EBITDA — excluding restructuring and other costs ²	1,117	1,191	1,212	1,188	1,077	1,119	1,140	1,152
Cash provided by operating activities	732	1,032	892	563	870	1,025	943	718
Free cash flow ²	(191)	98	126	108	197	310	300	271

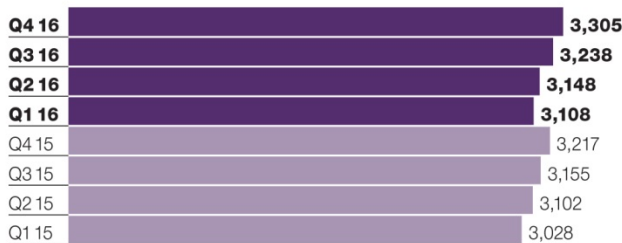
1 Goods and services purchased and Employee benefits expense amounts include restructuring and other costs.

2 See Section 11.1 Non-GAAP and other financial measures.

Trends

The consolidated revenue trend reflects increases in: (i) wireline data service revenues, driven by business process outsourcing, Internet, enhanced data services, TELUS TV services and TELUS Health revenues, with the increases in Internet and TV service revenues being generated by higher revenue per customer and subscriber growth; and (ii) wireless network revenue generated from growth in both our average revenue per subscriber unit per month (ARPU) and subscriber base. This growth was partially offset by the continued decline in wireline voice revenues and the decline in wireless and wireline equipment revenue. For additional information on wireless and wireline revenue and subscriber trends, see Section 5.4 Wireless segment and Section 5.5 Wireline segment. For discussion of industry trends, see Section 9.

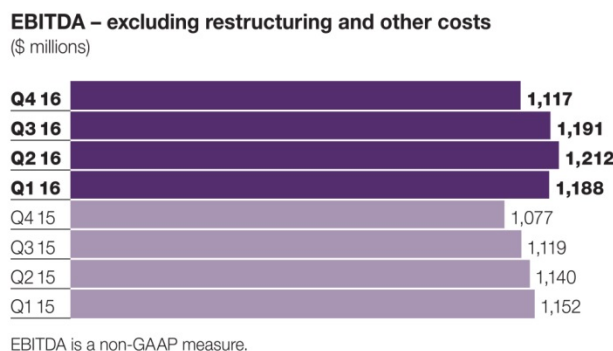
Operating revenues
(\$ millions)



The trend in Goods and services purchased expense generally reflects increasing wireless acquisition and retention costs, including equipment expenses associated with higher-value smartphones in the sales mix and increased handset costs; increasing wireless customer service, administrative, external labour and distribution channel expenses to support growth in our subscriber base; increased wireline TV costs of sales associated with a growing subscriber base; and

higher non-labour restructuring and other costs in 2015 mainly from real estate rationalization. These were partly offset by lower transit and termination costs and wireline equipment costs.

Employee benefits expense in the fourth quarter of 2016 includes a \$305 million immediately vesting transformative compensation (transformative compensation) expense, as described in *Collective bargaining and transformative change compensation* in Section 1.3, in lieu of general salary increases for 2017 and 2018 for substantially all of our Canadian-situated employees and other concessions under the collective agreement. Excluding this transformative compensation expense, the trend in Employee benefits expense reflected moderating wages and salaries resulting from a decrease in the number of full-time equivalent (FTE) domestic employees, partly offset by increases in TELUS International compensation and in the number of employees to support increased business process outsourcing revenue growth.



The general trend in Depreciation and amortization reflects increases due to growth in capital assets supporting the expansion of our broadband footprint and enhanced long-term evolution (LTE) network coverage, as well as the impact of our continuing program of asset life studies. The investments in our fibre-optic network also support our small-cell technology strategy to improve coverage and prepare for a more efficient and timely evolution to 5G.

The general trend in Financing costs reflects an increase in long-term debt outstanding, mainly associated with significant investments in wireless spectrum licences acquired during wireless spectrum licence auctions in 2014 and 2015 and our generational investments in fibre to homes and businesses. Financing costs also include the Employee defined benefit plans net interest expense, which decreased for 2016, primarily due to the decrease in the defined benefit plan deficit at December 31, 2015, as compared to one year earlier, partly offset by an increase in the discount rate. Moreover, Financing costs are net of capitalized interest related to spectrum licences acquired during the wireless spectrum licence auctions, which we expect to deploy into our existing network in future periods. Capitalization of long-term debt interest is expected to cease in 2017, as cell sites have become ready to utilize the spectrum frequencies. Financing costs for the eight periods shown included varying amounts of foreign exchange gains or losses and varying amounts of interest income, including \$20 million of interest income in the second quarter of 2015 resulting from the settlement of prior years’ income tax-related matters.

The trend in Net income reflects the items noted above, as well as non-cash adjustments arising from legislated income tax changes and adjustments recognized in the current periods for income tax of prior periods, including any related after-tax interest on reassessments. The trend in basic EPS is also impacted by the share purchases under our normal course issuer bid (NCIB) program.

The trend in Cash provided by operating activities reflects generally higher income tax payments and increased interest payments and higher restructuring and other disbursements, partly offset by growth in consolidated EBITDA – excluding restructuring and other costs. The trend in free cash flow reflects the factors affecting Cash provided by operating activities, as well as increases in capital expenditures (excluding spectrum licences). For further discussion on trends, see Section 5.4 *Wireless segment*, Section 5.5 *Wireline segment* and Section 9.2 *Telecommunications industry general outlook and trends*.

Fourth quarter recap

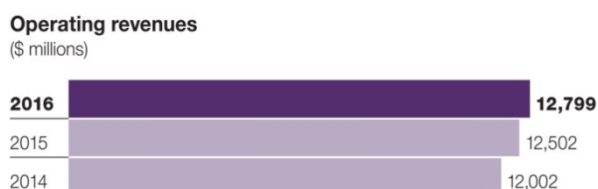
Results for the fourth quarter of 2016 were discussed in Management’s review of operations attached to our February 9, 2017 news release.

- **Consolidated operating revenues** increased by \$88 million or 2.7% in the fourth quarter of 2016 when compared to the fourth quarter of 2015, primarily reflecting growth in wireless network revenue and wireline data revenues, partly offset by the continuing decline in wireline voice revenues, consistent with the results for the full year, discussed in the following sections.

- Consolidated **EBITDA** decreased by \$209 million or 21% in the fourth quarter of 2016 when compared to the fourth quarter of 2015. The decrease was largely due to the \$305 million transformative compensation expense recorded in 2016. **Adjusted EBITDA**, which excludes restructuring and other costs, as well as real estate net gains and equity income related to real estate joint venture developments, increased by \$33 million or 3.1% in the fourth quarter. The increase was due to growth in wireless network revenue and wireline data revenues, improvements in Internet, business process outsourcing, TELUS TV and TELUS Health margins; and execution on our operational efficiency and effectiveness initiatives, partly offset by higher wireless acquisition and retention costs and continued declines in legacy wireline voice revenues. Had 2015 adjusted EBITDA also excluded the non-recurring gain on certain real estate assets in the fourth quarter of 2015, adjusted EBITDA would have reflected an increase of approximately \$53 million or 5.1% in the fourth quarter of 2016.
- **Net income attributable to Common Shares** decreased by \$180 million or 69% in the fourth quarter of 2016 when compared to the fourth quarter of 2015, largely due to the transformative compensation expense recorded in 2016. **Basic EPS** decreased by \$0.30 in the fourth quarter of 2016 when compared to the same period in 2015. When excluding restructuring and other costs, income tax-related adjustments, net gains and equity income from real estate joint venture developments in 2016, adjusted Net income decreased by 2.5% in the fourth quarter of 2016, while adjusted basic EPS decreased by \$0.01.
- **Cash provided by operating activities** decreased by \$138 million in the fourth quarter of 2016 when compared to the same period in 2015. The decrease was mainly due to lower EBITDA, resulting from the \$305 million transformative compensation expense, partly offset by operating working capital changes.
- **Cash used by investing activities** increased by \$223 million in the fourth quarter of 2016 when compared to the same period in 2015, mainly due to increased capital expenditures and changes in working capital amounts related to acquisitions in current and prior periods.
- **Cash provided by financing activities** increased by net \$301 million in the fourth quarter of 2016 when compared to the same period in 2015, as a result of lower purchases of shares under our NCIB program and an increase in net long-term debt issued.

5.3 Consolidated operations

The following is a discussion of our consolidated financial performance. Segment information in *Note 5* of the Consolidated financial statements is regularly reported to our Chief Executive Officer (CEO), the chief operating decision-maker. We discuss the performance of our segments in *Section 5.4 Wireless segment*, *Section 5.5 Wireline segment* and *Section 7.3 Cash used by investing activities – capital expenditures*.



Operating revenues

Years ended December 31 (\$ millions)	2016	2015	Change
Service	12,000	11,590	3.5 %
Equipment	725	840	(13.7) %
Revenues arising from contracts with customers	12,725	12,430	2.4 %
Other operating income	74	72	2.8 %
	12,799	12,502	2.4 %

Consolidated operating revenues increased by \$297 million in 2016.

- **Service revenue** increased by \$410 million in 2016, primarily reflecting growth in wireline data services and wireless network revenue, partly offset by the continuing decline in wireline voice revenues. Wireline data service revenue reflects increased Internet and enhanced data revenue, increased business process outsourcing revenue, and higher Internet, enhanced data and TELUS TV revenue. Internet, enhanced data, TV revenues reflect subscriber growth and higher revenue per customer. Wireless network revenue reflects growth in blended ARPU and the wireless subscriber base.

- **Equipment revenue** decreased by \$115 million in 2016, primarily reflecting a \$77 million decrease in wireless equipment revenue from a combination of higher per-unit subsidies, lower retention volumes and the discontinuance of Black’s Photography revenue from the closure of stores in August 2015, partly offset by higher-value smartphones in the sales mix. Also reflected is lower wireline equipment revenue of \$38 million, primarily from lower sales activity in the business market in part from the economic slowdown and a focus on providing managed services rather than equipment-only sales.
- **Other operating income** increased by \$2 million in 2016, mainly due to net gains and equity income related to real estate joint venture developments, gains from the sale of property, plant and equipment in 2016, and the gain from the exchange of wireless spectrum licences in the second quarter of 2016, partly offset by the non-recurrence of gains on the sale of certain real estate assets in the fourth quarter of 2015 and a decrease in amounts recognized from the regulatory price cap deferral account for provisioning broadband Internet services to eligible rural and remote communities.

Operating expenses

Years ended December 31 (\$ millions)	2016	2015	Change
Goods and services purchased	5,631	5,532	1.8 %
Employee benefits expense	2,939	2,708	8.5 %
Depreciation	1,564	1,475	6.0 %
Amortization of intangible assets	483	434	11.3 %
	10,617	10,149	4.6 %

Consolidated operating expenses increased by \$468 million in 2016. This increase included the transformative compensation expense of \$305 million recorded in the fourth quarter of 2016.

- **Goods and services purchased** increased by \$99 million in 2016 reflecting higher wireless acquisition and retention spending (including the effect of higher supplier costs of handsets, partially due to the decline in the Canadian dollar exchange rate vs. the U.S. dollar over the last two years), as well as increased roaming costs. The increases were also due to higher wireline network operating and administrative costs to support our growing subscriber base, and higher advertising and promotional expenses in support of bundled offerings and our response to heightened competitive intensity, as well as higher TV costs of sales due to a larger subscriber base, partly offset by lower transit and termination costs, ongoing operational efficiency and effectiveness initiatives, and lower equipment costs related to the decline in equipment revenue.
- **Employee benefits expense** increased by \$231 million in 2016, mainly due to the \$305 million transformative compensation expense recorded in the fourth quarter of 2016. See *Collective bargaining and transformative change compensation* in Section 1.3.

Excluding the transformative compensation expense, employee compensation decreased by \$74 million, mainly due to lower employee-related restructuring costs and realizing benefits from operational efficiency and effectiveness initiatives, partly offset by an increase in TELUS International employees and compensation to support growth in business process outsourcing revenue.

- **Depreciation** increased by \$89 million in 2016 due to the impact of our continuing program of asset life studies and increased expenditures associated with capital assets (such as the broadband network and the wireless LTE network), partly offset by asset retirements of \$9 million in 2015 relating to the closure of Black’s Photography retail stores.
- **Amortization of intangible assets** increased by \$49 million in 2016, reflecting increased expenditures associated with the intangible asset base, partly offset by software asset life adjustments arising from our continuing program of asset life studies.

Operating income

Years ended December 31 (\$ millions)	2016	2015	Change
Wireless EBITDA (see Section 5.4)	2,906	2,806	3.6 %
Wireline EBITDA (see Section 5.5)	1,323	1,456	(9.1)%
Depreciation and amortization (discussed above)	(2,047)	(1,909)	(7.2)%
	2,182	2,353	(7.3)%

Operating income decreased by \$171 million in 2016. Excluding the effects of the \$305 million transformative compensation expense recorded in the fourth quarter of 2016, Operating income increased by \$134 million. For a discussion of consolidated EBITDA and adjusted EBITDA, please see *Operating highlights* in Section 1.3.

Financing costs

Years ended December 31 (\$ millions)	2016	2015	Change
Gross interest expenses	554	515	7.6 %
Capitalized long-term debt interest	(52)	(45)	15.6 %
Interest expense	502	470	6.8 %
Employee defined benefit plans net interest	6	27	(77.8)%
Interest income	(3)	(25)	88.0 %
Foreign exchange losses (gains)	15	(25)	n/m
	520	447	16.3 %

Financing costs increased by \$73 million in 2016, mainly due to the following factors:

- **Gross interest expenses**, prior to capitalization of long-term debt interest, increased by \$39 million in 2016, primarily due to the increase in average long-term debt balances outstanding, including the full-year impact of increased debt related to the purchase of spectrum licences in 2015, partly offset by a reduction in the effective interest rate. Our weighted average interest rate on long-term debt (excluding commercial paper and the revolving component of the TELUS International credit facility) was 4.22% at December 31, 2016, as compared to 4.32% one year earlier. (See *Long-term debt issues and repayments* in Section 7.4.)
- **Capitalized long-term debt interest** is in respect of debt incurred for the purchase of spectrum licences during spectrum auctions held by Innovation, Science and Economic Development Canada (ISED), which we expect to deploy in our existing network in future periods. Capitalization of long-term debt interest occurs until substantially all of the activities necessary to prepare the spectrum for its intended use are complete, effectively when cell sites are ready to be put into service. Capitalization of interest is expected to cease in 2017.
- **Employee defined benefit plans net interest** decreased by \$21 million in 2016, mainly from the decrease in the defined benefit plan deficit at December 31, 2015, to \$53 million from \$598 million one year earlier, partly offset by a higher discount rate.
- **Interest income** in 2015 was derived primarily from \$23 million interest income related to the settlement of prior years’ income tax related matters.
- **Foreign exchange losses (gains)** have fluctuated as the weakening of the Canadian dollar relative to the U.S. dollar in 2016 combined with the increase in 2016 of foreign exchange derivatives being designated as held for hedging, rather than designated as held for trading.

Interest expense
(\$ millions)

**Income taxes**

Years ended December 31 (\$ millions, except tax rates)	2016	2015	Change
Income taxes computed at applicable statutory rates	444	505	(12.1)%
Revaluation of deferred income tax liability to reflect future statutory income tax rates	(4)	48	n/m
Adjustments recognized in the current period for income taxes of prior periods	(12)	(30)	60.0 %
Other	(2)	1	n/m
	426	524	(18.7)%
Income taxes computed at applicable statutory rates (%)	26.7	26.5	0.2 pts.
Effective tax rates (%)	25.6	27.5	(1.9) pts.

Total income tax expense decreased by \$98 million in 2016, primarily due to lower Income before income taxes, including the effects of the transformative compensation expense recorded in the fourth quarter of 2016. The decrease also resulted from revaluations of deferred income tax liabilities in 2016 to reflect the provincial income tax rate reduction in Quebec beginning in 2017, and the \$48 million non-cash adjustment in the second quarter of 2015 to revalue deferred income tax liabilities arising from an increase in the Alberta provincial corporate tax rate, partly offset by lower recoveries related to the settlement of prior years’ income tax-related matters (excluding related interest income).

Net income attributable to common shares

(\$ millions)



Comprehensive income

Years ended December 31 (\$ millions)	2016	2015	Change
Net income	1,236	1,382	(10.6)%
Other comprehensive income (loss) (net of income taxes):			
Items that may be subsequently reclassified to income	(15)	21	n/m
Item never subsequently reclassified to income –			
Employee defined benefit plans re-measurements	—	445	(100.0)%
Comprehensive income	1,221	1,848	(33.9)%

Comprehensive income decreased by \$627 million primarily due to changes in employee defined benefit plan re-measurement amounts and lower Net income. Items that may be subsequently reclassified to income are composed of changes in the unrealized fair value of derivatives designated as cash flow hedges, foreign currency translation adjustments arising from translating financial statements of foreign operations, and changes in the unrealized fair value of available-for-sale investments.

5.4 Wireless segment

<p>Postpaid subscribers 2016: 7,550,000 +2.7% 2015: 7,352,000</p>	<p>Prepaid subscribers 2016: 1,035,000 (6.3)% 2015: 1,105,000</p>	<p>Blended ARPU 2016: \$65.10 +2.6% 2015: \$63.45</p>	<p>Postpaid churn 2016: 0.95% +0.01 pts. 2015: 0.94%</p>
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Wireless trends and seasonality

The historical trend in wireless network revenue reflects growth in both our ARPU and subscriber base. This growth, coupled with higher-value smartphones in the sales mix, was partially offset by the decline in wireless equipment revenue, reflecting higher per-unit subsidies and lower retention volumes. Retention volumes declined due to (i) the effects on contract renewals of higher handset prices (including the effect of higher supplier costs due to depreciation of the Canadian dollar relative to the U.S. dollar over the last two years), as well as an increasing number of customers choosing to stay on month-to-month service; (ii) increased competitive intensity; and (iii) economic conditions resulting in customers purchasing fewer handsets.

The wireless ARPU growth trend has increased in 2016 due to a higher mix of data share plans and an increased mix of higher-rate plans, including the new Premium Plus plans launched in June 2016. This was partly offset by competitive pressures driving larger allotments of data provided in rate plans, including data sharing and international data roaming features and plans, consumer response to increased frequency of customer data usage notifications and offloading of data traffic to increasingly available Wi-Fi hotspots. ARPU is expected to continue to increase modestly in 2017, as a result of the continued growth in data usage and the ongoing shift in our subscriber base towards higher-value postpaid customers, as seen in the third and fourth quarters of 2016. However, the level of ARPU is highly dependent on competition, the economic environment, consumer behaviour, the regulatory environment, device selection and other factors, and, as a consequence, there cannot be assurance that ARPU growth will continue to materialize.

Retention spending as a percentage of network revenue has increased to 14.7% in 2016 from 13.9% in 2015, mainly from an increase in the sales mix of higher-subsidy smartphones and competitive pressures. While retention volumes decreased in 2016, we have generally experienced a higher volume of contract renewals than prior to 2015. We expect this trend to continue with two-year contracts in the consumer and small business base. We may also experience continuing pressure on our postpaid subscriber churn if competitive intensity continues, in part due to an increase in customers on expired contracts, as well as customers bringing their own devices and therefore not entering into term contracts. Accordingly, our wireless segment historical operating results and trends may not be reflective of results and trends for future periods.

Historically, there have been significant third and fourth quarter seasonal effects reflected in higher wireless subscriber additions, an increase in related acquisition costs and equipment sales, and higher retention costs due to contract renewals in those quarters. These impacts can be more pronounced around popular device launches and seasonal events such as back to school, Black Friday and Christmas. The costs associated with higher seasonal loading volumes have typically resulted in sequential decreases in wireless EBITDA from the second quarter through to the fourth quarter, typically followed by sequential increases in wireless EBITDA from the fourth quarter through to the second quarter. Subscriber additions have generally been lowest in the first quarter. Historically, wireless ARPU has experienced seasonal sequential increases in the second and third quarters, reflecting higher levels of usage and roaming in the spring and summer, followed by seasonal sequential declines in the fourth and first quarters. This seasonal effect on ARPU has moderated, as unlimited nationwide voice plans have become more prevalent and chargeable voice and long distance spikes become less pronounced. In addition, customers are opting for higher-capacity data plans resulting in less variability in chargeable data usage. See *Section 8.2 Accounting policy developments* for the timing of revenue recognition and classification of revenue effects of IFRS 15, *Revenue from Contracts with Customers*.

Wireless operating indicators

At December 31	2016	2015	Change
Subscribers¹ (000s):			
Postpaid	7,550	7,352	2.7 %
Prepaid	1,035	1,105	(6.3)%
Total	8,585	8,457	1.5%
Postpaid proportion of subscriber base (%)	87.9	86.9	1.0 pts.
HSPA+ population coverage ² (millions)	35.7	35.7	—%
LTE population coverage ² (millions)	35.2	34.9	0.9 %
Years ended December 31	2016	2015	Change
Subscriber gross additions (000s):			
Postpaid	1,039	1,014	2.5 %
Prepaid	360	429	(16.1)%
Total	1,399	1,443	(3.0)%
Subscriber net additions (000s):			
Postpaid	243	244	(0.4)%
Prepaid	(70)	(68)	(2.9)%
Total	173	176	(1.7)%
Blended ARPU, per month ³ (\$)	65.10	63.45	2.6 %
Churn, per month³ (%)			
Blended	1.21	1.26	(0.05)pts.
Postpaid	0.95	0.94	0.01 pts.
Cost of acquisition (COA) per gross subscriber addition ³ (\$)	455	418	8.9 %
Retention spend to network revenue ³ (%)	14.7	13.9	0.8 pts.

1 Subsequent to a review of our subscriber base during the first quarter of 2016, our 2016 opening postpaid subscriber base was reduced by 45,000.

2 Including network access agreements with other Canadian carriers.

3 See *Section 11.2 Operating indicators*. These are industry measures useful in assessing operating performance of a wireless company, but are not measures defined under IFRS-IASB.

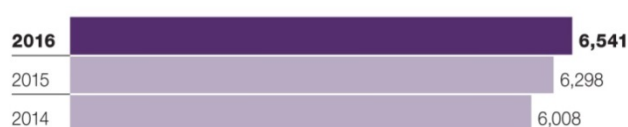
Operating revenues – Wireless segment

Years ended December 31 (\$ in millions, except ratios)	2016	2015	Change
Network revenue	6,541	6,298	3.9 %
Equipment and other service revenues	537	626	(14.2)%
Revenues arising from contracts with customers	7,078	6,924	2.2 %
Other operating income	37	9	n/m
External operating revenues	7,115	6,933	2.6 %
Intersegment network revenue	58	61	(4.9)%
Total operating revenues	7,173	6,994	2.6 %

Total wireless operating revenues increased by \$179 million in 2016.

Network revenue from external customers increased by \$243 million in 2016. Data network revenue increased by 9.4% in 2016, reflecting: (i) a larger proportion of higher-rate plans in the revenue mix, including the new Premium Plus plans launched in June 2016; (ii) a larger proportion of customers selecting plans with larger data buckets or periodically topping up their data buckets; (iii) growth in the subscriber base; (iv) a higher postpaid subscriber mix; and (v) increasing data usage from data-intensive devices. Voice network revenue decreased by 2.8% in 2016 due to the increased adoption of unlimited nationwide voice plans and continued but moderating substitution to data services, partly offset by growth in the subscriber base.

Wireless network revenue
(\$ millions)



- **Monthly blended ARPU** was \$65.10 in 2016, reflecting an increase of \$1.65 or 2.6%. The increase was primarily driven by effects of higher data network revenue (as described above), partly offset by the continued decline in voice revenue.
- **Gross subscriber additions** decreased by 44,000 in 2016. Postpaid gross additions increased by 25,000 due to the success of targeted promotions and our marketing efforts focused on higher-value postpaid loading, partly offset by competitive intensity and the effects of the economic slowdown, particularly in Alberta. Prepaid gross activations decreased by 69,000 mainly from competitive intensity, lower-priced postpaid offers and our marketing efforts focused on higher-value postpaid loading.
- Our **average monthly postpaid subscriber churn rate** was 0.95% in 2016, as compared to 0.94% in 2015. The continuing low postpaid subscriber churn rates during 2016 reflect our focus on executing on customers first initiatives and retention programs, partly offset by competitive intensity and the effects of the economic slowdown, particularly in Alberta, and the simultaneous expiration of two-year and three-year customer contracts in the first half of 2016. Our blended monthly subscriber churn rate was 1.21% in 2016, as compared to 1.26% in 2015. The improvement in our blended subscriber churn rate in 2016 reflects improvements in the prepaid churn rates, as well as an increase in the mix of postpaid subscribers.
- **Net subscriber additions** declined by 3,000 in 2016 due to lower gross additions, partly offset by an improvement in blended monthly churn rate. Prepaid subscriber net losses in 2016 were comparable to those in 2015 and reflect conversions to postpaid services (due to our marketing efforts focused on higher-value postpaid loading) and increased competition for prepaid services.

Equipment and other service revenues decreased by \$89 million in 2016, mainly from a combination of higher per-unit subsidies, lower retention volumes, competitive intensity and the discontinuance of Black’s Photography revenue from the closure of stores in August 2015, partly offset by increased postpaid gross additions and higher-value smartphones in the sales mix.

Other operating income increased by \$28 million in 2016, mainly due to net gains and equity income related to real estate joint venture developments, gains from the sale of property, plant and equipment in 2016, and the gain from the exchange of wireless spectrum licences in the second quarter of 2016, partly offset by the non-recurrence of gains on the sale of certain real estate assets in 2015.

Intersegment revenue represents network services that are eliminated upon consolidation along with the associated wireline expenses.

Operating expenses – Wireless segment

Years ended December 31 (\$ in millions)	2016	2015	Change
Goods and services purchased:			
Equipment sales expenses	1,684	1,623	3.8 %
Network operating expenses	773	759	1.8 %
Marketing expenses	420	436	(3.7)%
Other ¹	667	653	2.1 %
Employee benefits expense ^{1 2}	723	717	0.8 %
Wireless operating expenses	4,267	4,188	1.9 %

1 Includes restructuring and other costs. See *Section 11.1 Non-GAAP and other financial measures*.

2 Includes transformative compensation expense of \$70 million recorded in other costs in the fourth quarter of 2016.

Wireless expenses increased by \$79 million in 2016.

Equipment sales expenses increased by \$61 million in 2016, reflecting an increase in higher-value smartphones in the sales mix, including premium devices on Premium Plus plans, increasing handset costs (including the effect of higher supplier costs due to depreciation of the Canadian dollar relative to the U.S. dollar over the last two years) and increased postpaid gross additions, partly offset by lower retention volumes, and by lower cost of sales from the closure of Black’s Photography stores in August 2015.

- **Retention costs as a percentage of network revenue** were 14.7% in 2016, as compared to 13.9% in 2015. The increase was driven by higher per-unit subsidy costs including the impacts of the new Premium Plus plans launched in June 2016, reflecting the factors noted in Equipment sales expenses above, partly offset by lower retention volumes and lower associated commissions.
- **COA per gross subscriber addition** was \$455 in 2016, reflecting an increase of \$37 from 2015. The increase reflects the factors noted in Equipment sales expenses above, partly offset by lower commissions.

Network operating expenses increased by \$14 million in 2016, mainly due to increased roaming volumes, partly offset by lower maintenance costs.

Marketing expenses declined by \$16 million in 2016, primarily due to lower advertising and promotions expenses, as well as lower commission expenses driven by lower gross additions and retention volumes.

Other goods and services purchased increased by \$14 million in 2016, primarily due to an increase in external labour, higher non-labour restructuring and other costs, and higher bad debt provisions resulting from a larger subscriber base, partly offset by lower non-labour restructuring and other costs from provisions for the closure of Black’s Photography retail stores during the third quarter of 2015.

Employee benefits expense increased mainly due to the transformative compensation expense recorded in the fourth quarter of 2016 (see *Collective bargaining and transformative change compensation* in Section 1.3). Excluding the transformative compensation expense, employee compensation decreased by \$64 million, mainly due to lower employee-related restructuring costs and realizing benefits from ongoing operational efficiency and effectiveness initiatives.

EBITDA – Wireless segment

Years ended December 31 (\$ millions, except margins)	2016	2015	Change
EBITDA	2,906	2,806	3.6 %
Restructuring and other costs included in EBITDA ¹	121	81	49.4 %
EBITDA – excluding restructuring and other costs	3,027	2,887	4.8 %
Deduct gain on the exchange of wireless spectrum licences	(15)	—	n/m
Deduct net gains and equity income from real estate joint venture developments	(12)	—	n/m
Adjusted EBITDA ²	3,000	2,887	3.9 %
EBITDA margin (%)	40.5	40.1	0.4 pts.
Adjusted EBITDA margin ³ (%)	42.0	41.3	0.7 pts.

- 1 Includes transformative compensation expense of \$70 million recorded in other costs in the fourth quarter of 2016.
- 2 See description under *EBITDA* in *Section 11.1*.
- 3 The calculation of the Adjusted EBITDA margin excludes the net gains and equity income on real estate joint venture developments from both EBITDA and Operating revenues, and excludes restructuring and other costs from EBITDA.

Wireless EBITDA increased by \$100 million in 2016, including the transformative compensation expense recorded in the fourth quarter of 2016. Wireless adjusted EBITDA increased by \$113 million in 2016, reflecting network revenue growth driven by higher ARPU and a larger customer base, as well as executing on ongoing operational efficiency and effectiveness initiatives, partly offset by higher acquisition and retention spending. Had 2015 adjusted EBITDA also excluded the non-recurring gain on certain real estate assets in the fourth quarter of 2015, wireless adjusted EBITDA would have reflected an increase of approximately \$120 million or 4.2% in 2016.

Wireless EBITDA – excluding restructuring and other costs
(\$ millions)



5.5 Wireline segment

High-speed Internet subscribers	TELUS TV subscribers	Residential NALs	Total wireline subscribers
2016: 1,655,000 +5.7%	2016: 1,059,000 +5.4%	2016: 1,374,000 (6.3)%	2016: 4,088,000 +1.2%
2015: 1,566,000	2015: 1,005,000	2015: 1,467,000	2015: 4,038,000

Wireline trends

The trend of increasing wireline data service revenue reflects growth in business process outsourcing services, high-speed Internet and enhanced data services, TELUS TV revenues and TELUS Health revenues, and is partly offset by declining data equipment revenues. The increases in Internet and TV service revenues are being generated by higher revenue per customer and subscriber growth. The trend of declining wireline voice revenues is due to technological substitution, greater use of inclusive long distance and lower wholesale volumes competition from voice over IP (VoIP) service providers (including cable-TV competitors), resellers and facilities-based competitors, as well as technological substitution to wireless and IP-based services and applications, continuing increased competition in the small and medium-sized business market, and the impact of the economic slowdown.

High-speed Internet subscriber base growth slowed in 2016, primarily from the impact of the economic slowdown and competitive intensity; however, we expect continued subscriber growth as the economy recovers and as we continue our investments in expanding our fibre-optic network. TELUS TV subscriber base growth has moderated due to a declining overall market for paid TV services resulting from the economic slowdown, the high rate of market penetration and increased competition, including from over-the-top (OTT) services. Residential network access line (NAL) losses continue to reflect the economic slowdown and the ongoing trend of substitution to wireless and Internet-based services.

Wireline operating indicators

At December 31 (000s)	2016	2015	Change
Subscriber connections:			
High-speed Internet subscribers	1,655	1,566	5.7 %
TELUS TV subscribers	1,059	1,005	5.4 %
Residential network access lines (NALs)	1,374	1,467	(6.3)%
Total wireline subscriber connections ¹	4,088	4,038	1.2 %
Subscriber connection net additions (losses):			
High-speed Internet	68	91	(25.3)%
TELUS TV	54	89	(39.3)%
Residential NALs	(93)	(89)	(4.5)%
Total wireline subscriber connection net additions ¹	29	91	(68.1)%

1 Subsequent to a review of our subscriber base during the first quarter of 2016, our 2016 opening high-speed Internet subscriber base was increased by 21,000.

Wireline external revenue

(\$ millions)


Operating revenues – Wireline segment

Years ended December 31 (\$ in millions)	2016	2015	Change
Data services and equipment	4,059	3,772	7.6 %
Voice services	1,363	1,496	(8.9)%
Other services and equipment	225	238	(5.5)%
Revenues arising from contracts with customers	5,647	5,506	2.6 %
Other operating income	37	63	(41.3)%
External operating revenues	5,684	5,569	2.1 %
Intersegment revenue	194	174	11.5 %
Total operating revenues	5,878	5,743	2.4 %

Total wireline operating revenues increased by \$135 million in 2016.

- **Data services and equipment** revenues increased by \$287 million in 2016. The increase was primarily due to: (i) increased Internet and enhanced data service revenues resulting from a 5.7% increase in our high-speed Internet subscribers over 12 months, higher revenue per customer from upgrades to faster Internet speeds and larger usage Internet rate plans, subscribers coming off of promotional offers, the phased-in introduction of usage-based billing in 2015 and certain rate increases; (ii) growth in business process outsourcing revenues; and (iii) increased TELUS TV revenues resulting from a 5.4% subscriber growth over 12 months and higher revenue per customer, including certain rate increases. This growth was partly offset by the ongoing decline in legacy data services, as well as a decline in data equipment revenues in the business market related to the economic slowdown, particularly in Alberta.
- **Voice services** revenues decreased by \$133 million in 2016. The decrease reflects the ongoing decline in legacy revenues from technological substitution, the economic slowdown, increased competition, greater use of inclusive long distance plans and lower long distance minutes of use, including lower wholesale volumes, partially offset by certain rate increases. We experienced a 6.3% decline in residential NALs in the year.
- **Wireline subscriber connection net additions** were 29,000 in 2016, or a decrease of 62,000 from 2015.

Net additions of high-speed Internet subscribers declined by 23,000 in 2016. The decrease was due to the effects of heightened competitive intensity and the impact of the economic slowdown in Alberta, resulting in increased churn, partly offset by the continued expansion of our high-speed broadband footprint, including fibre to the premises and the pull-through impact from the continued adoption of Optik TV. Net additions of TELUS TV subscribers were down 35,000 in 2016. The decrease reflects lower gross additions, a higher customer churn rate and a decline in satellite-TV subscribers due to a declining overall market for paid TV services resulting from the economic slowdown in Alberta, a high rate of market penetration and the effects of heightened competitive intensity, including OTT services. These pressures were partly offset by the continued focus on expanding our addressable

high-speed Internet and Optik TV footprint, connecting more homes and businesses directly to fibre, and bundling these services together. This contributed to combined Internet and TV subscriber growth of 122,000 or 4.7% in 2016.

Residential NAL losses were 93,000 in 2016, as compared to NAL losses of 89,000 in 2015. The residential NAL losses continue to reflect the economic slowdown, the ongoing trend of substitution to wireless and Internet-based services, and increased competition, partially mitigated by the success of our bundled service offerings and our customers first initiatives.

- **Other services and equipment** revenues decreased by \$13 million in 2016, mainly due to declines in voice equipment sales.

Other operating income decreased by \$26 million in 2016, mainly due to non-recurrence of gains on the sale of certain real estate assets in the fourth quarter of 2015, as well as a decrease in amounts recognized from the regulatory price cap deferral account for provisioning broadband Internet services to eligible rural and remote communities. Partly offsetting these were net gains and equity income on real estate joint venture developments in 2016.

Intersegment revenue represents services provided to the wireless segment. Such revenue is eliminated upon consolidation together with the associated expenses in wireless.

Operating expenses – Wireline segment

Years ended December 31 (\$ millions)	2016	2015	Change
Goods and services purchased ¹	2,339	2,296	1.9 %
Employee benefits expense ^{1 2}	2,216	1,991	11.3 %
Wireline operating expenses	4,555	4,287	6.3 %

1 Includes restructuring and other costs. See *Section 11.1 Non-GAAP and other financial measures*.

2 Includes transformative compensation expense of \$235 million recorded in other costs in the fourth quarter of 2016.

Total wireline operating expenses increased by \$268 million in 2016, primarily due to the following factors:

Goods and services purchased increased by \$43 million in 2016, due to increased network operating and administrative costs to support our growing subscriber base, and higher advertising and promotional expenses related to bundled offerings and in response to heightened competitive intensity, as well as higher TELUS TV costs of sales due to a larger subscriber base, partly offset by lower transit and termination costs and lower equipment costs related to declining equipment revenue.

Employee benefits expense increased by \$225 million in 2016, mainly due to the transformative compensation expense recorded in the fourth quarter of 2016 (see *Collective bargaining and transformative change compensation* in *Section 1.3*). Excluding the transformative compensation expense, employee compensation decreased by \$10 million, mainly due to lower employee-related restructuring costs and realizing benefits from ongoing operational efficiency and effectiveness initiatives, partly offset by an increase in TELUS International employees and compensation supporting growing business process outsourcing revenue.

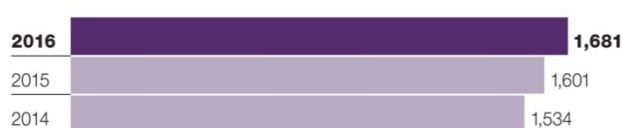
EBITDA – Wireline segment

Years ended December 31 (\$ millions, except margins)	2016	2015	Change
EBITDA	1,323	1,456	(9.1)%
Restructuring and other costs included in EBITDA ¹	358	145	n/m %
EBITDA – excluding restructuring and other costs	1,681	1,601	5.0 %
Deduct net gains and equity income from real estate joint venture developments	(14)	—	n/m
Adjusted EBITDA ²	1,667	1,601	4.1 %
EBITDA margin (%)	22.5	25.4	(2.9) pts.
Adjusted EBITDA margin ³ (%)	28.4	27.9	0.5 pts.

- 1 Includes transformative compensation expense of \$235 million recorded in other costs in the fourth quarter of 2016.
- 2 See description under *EBITDA* in *Section 11.1*.
- 3 The calculation of the Adjusted EBITDA margin excludes the net gains and equity income on real estate joint venture developments from both EBITDA and Operating revenues, and excludes restructuring and other costs from EBITDA.

Wireline EBITDA decreased by \$133 million in 2016, mainly due to the transformative compensation expense recorded in the fourth quarter of 2016. Wireline adjusted EBITDA increased by 4.1% in 2016, as compared to an operating revenue increase of 2.4% in 2016, excluding the net revenue impacts from the real estate joint venture developments. This reflects our execution on cost efficiency programs, as well as improving margins in data services, including Internet, business process outsourcing services, TELUS TV and TELUS Health services. Had 2015 adjusted EBITDA also excluded the non-recurring gain on certain real estate assets in the fourth quarter of 2015, wireline adjusted EBITDA would have reflected an increase of approximately \$79 million or 5.0% in 2016.

Wireline EBITDA – excluding restructuring and other costs
(\$ millions)



6. Changes in financial position

Financial position at: (\$ millions)	December 31		Change		Change includes:
	2016	2015	(\$ millions)	(%)	
Current assets					
Cash and temporary investments, net	432	223	209	94 %	See <i>Section 7 Liquidity and capital resources</i>
Accounts receivable	1,471	1,428	43	3 %	An increase in wireless receivables related to higher postpaid average revenue per subscriber unit per month (ARPU) and subscriber growth
Income and other taxes receivable	9	1	8	n/m	—
Inventories	318	360	(42)	(12)%	A decrease in the quantity of higher-value smartphones
Prepaid expenses	233	213	20	9 %	An increase in prepaid maintenance contracts
Real estate joint venture advances	—	66	(66)	(100)%	Repayment of the construction credit facility concurrent with the commencement of the closing of residential condominium unit sales
Current derivative assets	11	40	(29)	(73)%	A decrease in U.S. currency hedging items.
Current liabilities					
Short-term borrowings	100	100	—	—	See <i>Section 7.7 Sale of trade receivables</i>
Accounts payable and accrued liabilities	2,330	1,990	340	17 %	An increase in payables associated with higher capital expenditures, coupled with payables related to employee benefits. See <i>Note 23 of the Consolidated financial statements</i>
Income and other taxes payable	37	108	(71)	(66)%	Instalments made during the year exceeded current income tax expense
Dividends payable	284	263	21	8 %	Effects of an increase in the dividend rate, net fewer shares outstanding
Advance billings and customer deposits	737	760	(23)	(3)%	A decrease in revenues billed in advance, coupled with a decrease in the regulatory price cap deferral account resulting from recognition of amounts for provisioning broadband Internet services to eligible rural and remote communities. See <i>Note 24 of the Consolidated financial statements</i>
Provisions	124	197	(73)	(37)%	Payment of certain current provisions (see <i>Note 25 of the Consolidated financial statements</i>), coupled with employee-related restructuring disbursements in excess of associated expenses
Current maturities of long-term debt	1,327	856	471	55 %	An increase in outstanding commercial paper of \$357 million, as well as amounts reclassified from long-term debt relating to the upcoming maturity of \$700 million of our 4.95% Notes, Series CD in March 2017, offset by redemption of \$600 million of our 3.65% Notes, Series CI in May 2016
Current derivative liabilities	12	2	10	n/m	An increase in U.S. currency hedging items.
Working capital (Current assets subtracting Current liabilities)	(2,477)	(1,945)	(532)	(27)%	Includes a \$471 million increase in current maturities of long-term debt. TELUS normally has a negative working capital position. See <i>Capital structure management policies</i> in <i>Section 4.3</i> and the <i>Liquidity risk</i> discussion in <i>Section 7.9</i> .

Financial position at: (\$ millions)	December 31		Change		Change includes:
	2016	2015	(\$ millions)	(%)	
Non-current assets					
Property, plant and equipment, net	10,464	9,736	728	7 %	See <i>Capital expenditures</i> in Section 7.3 <i>Cash used by investing activities</i> and <i>Depreciation</i> in Section 5.3
Intangible assets, net	10,364	9,985	379	4 %	See <i>Capital expenditures</i> in Section 7.3 <i>Cash used by investing activities</i> and <i>Amortization of intangible assets</i> in Section 5.3
Goodwill, net	3,787	3,761	26	1 %	An increase from immaterial acquisitions
Other long-term assets	640	593	47	8 %	Advances to real estate partnership and an increase in long-term deferred operating costs
Non-current liabilities					
Provisions	395	433	(38)	(9)%	A decrease in asset retirement obligations arising from an increase in discount rates, coupled with restructuring costs classified to current. See <i>Note 25 of the Consolidated financial statements</i>
Long-term debt	11,604	11,182	422	4 %	See Section 7.4 <i>Cash provided (used) by financing activities</i>
Other long-term liabilities	736	688	48	7 %	Increase in pension and post-retirement liability. See <i>Note 27 of the Consolidated financial statements</i>
Deferred income taxes	2,107	2,155	(48)	(2)%	Reduction in temporary difference between the accounting and tax basis of assets and liabilities, as well as the revaluation of the liability at lower future income tax rates.
Owners' equity					
Common equity	7,917	7,672	245	3 %	Net income of \$1,223 million, Other comprehensive loss of \$17 million, impact on contributed surplus arising from subsidiary issuance of shares to non-controlling interest of \$239 million, net of dividend declarations of \$1,091 million, and share purchase activity under our normal course issuer bid program (see Section 7.4 <i>Cash provided (used) by financing activities</i>)
Non-controlling interest	19	—	19	n/m	Impact arising from the 35% non-controlling interest in TELUS International.

7. Liquidity and capital resources

This section contains forward-looking statements, including those with respect to our dividend payout ratio and net debt to EBITDA – excluding restructuring and other costs ratio. See *Caution regarding forward-looking statements* at the beginning of this MD&A.

7.1 Overview

Our capital structure financial policies and financing and capital structure management plans are described in Section 4.3.

Cash flows

Years ended December 31 (\$ millions)	2016	2015	Change
Cash provided by operating activities	3,219	3,556	(9.5)%
Cash used by investing activities	(2,923)	(4,477)	34.7 %
Cash provided (used) by financing activities	(87)	1,084	n/m
Increase (decrease) in Cash and temporary investments, net	209	163	28.2 %
Cash and temporary investments, net, beginning of period	223	60	n/m
Cash and temporary investments, net, end of period	432	223	93.7 %

7.2 Cash provided by operating activities

Analysis of changes in cash provided by operating activities

Years ended December 31 (\$ millions)	2016	2015	Change
EBITDA (see <i>Section 5.4</i> and <i>Section 5.5</i>)	4,229	4,262	(33)
Restructuring and other costs, net of disbursements	24	97	(73)
Employee defined benefit plans expense, net of employer contributions	22	24	(2)
Share-based compensation expense, net of payments	(2)	(38)	36
Interest paid, net of interest received	(506)	(434)	(72)
Income taxes paid, net of refunds received	(600)	(256)	(344)
Other operating working capital changes	52	(99)	151
Cash provided by operating activities	3,219	3,556	(337)

- Share-based compensation expense, net of payments decreased mainly due to cash outflows associated with the 2012 restricted stock units (RSUs) being made in the first quarter of 2015 that would normally have been paid in the fourth quarter of 2014. This resulted from a delay in the 2012 annual allocation of RSUs.
- Income taxes paid, net of refunds received, increased in 2016, reflecting higher required instalment payments and higher refunds received in the comparative period in 2015, as well as a larger final income tax payment in the first quarter of 2016 in respect of the 2015 income tax year than was required in the first quarter of 2015 in respect of the 2014 income tax year, mainly due to the use of Public Mobile losses in 2014.
- Other operating working capital changes in 2016 include an increase in Accounts payable and accrued liabilities, net of an increase in Accounts receivable. (See *Section 6 Changes in financial position* and *Note 31(a)* in the Consolidated financial statements.)

Cash provided by operating activities

(\$ millions)



Cash used by investing activities

(\$ millions)



7.3 Cash used by investing activities

Cash used by investing activities

(\$ millions)	Years ended December 31		
	2016	2015	Change
Cash payments for capital assets, excluding spectrum licences	(2,752)	(2,522)	(230)
Cash payments for spectrum licences	(145)	(2,048)	1,903
Cash payments for acquisitions	(90)	(10)	(80)
Real estate joint venture receipts, net of advances and contributions	70	48	22
Proceeds on dispositions	3	52	(49)
Other	(9)	3	(12)
Cash used by investing activities	(2,923)	(4,477)	1,554

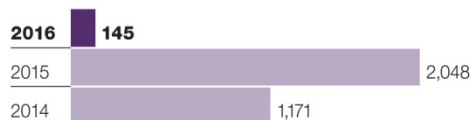
- The increase in Cash payments for capital assets, excluding spectrum licences, was composed of:
 - A \$391 million increase in capital expenditures in 2016 (see *Capital expenditure measures* table and discussion below).
 - Lower capital expenditure payments with respect to payment timing differences, as associated Accounts payable and accrued liabilities increased by \$171 million for 2016, net of changes in asset retirement obligations of \$10 million.
- Payments for spectrum licences in 2016 were monetary consideration as part of an approved spectrum licence exchange with Xplornet (see *Building national capabilities* in *Section 2.2*). Payments in 2015 were for the AWS-3 and 2500 MHz spectrum licences acquired in Innovation, Science and Economic Development Canada’s (ISED’s) wireless spectrum auctions.
- Cash payments for acquisitions were in respect of several individually immaterial acquisitions complementary to our existing lines of business.

- Receipts from real estate joint ventures, net of advances and contributions, resulted mainly from repayment of construction financing from the TELUS Garden real estate joint venture.
- Proceeds on dispositions in 2015 were primarily related to the sale of real estate properties and small portfolio investments.

Capital expenditures – excluding spectrum licences
(\$ millions)



Cash payments for spectrum licences
(\$ millions)



Capital expenditure measures

Years ended December 31 (\$ millions, except capital intensity)	2016	2015	Change
Capital expenditures (excluding spectrum licences)¹			
Wireless segment	982	893	10.0 %
Wireline segment	1,986	1,684	17.9 %
Consolidated	2,968	2,577	15.2 %
Wireless segment capital intensity (%)	14	13	1 pt.
Wireline segment capital intensity (%)	34	29	5 pts.
Consolidated capital intensity ² (%)	23	21	2 pts.

1 Capital expenditures include assets purchased but not yet paid for, and therefore differ from Cash payments for capital assets, as presented on the Consolidated statements of cash flows.
2 See Section 11.1 Non-GAAP and other financial measures.

Wireless segment capital expenditures increased by \$89 million in 2016, primarily due to continuing investments in our fibre-optic network to support our small-cell technology strategy to improve coverage and prepare for a more efficient and timely evolution to 5G, as well as higher spending on the deployment of the 700 MHz and 2500 MHz spectrum bands, and in cost efficiency initiatives. We also continued to invest in system and network resiliency and reliability in support of our ongoing customers first initiatives and to ready the network and systems for future retirement of legacy assets.

Wireline segment capital expenditures increased by \$302 million in 2016 due to continuing investments in our broadband infrastructure, including connecting more homes and businesses directly to our fibre-optic network. This investment supports our high-speed Internet and Optik TV subscriber growth, as well as our customers’ demand for faster Internet speeds, and extends the reach and functionality of our business and healthcare solutions. We also continued to make investments in cost efficiency initiatives, as well as in system and network resiliency and reliability.

7.4 Cash provided (used) by financing activities

Cash provided (used) by financing activities

(\$ millions)	Years ended December 31		
	2016	2015	Change
Dividends paid to holders of Common Shares	(1,070)	(992)	(78)
Purchase of Common Shares for cancellation	(179)	(628)	449
Long-term debt issued net of redemptions and repayment	883	2,719	(1,836)
Issue of shares by subsidiary to non-controlling interest	294	—	294
Other	(15)	(15)	—
	(87)	1,084	(1,171)

Dividends paid to the holders of Common Shares

The increase in Dividends paid to the holders of Common Shares reflects higher dividend rates under our dividend growth program, partially offset by a lower number of outstanding shares resulting from shares purchased and cancelled under our normal course issuer bid (NCIB) program.

Purchase of Common Shares for cancellation

Our 2016 NCIB concluded on September 14, 2016 and our 2017 NCIB commenced on September 30, 2016. See *Section 4.3* for details of our planned multi-year share purchase program through 2019. In 2015, we purchased approximately 16 million shares for \$628 million under the 2015 and 2016 NCIBs.

Normal course issuer bid purchases

Period	Common Shares purchased and cancelled (millions)	Average purchase price per share (\$)	Purchase costs (\$ millions)	Increase (decrease) in Accounts payable (\$ millions)	Cash outflow (\$ millions)
2016 Q1	1	37.77	50	(10)	60
2016 Q2	2	38.43	61	—	61
2016 Q3	—	42.92	19	—	19
2016 Q4	1	39.64	35	—	35
Total excluding employee benefit plan trust transactions	4	39.34	165	(10)	175
Employee benefit plan trust transactions – 2016 Q4			4	—	4
2016 year			169	(10)	179

Long-term debt issues and repayments

Net long-term debt issues and repayments in 2016 were composed primarily of:

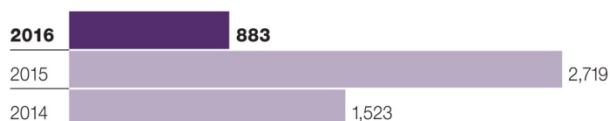
- The September 2016 public issue of U.S.\$600 million of senior unsecured Notes at 2.80%, due February 16, 2027. The proceeds were used to repay U.S.\$453 million of commercial paper, with the balance to be used for general corporate purposes. We have entered into a foreign exchange derivative (a cross currency interest rate exchange agreement) which effectively converted the principal payments and interest obligations to Canadian dollar obligations with an effective fixed interest rate of 2.95% and an effective issued and outstanding amount of \$792 million (reflecting a fixed exchange rate of \$1.3205). For additional information on these notes, please refer to *Note 26(b)* of the Consolidated financial statements.
- A \$357 million net increase in commercial paper, including foreign exchange effects, to a balance of \$613 million at December 31, 2016 (U.S.\$456 million) from \$256 million (U.S.\$185 million) at December 31, 2015. Our commercial paper program, when utilized, provides low-cost funds and is fully backstopped by the five-year committed credit facility (see *Section 7.6 Credit facilities*).
- Net draws on the TELUS International credit facility of \$332 million (U.S.\$253 million) as at December 31, 2016.
- Net of the \$600 million repayment of Series CI Notes in May 2016.

In comparison, net long-term debt issues and repayments in 2015 were composed primarily of:

- A March 24, 2015, public issue of \$1.75 billion of senior unsecured notes in three series composed of a \$250 million offering at 1.50% due March 27, 2018, a \$1.0 billion offering at 2.35% due March 28, 2022, and a \$500 million offering at 4.40% due January 29, 2046. The net proceeds were used to fund a portion of the \$1.5 billion purchase price of the wireless spectrum licences acquired in ISED’s AWS-3 spectrum auction during the first quarter of 2015, and to repay approximately \$110 million of indebtedness drawn from the 2014 credit facility (which was subsequently renewed and extended) and approximately \$135 million of outstanding commercial paper. The remainder was used for general corporate purposes.
- A \$400 million draw on our five-year revolving credit facility in the second quarter of 2015, which was reduced to \$NIL during the third quarter of 2015. At December 31, 2015, no amounts were drawn against our five-year credit facility (\$256 million was utilized to backstop outstanding commercial paper).
- A November 23, 2015, repayment of our \$125 million TELUS Communications Inc. Series 2 Debentures, upon maturity.
- A December 8, 2015, public issue of \$1.0 billion of senior unsecured notes composed of a \$600 million offering at 3.75% due March 10, 2026 and \$400 million of 4.85% Notes through the re-opening of Series CP notes, maturing April 5, 2044. The net proceeds were used to repay approximately \$956 million of outstanding commercial paper and to fund the repayment, on maturity, of a portion of the \$600 million principal amount outstanding on TELUS’ Series CI Notes due May 2016. The balance was used for general corporate purposes.
- A \$126 million net increase in commercial paper to \$256 million (U.S.\$185 million) at December 31, 2015.

Net increase in long-term debt and short-term borrowings

(\$ millions)



Average term to maturity of long-term debt

(years)



The average term to maturity of our long-term debt (excluding commercial paper and the revolving component of the TELUS International credit facility) decreased to approximately 10.4 years at December 31, 2016, compared to approximately 11.1 years at the end of 2015. Additionally, our weighted average cost of long-term debt was 4.22% at December 31, 2016, compared to 4.32% at the end of 2015.

Issue of shares by subsidiary to non-controlling interest

In June 2016, a subsidiary issued shares to Baring Asia which acquired a 35% non-controlling interest in TELUS International. (See *Section 1.3 Highlights of 2016.*) Cash proceeds net of issue costs currently paid were \$294 million as at December 31, 2016.

7.5 Liquidity and capital resource measures

Net debt was \$12.7 billion at December 31, 2016, an increase of \$0.7 billion when compared to one year earlier, resulting mainly from the draw on the TELUS International credit facility, the increase in commercial paper and the issue of U.S.\$600 million Notes in September 2016, net of the repayment of Series CI Notes, as described in *Section 7.4*.

Fixed-rate debt as a proportion of total indebtedness was 92% as at December 31, 2016, down from 97% one year earlier, mainly due to an increase in issued commercial paper and the amounts drawn on the TELUS International credit facility.

Net debt to EBITDA – excluding restructuring and other costs ratio was 2.69 times, as measured for December 31, 2016, up slightly from one year earlier. Our long-term objective for this measure is within a range of 2.00 to 2.50 times, which we believe is consistent with maintaining investment grade credit ratings in the range of BBB+, or the equivalent and providing reasonable access to capital. As at December 31, 2016, this ratio remains outside of the long-term objective range due to prior issuance of incremental debt primarily for the acquisition in 2014 and 2015 of spectrum licences for approximately \$3.6 billion, which were auctioned in unprecedented amounts and in atypical concentrations during those years, partially offset by growth in EBITDA – excluding restructuring and other costs. These acquired licences have more than doubled our national spectrum holdings and represent an investment to extend our network capacity to support continuing data consumption growth, as well as growth in our wireless customer base. We will endeavour to return this ratio to within the objective range in the medium term, as we believe that this range is supportive of our long-term strategy. While this ratio exceeds our long-term objective range, we are well in compliance with the leverage ratio covenant in our credit facilities, which states that we may not permit our net debt to operating cash flow ratio to exceed 4.00:1.00 (see *Section 7.6 Credit facilities*).

EBITDA – excluding restructuring and other costs

(\$ millions)



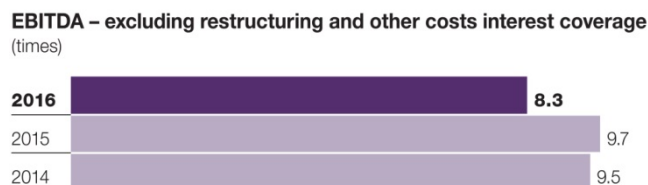
EBITDA is a non-GAAP measure.

Liquidity and capital resource measures

As at, or years ended, December 31	2016	2015	Change
Components of debt and coverage ratios¹ (\$ millions)			
Net debt	12,652	11,953	699
EBITDA – excluding restructuring and other costs	4,708	4,488	220
Net interest cost	566	465	101
Debt ratios			
Fixed-rate debt as a proportion of total indebtedness (%)	92	97	(5) pts.
Average term to maturity of long-term debt (excluding commercial paper) (years)	10.4	11.1	(0.7)
Weighted average interest rate on long-term debt (excluding commercial paper) (%)	4.22	4.32	(0.10) pts.
Net debt to EBITDA – excluding restructuring and other costs ¹ (times)	2.69	2.66	0.03
Coverage ratios¹ (times)			
Earnings coverage	4.0	4.8	(0.8)
EBITDA – excluding restructuring and other costs interest coverage	8.3	9.7	(1.4)
Other measures¹ (%)			
Dividend payout ratio of adjusted net earnings	77	73	4 pts.
Dividend payout ratio	89	73	16 pts.
1 See Section 11.1 Non-GAAP and other financial measures.			

Earnings coverage ratio for 2016 was 4.0 times, down from 4.8 times one year earlier. A decrease in income before borrowing costs and income taxes reduced the ratio by 0.5, while an increase in borrowing costs reduced the ratio by 0.3.

EBITDA – excluding restructuring and other costs interest coverage ratio for 2016 was 8.3 times, down from 9.7 times one year earlier. An increase in net interest costs reduced the ratio by 1.8, while growth in EBITDA – excluding restructuring and other costs increased the ratio by 0.4.



Dividend payout ratios: Actual dividend payout decisions will continue to be subject to our Board’s assessment and the determination of our financial position and outlook, as well as our long-term dividend payout ratio guideline of 65 to 75% of prospective net earnings per share. The disclosed basic and adjusted dividend payout ratios are historical measures utilizing the last four quarters of dividends declared and earnings per share. We estimate that we are within our target guideline on a prospective dividend payout ratio basis. The historical measures for the year ended December 31, 2016 are presented for illustrative purposes in evaluating our target guideline and both exceeded the objective range.

7.6 Credit facilities

At December 31, 2016, we had available liquidity of more than \$1.7 billion from unutilized credit facilities, including the TELUS revolving credit facility, approximately \$96 million available liquidity from the TELUS International credit facility and \$131 million available from uncommitted letters of credit facilities. In addition, we had \$400 million available under our trade receivables securitization program (see Section 7.7 Sale of trade receivables). We are well within our objective of generally maintaining at least \$1.0 billion of available liquidity.

TELUS revolving credit facility

We have a \$2.25 billion (or U.S. dollar equivalent) revolving credit facility with a syndicate of financial institutions that was renewed in the second quarter of 2016 and expires on May 31, 2021. The revolving credit facility is used for general corporate purposes, including the backstop of commercial paper, as required.

TELUS revolving credit facility at December 31, 2016

(\$ millions)	Expiry	Size	Drawn	Outstanding undrawn letters of credit	Backstop for commercial paper program	Available liquidity
Five-year revolving facility ¹	May 31, 2021	2,250	—	—	(613)	1,637
1 Canadian dollars or U.S. dollar equivalent.						

Our revolving credit facility contains customary covenants, including a requirement that we not permit our consolidated leverage ratio to exceed 4.00 to 1.00 and that we not permit our consolidated coverage ratio to be less than 2.00 to 1.00, at the end of any financial quarter. Our consolidated leverage ratio was approximately 2.69 to 1.00 as at December 31, 2016, and our consolidated coverage ratio was approximately 8.32 to 1.00 as at December 31, 2016. These ratios are expected to remain well above the covenants. There are certain minor differences in the calculation of the leverage ratio and coverage ratio under the revolving credit facility, as compared with the calculation of Net debt to EBITDA – excluding restructuring and other costs and EBITDA – excluding restructuring and other costs interest coverage. Historically, the calculations have not been materially different. The covenants are not impacted by revaluation, if any, of Property, plant and equipment, Intangible assets or Goodwill for accounting purposes. Continued access to our credit facilities is not contingent on maintaining a specific credit rating.

Commercial paper

TELUS Corporation has an unsecured commercial paper program, which is backstopped by our revolving credit facility, enabling us to issue commercial paper up to a maximum aggregate amount of \$1.4 billion at December 31, 2016, including a U.S. dollar denominated commercial paper program for up to U.S.\$1.0 billion within this maximum aggregate amount. The commercial paper program is to be used for general corporate purposes, including, but not limited to, capital expenditures and investments. Our ability to reasonably access the commercial paper market in Canada and the U.S. is dependent on our credit ratings (see *Section 7.8 Credit ratings*).

TELUS International (Cda) Inc. credit facilities

As at December 31, 2016, TELUS International (Cda) Inc. had a U.S.\$330 million bank credit facility, secured by its assets, expiring on May 31, 2021, with a syndicate of financial institutions. The credit facility is comprised of a revolving U.S.\$115 million component and a U.S.\$215 million term loan component. The credit facility is non-recourse to TELUS Corporation. As at December 31, 2016, \$340 million (\$332 million net of unamortized issue costs) was outstanding, all of which was denominated in U.S. dollars (U.S.\$253 million), with a weighted average interest rate of 2.49%.

Other letter of credit facilities

At December 31, 2016, we had \$210 million of letters of credit outstanding (December 31, 2015 – \$202 million), issued under various uncommitted facilities; such letter of credit facilities are in addition to the ability to provide letters of credit pursuant to our committed bank credit facility. Available liquidity under various uncommitted letters of credit facilities was \$131 million at December 31, 2016.

7.7 Sale of trade receivables

TELUS Communications Inc., a wholly owned subsidiary of TELUS, is a party to an agreement with an arm’s-length securitization trust associated with a major Schedule I Canadian bank, under which it is able to sell an interest in certain trade receivables for an amount up to a maximum of \$500 million. The agreement is in effect until December 31, 2018, and available liquidity was \$400 million as at December 31, 2016. (See *Note 22* of the Consolidated financial statements.) Sales of trade receivables in securitization transactions are recognized as collateralized Short-term borrowings and thus do not result in our de-recognition of the trade receivables sold.

TELUS Communications Inc. is required to maintain at least a BB credit rating by DBRS Ltd., or the securitization trust may require the sale program to be wound down prior to the end of the term. The necessary credit rating was exceeded as of February 9, 2017.

7.8 Credit ratings

There were no changes to our investment grade credit ratings during 2016, or as of February 9, 2017. We believe adherence to most of our stated financial policies (see *Section 4.3*), coupled with our efforts to maintain a constructive relationship with banks, investors and credit rating agencies, continues to provide reasonable access to capital markets. (See discussion of risks in *Section 10.7 Financing and debt requirements and returning cash to shareholders*.)

7.9 Financial instruments, commitments and contingent liabilities

Financial instruments

Our financial instruments and the nature of certain risks that they may be subject to are set out below and described in *Note 4* of the Consolidated financial statements. Our policies in respect of the recognition and measurement of financial instruments are described in *Note 1(c)* of the Consolidated financial statements.

Financial instrument	Recognition and measurement accounting classification	Risks				
		Credit	Liquidity	Market risks		
				Currency	Interest rate	Other price
Measured at amortized cost						
Accounts receivable	Loans and receivables	X		X		
Construction credit facilities advances to real estate joint venture	Loans and receivables				X	
Short-term obligations	Other financial liabilities		X	X	X	
Accounts payable	Other financial liabilities		X	X		
Provisions	Other financial liabilities		X	X		X
Long-term debt	Other financial liabilities		X	X	X	
Measured at fair value						
Cash and temporary investments	Fair value through Net income	X		X	X	
Long-term investments (not subject to significant influence) ¹	Available-for-sale			X		X
Foreign exchange derivatives ²	Fair value through Net income; part of a cash flow hedging relationship	X	X	X		
Share-based compensation derivatives ²	Fair value through Net income; part of a cash flow hedging relationship	X	X			X
<p>1 Long-term investments over which we do not have significant influence are measured at fair value if those fair values can be reliably measured.</p> <p>2 Use of derivative financial instruments is subject to a policy which requires that no derivative transaction is to be entered into for the purpose of establishing a speculative or leveraged position (the corollary being that all derivative transactions are to be entered into for risk management purposes only) and sets criteria for the creditworthiness of the transaction counterparties.</p>						

Credit risk

Credit risk arises from Cash and temporary investments, Accounts receivable and derivative financial instruments. We mitigate credit risk as follows:

- Credit risk associated with Cash and temporary investments is managed by ensuring that these financial assets are placed with governments, major financial institutions that have been accorded strong investment grade ratings by a primary rating agency, and/or other creditworthy counterparties. An ongoing review is performed to evaluate changes in the status of counterparties.
- Credit risk associated with Accounts receivable is inherently managed by the size and diversity of our large customer base, which includes substantially all consumer and business sectors in Canada. We follow a program of credit evaluations of customers and limit the amount of credit extended when deemed necessary. As at December 31, 2016, the weighted average life of past-due customer Accounts receivable was 61 days (2015 – 62 days).

We maintain allowances for potential credit losses related to doubtful accounts. Current economic conditions, historical information, reasons for the accounts being past-due and line of business from which the customer Accounts receivable arose are all considered when determining whether to make allowances for past-due accounts. The same factors are considered when determining whether to write off amounts charged to the allowance for doubtful accounts against the customer Accounts receivable. The doubtful accounts expense is calculated on a specific-identification basis for customer Accounts receivable over a specific balance threshold and on a statistically derived allowance basis for the remainder. No customer Accounts receivable are written off directly to the doubtful accounts expense.

- Counterparties to our share-based compensation cash-settled equity forward agreements and foreign exchange derivatives are major financial institutions that have been accorded investment grade ratings by a primary rating

agency. The dollar amount of credit exposure under contracts with any one financial institution is limited and counterparties’ credit ratings are monitored. We do not give or receive collateral on swap agreements and hedging items due to our credit rating and those of our counterparties. While we are exposed to potential credit losses due to the possible non-performance of our counterparties, we consider this risk remote. Our derivative liabilities do not have credit risk-related contingent features.

Liquidity risk

Liquidity risk is the risk that we may not have cash available to satisfy our financial obligations as they come due. As a component of our capital structure financial policies, discussed in *Section 4.3 Liquidity and capital resources*, we manage liquidity risk by: maintaining a daily cash pooling process that enables us to manage our available liquidity and our liquidity requirements according to our actual needs; maintaining an agreement to sell trade receivables to an arm’s-length securitization trust; maintaining bilateral bank facilities and syndicated credit facilities; maintaining a commercial paper program; maintaining an in-effect shelf prospectus; continuously monitoring forecast and actual cash flows; and managing maturity profiles of financial assets and financial liabilities.

Our debt maturities in future years are as disclosed in the long-term debt principal maturities chart in *Section 4.3*. As at December 31, 2016, we had liquidity of more than \$1.7 billion available from unutilized credit facilities (see *Section 7.6 Credit facilities*), \$400 million available under our trade receivables securitization program (see *Section 7.7 Sale of trade receivables*), and we could offer \$2.2 billion of debt or equity securities pursuant to a shelf prospectus that is in effect until April 2018. This adheres to our objective of generally maintaining at least \$1 billion of available liquidity. We believe that our investment grade credit ratings contribute to reasonable access to capital markets.

The expected maturities of our undiscounted financial liabilities do not differ significantly from the contractual maturities, other than as shown in the table in *Note 4(c)* of the Consolidated financial statements.

Currency risk

Our functional currency is the Canadian dollar, but certain routine revenues and operating costs are denominated in U.S. dollars and some inventory purchases and capital asset acquisitions are sourced internationally. The U.S. dollar is the only foreign currency to which we have a significant exposure.

Our foreign exchange risk management includes the use of foreign-currency forward contracts and currency options to fix the exchange rates on short-term U.S. dollar denominated transactions, commitments and commercial paper.

We are also exposed to currency risks in that the fair value or future cash flows of our U.S. Dollar Notes and our TELUS International credit facility U.S. dollar borrowings could fluctuate because of changes in foreign exchange rates. Currency hedging relationships have been established for the related semi-annual interest payments and principal payment at maturity in respect of the U.S. Dollar Notes.

Interest rate risk

Changes in market interest rates will cause fluctuations in the fair values or future cash flows of temporary investments, construction credit facility advances made to the real estate joint ventures, short-term obligations, long-term debt and interest rate swap derivatives.

When we have temporary investments, they have short maturities and fixed interest rates and as a result, their fair values will fluctuate with changes in market interest rates; absent monetization prior to maturity, the related future cash flows will not change due to changes in market interest rates.

If the balance of short-term investments includes dividend-paying equity instruments, we could be exposed to interest rate risk.

Due to the short-term nature of the applicable rates of interest charged, the fair value of the construction credit facilities advances made to the real estate joint venture is not materially affected by changes in market interest rates; associated cash flows representing interest payments will be affected until such advances are repaid.

As short-term obligations arising from bilateral bank facilities, which typically have variable interest rates, are rarely outstanding for periods that exceed one calendar week, interest rate risk associated with this item is not material.

Short-term borrowings arising from the sales of trade receivables to an arm’s-length securitization trust are fixed-rate debt. Due to the short maturities of these borrowings, interest rate risk associated with this item is not material.

All of our currently outstanding long-term debt, other than commercial paper and amounts drawn on our credit facilities, is fixed-rate debt (see *Section 7.5*). The fair value of fixed-rate debt fluctuates with changes in market interest rates; absent early redemption, the related future cash flows will not change. Due to the short maturities of commercial paper, its fair value is not materially affected by changes in market interest rates, but the associated cash flows representing interest payments may be affected if the commercial paper is rolled over.

Amounts drawn on our short-term and long-term credit facilities will be affected by changes in market interest rates in a manner similar to commercial paper.

Other price risk

- Long-term investments: We are exposed to equity price risk arising from investments classified as available-for-sale. Such investments are held for strategic rather than trading purposes.
- Share-based compensation derivatives: We are exposed to other price risk arising from cash-settled share-based compensation (appreciating Common Share prices increase both the expense and the potential cash outflow). Certain cash-settled equity swap agreements have been entered into that fix the cost associated with our restricted stock units (see *Note 13(b)* of the Consolidated financial statements).

Market risks

Net income and Other comprehensive income for the years ended December 31, 2016 and 2015 could have varied if the Canadian dollar: U.S. dollar exchange rate and our Common Share price varied by reasonably possible amounts from their actual statement of financial position date amounts.

The sensitivity analysis of our exposure to market risks is shown in *Note 4(g)* of the Consolidated financial statements.

Fair values – General

The carrying values of Cash and temporary investments, Accounts receivable, short-term obligations, Short-term borrowings, accounts payable and certain provisions (including restructuring accounts payable) approximate their fair values due to the immediate or short-term maturity of these financial instruments. The fair values are determined directly by reference to quoted market prices in active markets.

The carrying values of our investments accounted for using the cost method do not exceed their fair values. The fair values of our investments accounted for as available-for-sale are based on quoted market prices in active markets or other clear and objective evidence of fair value.

The fair value of our Long-term debt is based on quoted market prices in active markets.

The fair values of the derivative financial instruments we use to manage our exposure to currency risks are estimated based upon quoted market prices in active markets for the same or similar financial instruments or on the current rates offered to us for financial instruments of the same maturity, as well as discounted future cash flows determined using current rates for similar financial instruments subject to similar risks and maturities (such fair value estimates being largely based on the Canadian dollar: U.S. dollar forward exchange rate as at the statement of financial position dates).

The fair values of the derivative financial instruments we use to manage our exposure to increases in compensation costs arising from certain forms of share-based compensation are based upon fair value estimates of the related cash-settled equity forward agreements provided by the counterparty to the transactions (such fair value estimates being largely based on our Common Share price as at the statement of financial position dates).

The financial instruments that we measure at fair value on a recurring basis in periods subsequent to initial recognition and the level within the fair value hierarchy at which they are measured are as set out in *Note 4(h)* of the Consolidated financial statements.

Fair values – Derivative and non-derivative

The derivative financial instruments that we measure at fair value on a recurring basis subsequent to initial recognition, and our Long-term debt, which is measured at amortized cost, and the fair value thereof, are set out in tables in *Note 4(h)* of the Consolidated financial statements.

Recognition of derivative gains and losses

Gains and losses, excluding income tax effects, on derivative instruments that are classified as cash flow hedging items, as well as gains and losses on derivative instruments that are classified as held for trading items and that are not designated as being in a hedging relationship, and their respective locations within the Consolidated statements of income and other comprehensive income, are detailed in *Note 4(i)* of the Consolidated financial statements.

Commitments and contingent liabilities

Contractual obligations as at December 31, 2016

(\$ millions)	2017	2018	2019	2020	2021	Thereafter	Total
Short-term borrowings							
Interest obligations	1	2	—	—	—	—	3
Principal obligations ¹	—	100	—	—	—	—	100
	1	102	—	—	—	—	103
Long-term debt							
Interest obligations	505	486	484	433	353	3,529	5,790
Principal maturities ²	1,327	264	1,014	1,014	1,358	8,055	13,032
	1,832	750	1,498	1,447	1,711	11,584	18,822
Construction credit facilities commitment ³	93	—	—	—	—	—	93
Minimum operating lease payments ^{3,4}	217	198	183	160	138	819	1,715
Occupancy costs ³	90	90	86	81	78	444	869
Purchase obligations ⁵							
Operating expenditures	522	143	113	90	69	265	1,202
Property, plant and equipment, and Intangible assets	456	27	24	11	—	—	518
	978	170	137	101	69	265	1,720
Non-interest bearing financial liabilities	1,949	227	16	9	9	5	2,215
Other obligations	12	—	—	—	—	(9)	3
Total	5,172	1,537	1,920	1,798	2,005	13,108	25,540

1 See Section 7.7 Sale of trade receivables.

2 See Long-term debt maturity chart in Section 4.3.

3 Construction credit facilities reflect loan amounts for a real estate joint venture, a related party. Minimum operating lease payments and occupancy costs include transactions with real estate joint ventures. See Section 7.11 Transactions between related parties.

4 Total minimum operating lease payments include approximately 34% in respect of our five largest leases for office premises over various terms, with expiry dates that range between 2024 and 2036 with a weighted average term of approximately 14 years; and approximately 30% in respect of wireless site leases with a weighted average term of approximately 17 years. Total minimum operating lease payments with related parties are immaterial. See Note 19 of the Consolidated financial statements.

5 Where applicable, purchase obligations reflect foreign exchange rates at December 31, 2016. Purchase obligations include future operating and capital expenditures that have been contracted for at the current year-end and include the most likely estimates of prices and volumes, where necessary. As purchase obligations reflect market conditions at the time the obligation was incurred for the items being purchased, they may not be representative of future years. Obligations from personnel supply contracts and other such labour agreements have been excluded.

Claims and lawsuits

A number of claims and lawsuits (including class actions and intellectual property infringement claims) seeking damages and other relief are pending against us and, in some cases, numerous other wireless carriers and telecommunications service providers. As well, we have received notice of, or are aware of, certain possible claims (including intellectual property infringement claims) against us. (See the related risk discussion in Section 10.9 Litigation and legal matters.)

It is not currently possible for us to predict the outcome of such claims, possible claims and lawsuits due to various factors, including: the preliminary nature of some claims; uncertain damage theories and demands; an incomplete factual record; uncertainty concerning legal theories, procedures and their resolution by the courts, at both the trial and the appeal levels; and the unpredictable nature of opposing parties and their demands. However, when it is determined in respect of a particular claim that payments to claimants are probable, we accrue an estimate of the liability.

Subject to the foregoing limitations, management is of the opinion, based upon legal assessments and information presently available, that it is unlikely that any liability, to the extent not provided for through insurance or otherwise, would have a material effect on our financial position and the results of our operations, including cash flows, with the exception of the items disclosed in Note 29(a) of the Consolidated financial statements. This is a significant judgment for us (see Section 8.1 Critical accounting estimates).

Indemnification obligations

In the normal course of operations, we provide indemnification in conjunction with certain transactions. The terms of these indemnification obligations range in duration. These indemnifications would require us to compensate the indemnified parties for costs incurred as a result of failure to comply with contractual obligations or litigation claims or

statutory sanctions or damages that may be suffered by an indemnified party. In some cases, there is no maximum limit on these indemnification obligations. The overall maximum amount of an indemnification obligation will depend on future events and conditions and therefore cannot be reasonably estimated. Where appropriate, an indemnification obligation is recorded as a liability. Other than obligations recorded as liabilities at the time of such transactions, historically we have not made significant payments under these indemnifications.

As at December 31, 2016, we had no liability recorded in respect of our indemnification obligations.

7.10 Outstanding share information

Outstanding shares (millions)	December 31, 2016	January 31, 2017
Common Shares	590	590
Common Share options – all exercisable (one for one)	1	1

7.11 Transactions between related parties

Investments in significant controlled entities

As at December 31, 2016, TELUS Corporation controlled 100% of the equity of TELUS Communications Inc., which, in turn, ultimately controlled 100% of TELUS Communications Company and TELE-MOBILE COMPANY. This is unchanged from December 31, 2015.

Transactions with key management personnel

Our key management personnel have authority and responsibility for overseeing, planning, directing and controlling our activities. They consist of our Board of Directors and our Executive Leadership Team. Total compensation expense amounts for key management personnel were \$54 million in 2016, as compared to \$65 million in 2015. See *Note 30(a)* of the Consolidated financial statements for additional detail.

Transactions with defined benefit pension plans

We provided management and administrative services to our defined benefit pension plans. Charges for these services were on a cost recovery basis and were immaterial.

Transactions with real estate joint ventures

In 2016, we had transactions with real estate joint ventures, which are related parties to us, as set out in *Note 21* of our Consolidated financial statements. As at December 31, 2016, the proportion of space leased in the TELUS Garden office tower was approximately 99%. Closing was completed for the majority of residential units in the TELUS Garden residential condominium project in the fourth quarter of 2016, with the remaining units expected to close in 2017.

For the TELUS Sky™ real estate joint venture, commitments and contingent liabilities include construction-related contractual commitments through to 2018 (approximately \$121 million at December 31, 2016) and construction credit facilities (\$342 million with three Canadian financial institutions as 66 2/3% lender and TELUS as 33 1/3% lender).

8. Accounting matters

8.1 Critical accounting estimates

Our significant accounting policies are described in *Note 1* of the Consolidated financial statements for the year ended December 31, 2016. The preparation of financial statements in conformity with generally accepted accounting principles (GAAP) requires us to make estimates, assumptions and judgments that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities as at the date of the financial statements, as well as the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates. Our critical accounting estimates and significant judgments are generally discussed with the Audit Committee each quarter.

Examples of significant judgments, apart from those involving estimation, include the following:

- Assessments about whether line items are sufficiently material to warrant separate presentation in the primary financial statements and, if not, whether they are sufficiently material to warrant separate presentation in the notes to the financial statements. In the normal course, we make changes to our assessments regarding materiality for presentation so that they reflect current economic conditions. Due consideration is given to the view that it is reasonable to expect differing opinions of what is, and is not, material.
- In respect of revenue-generating transactions, we must make judgments that affect the timing of the recognition of revenue. See *Section 8.2 Accounting policy developments* below and *Note 2* of our Consolidated financial statements for significant changes to IFRS-IASB, which are not yet effective and have not yet been applied, but which will significantly affect the timing of the recognition of revenue and the classification of our revenues presented as either service or equipment revenues.
 - We must make judgments about when we have satisfied our performance obligations to our customers, either over a period of time or at a point in time. Service revenues are recognized based upon customers’ access to, or usage of, our telecommunications infrastructure; we believe this method faithfully depicts the transfer of the services, and thus the revenues are recognized as the services are made available and/or rendered. We consider our performance obligations arising from the sale of equipment to have been satisfied when the equipment has been delivered to, and accepted by, the end-user customers.
 - Principally in the context of revenue-generating transactions involving wireless handsets, we must make judgments about whether third-party re-sellers that deliver equipment to our customers are acting in the transaction as principals or as our agents. Upon due consideration of the relevant indicators, we believe the decision to consider the re-sellers to be acting, solely for accounting purposes, as our agents is more representative of the economic substance of the transactions, as we are the primary obligor to the end-user customers. The effect of this judgment is that no equipment revenue is recognized upon the transfer of inventory to third-party resellers.
- The decision to depreciate and amortize any property, plant, equipment and intangible assets that are subject to amortization, on a straight-line basis, as we believe that this method reflects the consumption of resources related to the economic lifespan of those assets better than an accelerated method and is more representative of the economic substance of the underlying use of those assets.
- The preparation of financial statements in accordance with GAAP requires management to make judgments that affect the financial statement disclosure of information regularly reviewed by our chief operating decision-maker used to make resource allocation decisions and to assess performance (segment information, see *Note 5* of our Consolidated financial statements). A significant judgment we make is in respect of distinguishing between our wireless and wireline operations and cash flows, such distinction having been significantly affected by the convergence and integration of our wireless and wireline telecommunications infrastructure technology and operations.

Through December 31, 2015, our judgment was that our wireless and wireline telecommunications infrastructure technology and operations had not experienced sufficient convergence to objectively make their respective operations and cash flows practically indistinguishable. The continued build-out of our technology-agnostic fibre-optic infrastructure, in combination with converged edge network technology, has significantly affected this judgment, as has the commercialization of fixed-wireless solutions.

It has become increasingly impractical to objectively distinguish between our wireless and wireline operations and cash flows, and the assets from which those cash flows arise. Our judgment as to whether these operations can continue to be judged to be individual components of the business and discrete operating segments may change in the future.

The increasing impracticality of objectively distinguishing between our wireless and wireline cash flows, and the assets from which those cash flows arise, is evidence of their increasing interdependence; this may result in the unification of the wireless cash-generating unit and the wireline cash-generating unit as a single cash-generating unit for impairment testing purposes in the future.

- The view that our spectrum licences granted by Innovation, Science and Economic Development Canada (ISED) will likely be renewed by ISED, that we intend to renew them, that we believe we have the financial and operational ability to renew them and, thus, that they have an indefinite life, as discussed further in *Note 18(b)* of the Consolidated financial statements.
- In connection with the annual impairment testing of Intangible assets with indefinite lives and Goodwill, there are instances in which we must exercise judgment in allocating our net assets, including shared corporate and administrative assets, to our cash-generating units when determining their carrying amounts. These judgments are necessary because of the convergence our wireless and wireline telecommunications infrastructure technology and operations have experienced to date, and because of our continuous development. There are instances in which similar judgments must also be made in respect of future capital expenditures in support of both wireless and wireline operations, which are a component of the determination of recoverable amounts that are used in the annual impairment testing, as discussed further in *Note 18(c)* of the Consolidated financial statements.
- In respect of claims and lawsuits, as discussed further in *Note 29(a)* of the Consolidated financial statements, the determination of whether an item is a contingent liability or whether an outflow of resources is probable and thus needs to be accounted for as a provision.

Examples of the significant estimates and judgments that we make, and their relative significance and degree of difficulty, are as set out in the graphic in *Note 1* of the Consolidated financial statements.

Our critical accounting estimates and assumptions are described below.

General

- In determining our critical accounting estimates, we consider trends, commitments, events or uncertainties that we reasonably expect to materially affect the methodology or assumptions. Our statements in this MD&A regarding such consideration are made subject to the *Caution regarding forward-looking statements*.
- In the normal course, we make changes to assumptions underlying all critical accounting estimates so that they reflect current economic conditions, updated historical information used to develop the assumptions, and changes in our credit ratings, where applicable. Unless indicated otherwise in the discussion below, we expect that no material changes in overall financial performance and financial statement line items would arise either from reasonably likely changes in material assumptions underlying the estimate or from selection of a different estimate from within a range of valid estimates.
- Our critical accounting estimates affect line items on the Consolidated statements of income and other comprehensive income, and line items on the Consolidated statements of financial position, as follows:

Consolidated statements of financial position	Consolidated statements of income and other comprehensive income					
	Operating revenues	Operating expenses			Financing costs	Employee defined benefit plans re-measurements ²
		Goods and services purchased	Employee benefits expense	Amortization of intangible assets Depreciation		
Intangible assets, net, and Goodwill, net				X ¹		
Employee defined benefit pension plans			X	X ³	X	X
Property, plant and equipment, net				X		
Provisions for asset retirement obligations		X		X	X	
Investments	X					
Accounts receivable		X				
Inventories		X				

1 Accounting estimate, as applicable to Intangible assets with indefinite lives and Goodwill, primarily relates to spectrum holdings and accordingly affects our wireless cash-generating unit.
 2 Other comprehensive income – Item never subsequently reclassified to income.
 3 Accounting estimate impact due to internal labour capitalization rates.

- All critical accounting estimates are uncertain at the time an estimate is made and affect the following Consolidated statements of income and other comprehensive income line items: Income taxes (except for estimates about Goodwill) and Net income. Similarly, all critical accounting estimates affect the following Consolidated statements of financial position line items: Current assets (Income and other taxes receivable), Current liabilities (Income and other taxes payable), Deferred income tax liabilities and Common equity (retained earnings) and Non-controlling interest. The discussion of each critical accounting estimate does not differ between our two segments, wireless and wireline, unless explicitly noted.

Intangible assets, net; Goodwill, net; and Property, plant and equipment, net

General

- The Intangible assets, net, line item represents approximately 37% of Total assets as at December 31, 2016 (38% as at December 31, 2015). Included in Intangible assets are spectrum licences, which represent approximately 31% of Total assets as at December 31, 2016 (32% as at December 31, 2015).
- The Goodwill, net, line item represents approximately 14% of Total assets as at December 31, 2016 and 2015.
- The Property, plant and equipment, net, line item on our Consolidated statements of financial position represents approximately 38% of Total assets as at December 31, 2016 and 37% of Total assets as at December 31, 2015.
- If our estimated useful lives of assets were incorrect, we could experience increased or decreased charges for amortization or depreciation in the future. If the future were to differ adversely from our best estimate of key economic assumptions and associated cash flows were to materially decrease, we could potentially experience future material impairment charges in respect of our Property, plant and equipment assets, our Intangible assets or our Goodwill. If Intangible assets with indefinite lives were determined to have finite lives at some point in the future, we could experience increased charges for amortization of Intangible assets. Such charges in and of themselves do not result in a cash outflow and would not immediately affect our liquidity.

The recoverability of Intangible assets with indefinite lives; the recoverability of Goodwill

- The carrying values of Intangible assets with indefinite lives and Goodwill are periodically tested for impairment and this test represents a significant estimate for us.
- The recoverable amounts of the cash-generating units’ assets have been determined based on a fair value less costs of disposal calculation (in 2015, a value-in-use calculation was used). There is a material degree of uncertainty with respect to the estimates of the recoverable amounts of the cash-generating units’ assets given the necessity of making key economic assumptions about the future. The fair value less costs of disposal and value-in-use calculations both use future cash flows and growth projections (including judgments about the allocation of future capital expenditures supporting both wireless and wireline operations); associated economic risk assumptions and estimates of achieving key operating metrics and drivers; estimates of future generational infrastructure capital expenditures; and the future weighted average cost of capital.
- See *Note 18(c)* of the Consolidated financial statements for further discussion of methodology and sensitivity testing.

The estimated useful lives of assets; the recoverability of tangible assets

- The estimated useful lives of assets are determined by a continuing program of asset life studies. The recoverability of assets with finite lives is significantly impacted by the estimated useful lives of assets.
- Assumptions underlying the estimated useful lives of assets include the life cycle of technology, competitive pressures and future infrastructure utilization plans.

Employee defined benefit pension plans

Certain actuarial and economic assumptions used in determining defined benefit pension costs, accrued pension benefit obligations and pension plan assets

- We review industry practices, trends, economic conditions and data provided by actuaries when developing assumptions used in the determination of defined benefit pension costs and accrued pension benefit obligations. Pension plan assets are generally valued using market prices, however, some assets are valued using market estimates when market prices are not readily available. Actuarial support is obtained for interpolations of experience gains and losses that affect the employee defined benefit plan actuarial gains and losses and accrued pension benefit obligations. The discount rate, which is used to determine the accrued benefit obligation, is based upon the yield on long-term, high-quality fixed-term investments. The discount rate is set annually at the end of each calendar year, based upon yields on long-term corporate bond indices in consultation with actuaries, and is reviewed quarterly for significant changes. Future increases in compensation are based upon the current benefits policies and economic forecasts. We have examined our respective pension obligation and current service cost durations and observed a 10-year difference in duration. As individual discount rates will more accurately reflect the obligation and current service cost, commencing in 2017, we will be applying a dual discount rate methodology.

- On an annual basis, at a minimum, the defined benefit pension plan assumptions are assessed and revised as appropriate. When the defined benefit pension plan key assumptions fluctuate significantly relative to their immediately preceding year-end values, actuarial gains (losses) arising from such significant fluctuations are recognized on an interim basis. Assumptions used in determining defined benefit pension costs, accrued pension benefit obligations and pension plan assets include life expectancy, discount rates, market estimates and rates of future compensation increases. Material changes in overall financial performance and financial statement line items would arise from reasonably likely changes, because of assumptions that have been revised to reflect updated historical information and updated economic conditions, in the material assumptions underlying this estimate. See *Note 14* of the Consolidated financial statements for further analysis.
- This accounting estimate related to employee defined benefit pension plans is in respect of components of the Operating expenses line item, Financing costs line item and Other comprehensive income line item on our Consolidated statements of income and other comprehensive income. If the future were to adversely differ from our best estimate of assumptions used in determining defined benefit pension costs, accrued benefit obligations and pension plan assets, we could experience future increased (or decreased) defined benefit pension expense, financing costs and charges to Other comprehensive income.

Income tax assets and liabilities

The amount and composition of income tax assets and income tax liabilities, including the amount of unrecognized tax benefits

- Assumptions underlying the composition of income tax assets and liabilities are based upon an assessment of the technical merits of tax positions. Income tax benefits on uncertain tax positions are recognized only when it is more likely than not that the ultimate determination of the tax treatment of a position will result in the related benefit being realizable. Income tax assets and liabilities are measured at the amount that is expected to be realized or incurred upon ultimate settlement with taxation authorities. Such assessments are based upon the applicable income tax legislation, regulations, interpretations and jurisprudence, all of which in turn are subject to change and interpretation.
- Current income tax assets and liabilities are estimated based upon the amount of income tax that is calculated as being owed to taxation authorities, net of periodic instalment payments. Deferred income tax liabilities are composed of the tax effect of temporary differences between the carrying amount and tax basis of assets and liabilities, as well as the income tax effect of undeducted income tax losses. The timing of the reversal of temporary differences is estimated and the income tax rate substantively enacted for the periods of reversal is applied to the temporary differences. The carrying amounts of assets and liabilities are based upon the amounts recorded in the financial statements and are, therefore, subject to accounting estimates that are inherent in those balances. The tax basis of assets and liabilities, as well as the amount of undeducted income tax losses, are based upon the assessment and measurement of tax positions, as noted above. Assumptions as to the timing of reversal of temporary differences include expectations about the future results of operations and future cash flows. The composition of income tax liabilities is reasonably likely to change from period to period because of changes in the estimation of these significant uncertainties.
- This accounting estimate is in respect of material asset and liability line items on our Consolidated statements of financial position comprising less than 1% of Total assets as at December 31, 2016 and 2015, and approximately 8% of Total liabilities and owners’ equity as at December 31, 2016 (9% as at December 31, 2015). If the future were to adversely differ from our best estimate of the likelihood of tax positions being sustained, the amount of tax expected to be incurred, the future results of operations, the timing of reversal of deductible temporary differences and taxable temporary differences, and the tax rates applicable to future years, we could experience material deferred income tax adjustments. Such deferred income tax adjustments could result in an increase or acceleration of cash outflows at an earlier time than might otherwise be expected.

Provisions for asset retirement obligations

Certain economic assumptions used in provisioning for asset retirement obligations

- Asset retirement obligation provisions are recognized for statutory, contractual or legal obligations, normally when incurred, associated with the retirement of Property, plant and equipment (primarily certain items of outside plant and wireless site equipment) when those obligations result from the acquisition, construction, development and/or normal operation of the assets. The obligations are measured initially at fair value, determined using present value methodology, and the resulting costs are capitalized as a part of the carrying value of the related asset.
- On an annual basis, at a minimum, assumptions underlying the provisions for asset retirement obligations include expectations, which may span numerous decades, about inflation, discount rates and any changes in the amount or timing of the underlying future cash flows. Material changes in financial position would arise from reasonably likely changes, because of assumptions that have been revised to reflect updated historical information and updated economic conditions, in the material assumptions underlying this estimate. The capitalized asset retirement cost is

depreciated on the same basis as the related asset, and the discount accretion is included in the Consolidated statements of income and other comprehensive income as a component of Financing costs.

- This accounting estimate is in respect of the asset retirement obligations component of the Provisions line item on our Consolidated statements of financial position, and this component comprises approximately 1% of Total liabilities and owners’ equity as at December 31, 2016 and 2015. If the provisions for asset retirement obligations were to be inadequate, we could experience a charge to Goods and services purchased in the future. A charge for an inadequate asset retirement obligation provision would result in a cash outflow proximate to the time that the asset retirement obligation is satisfied.

Investments

The recoverability of long-term investments

- We assess the recoverability of our long-term investments on a regular, recurring basis. The recoverability of investments is assessed on a specific-identification basis, taking into consideration expectations about future performance of the investments and comparison of historical results to past expectations.
- The most significant assumptions underlying the recoverability of long-term investments are related to the achievement of future cash flow and operating expectations. Our estimate of the recoverability of long-term investments could change from period to period due to the recurring nature of the recoverability assessment and due to the nature of long-term investments (we do not control the investees).
- Investments are included in the Other long-term assets line item on our Consolidated statements of financial position, which itself comprises approximately 2% of Total assets as at December 31, 2016 (2% as at December 31, 2015). If the allowance for recoverability of long-term investments were to be inadequate, we could experience an increased charge to Other operating income in the future. Such a provision for recoverability of long-term investments does not result in a cash outflow. When there is clear and objective evidence of an increase in the fair value of an investment, which may be indicated by either a recent sale of shares by another current investor or the injection of new cash into the entity from a new or existing investor, we recognize the after-tax increase in value in Other comprehensive income (change in unrealized fair value of available-for-sale financial assets).

Accounts receivable

General

- When determining our allowance for doubtful accounts, we consider the business area that gave rise to the Accounts receivable, conduct a statistical analysis of portfolio delinquency trends and perform specific account identification.
- These accounting estimates are in respect of the Accounts receivable line item on our Consolidated statements of financial position, which comprises approximately 5% of Total assets as at December 31, 2016 and 2015. If the future were to differ adversely from our best estimates of the fair value of the residual cash flows and the allowance for doubtful accounts, we could experience an increase in the doubtful accounts expense in the future. Such doubtful accounts expense in and of itself does not result in a cash outflow.

The allowance for doubtful accounts

- The estimate of our allowance for doubtful accounts could materially change from period to period due to the allowance being a function of the balance and composition of Accounts receivable, which can vary on a month-to-month basis. The variability of the balance of Accounts receivable arises from the variability of the amount and composition of Operating revenues and from the variability of Accounts receivable collection performance.

Inventories

The allowance for inventory obsolescence

- We determine our allowance for inventory obsolescence based upon expected inventory turnover, inventory aging, and current and future expectations with respect to product offerings.
- Assumptions underlying the allowance for inventory obsolescence include future sales trends and offerings and the expected inventory requirements and inventory composition necessary to support these future offerings. Our estimate of the allowance for inventory obsolescence could materially change from period to period due to changes in product offerings and the level of consumer acceptance of those products.
- This accounting estimate is in respect of the Inventories line item on our Consolidated statements of financial position, which comprises approximately 1% of Total assets as at December 31, 2016 and 2015. If the allowance for inventory obsolescence were to be inadequate, we could experience a charge to Goods and services purchased in the future. Such an inventory obsolescence charge does not result in a cash outflow.

8.2 Accounting policy developments

IFRS 9, Financial Instruments

IFRS 9, *Financial Instruments*, is required to be applied for years beginning on or after January 1, 2018. The new standard includes a model for the classification and measurement of financial instruments, a single forward-looking “expected loss” impairment model and a reformed approach to hedge accounting. Based upon current facts and circumstances, we do not expect our financial performance or disclosure to be materially affected by the application of the standard.

IFRS 15, Revenue from Contracts with Customers

IFRS 15, *Revenue from Contracts with Customers*, is required to be applied for years beginning on or after January 1, 2018, such date reflecting the one-year deferral approved by the International Accounting Standards Board (IASB) on July 22, 2015. The IASB and the United States Financial Accounting Standards Board (FASB) worked on this joint project to clarify the principles for the recognition of revenue. The new standard was released in May 2014 and supersedes existing standards and interpretations, including IAS 18, *Revenue*. In April 2016, the IASB issued *Clarifications to IFRS 15, Revenue from Contracts with Customers*, clarifying application of some of the more complex aspects of the standard. We are currently assessing the impacts and transition provisions of the new standard, however, we expect that we will apply the standard retrospectively to prior reporting periods, subject to permitted and elected practical expedients.

The effects of the new standard and the materiality of those effects will vary by industry and entity. Like many other telecommunications companies, we currently expect to be materially affected by its application, primarily in respect of the timing of revenue recognition, the classification of revenue, the capitalization of costs of obtaining a contract with a customer and possibly the capitalization of the costs of contract fulfilment (as defined by the new standard).

Revenue – timing of recognition; classification

The timing of revenue recognition and the classification of our revenues as either service revenues or equipment revenues will be affected, since the allocation of consideration in multiple element arrangements (solutions for our customers that may involve deliveries of multiple services and products that occur at different points in time and/or over different periods of time) will no longer be affected by the current limitation cap methodology.

The effects of the timing of revenue recognition and the classification of revenue are expected to be most pronounced in our wireless segment. Although the measurement of the total revenue recognized over the life of a contract will be largely unaffected by the new standard, the prohibition of the use of the limitation cap methodology will accelerate the recognition of total contract revenue, relative to both the associated cash inflows from customers and our current practice (using the limitation cap methodology). The acceleration of the recognition of contract revenue relative to the associated cash inflows will also result in the recognition of an amount reflecting the resulting difference as a contract asset. Although the underlying transaction economics would not differ, during periods of sustained growth in the number of wireless subscriber connection additions, assuming comparable contract-lifetime per unit cash inflows, revenues would appear to be greater than under the current practice (using the limitation cap methodology). Wireline segment results arising from transactions that include the initial provision of subsidized equipment or promotional pricing plans will be similarly affected.

Costs of contract acquisition; costs of contract fulfilment – timing of recognition

Similarly, the measurement of the total costs of contract acquisition and contract fulfilment over the life of a contract will not be affected by the new standard, but the timing of recognition will be. The new standard will result in our wireless and wireline segments’ costs of contract acquisition and contract fulfilment, to the extent that they are material, being capitalized and subsequently recognized as an expense over the life of a contract on a rational, systematic basis consistent with the pattern of the transfer of goods or services to which the asset relates. Although the underlying transaction economics would not differ, during periods of sustained growth in the number of customer connection additions, assuming comparable per-unit costs of contract acquisition and contract fulfilment, absolute profitability measures would appear to be greater than under the current practice (immediately expensing such costs).

Implementation

Our operations and associated systems are complex and our accounting for millions of multi-year contracts with our customers will be affected. Significantly, in order to effect the associated accounting, incremental compilation of historical data will be necessary for the millions of already existing multi-year contracts with our customers that are expected to be in-scope for purposes of transitioning to the new standard. Our current estimate of the time and effort necessary to develop and implement the accounting policies, estimates, judgments and processes (including critical incremental requirements of our information technology systems) we will need to have in place in order to comply with the new standard extends into mid/late-2017.

Once we have developed and implemented the necessary accounting policies, estimates, judgments and processes, we will commence the incremental compilation of historical data, as well as the accounting for that data, which is necessary to transition to, and to make reasonable quantitative estimates (which will also be subject to associated incremental internal controls over financial reporting) of the effects of, the new standard. As a result, at this time, it is not possible to make reasonable quantitative estimates of the effects of the new standard and we may not be able to do so prior to completing our December 31, 2017, annual Consolidated financial statements.

Illustrative example

To assist with understanding how the fundamental timing of recognition and classification of transactions will be affected by the new standard, we have developed an illustrative example, as shown in *Note 2(b)* of the Consolidated financial statements, to contrast the currently expected effects of applying the new standard on certain primary financial statement line items for a single consumer postpaid wireless 24-month contract (handset and service) involving a re-seller with the effects of applying our current accounting policies.

IFRS 16, Leases

IFRS 16, *Leases*, was released by the IASB in January 2016, is required to be applied for years beginning on or after January 1, 2019, and supersedes IAS 17, *Leases*. Earlier application is allowed, but not before the application of IFRS 15, *Revenue from Contracts with Customers*. The IASB and the FASB of the United States worked together to modify the accounting for leases, generally by eliminating lessees’ classification of leases as either operating leases or finance leases and, for IFRS-IASB, introducing a single lessee accounting model.

The most significant effect of the new standard will be the lessee’s recognition of the initial present value of unavoidable future lease payments as lease assets and lease liabilities on the statement of financial position, including those for most leases that would be currently accounted for as operating leases. Both leases with durations of 12 months or less and leases for low-value assets may be exempted.

The measurement of the total lease expense over the term of a lease will be unaffected by the new standard. However, the new standard will result in the timing of lease expense recognition being accelerated for leases that would be currently accounted for as operating leases; the IASB expects that this effect may be muted by a lessee having a portfolio of leases with varying maturities and lengths of term. The presentation on the statement of income and other comprehensive income required by the new standard will result in most lease expenses being presented as amortization of lease assets and financing costs arising from lease liabilities rather than as a part of goods and services purchased, thus reported operating income would be higher under the new standard.

Relative to the results of applying the current standard, although the actual cash flows will be unaffected, the lessee’s statement of cash flows will reflect increases in cash flows from operating activities offset equally by decreases in cash flows from financing activities. This is due to the payment of the “principal” component of leases that would be currently accounted for as operating leases being presented as a cash flow use within financing activities under the new standard.

We are currently assessing the impacts and transition provisions of the new standard; however, we expect that we will apply the standard retrospectively to prior reporting periods, subject to permitted and elected practical expedients; our current intention is to apply the new standard concurrent with our initial application of IFRS 15, *Revenue from Contracts with Customers*. Our current estimate of the time and effort necessary to develop and implement the accounting policies, estimates and processes (including incremental requirements of our information technology systems) we will need to have in place in order to comply with the new standard extends into late 2017. We expect that our Consolidated statement of financial position will be materially affected, as will those financial metrics related to both debt and results of operations; however, at this time it is not possible to make reasonable quantitative estimates of the effects of the new standard.

Other issued standards

Other issued standards required to be applied for periods beginning on or after January 1, 2017, are expected to have no significant effect on our financial performance or disclosure.

9. General trends, outlook and assumptions

This section contains forward-looking statements, which should be read together with the *Caution regarding forward-looking statements* at the beginning of this MD&A.

9.1 Telecommunications industry in 2016

We estimate that Canadian telecommunications industry revenues (including TV and excluding media) grew by about 2% to approximately \$60 billion in 2016. Wireless and data services again drove industry growth. Communication and entertainment consumption behaviours of consumers continued to demonstrate a strong preference for data-rich applications and data-intensive smartphones and tablets.

TELUS generated revenues of \$12.8 billion in 2016, representing approximately 21% of industry revenues, with wireless products and services representing 55% of our total revenues. In our wireline business, growth in business process outsourcing, high-speed Internet access, data and TV services has more than offset the decline in demand for legacy voice services.

Wireless

Based on publicly reported competitors’ results and estimates, the Canadian wireless industry experienced network revenue growth of approximately 5% in 2016 and EBITDA growth of approximately 4% in 2016. Growth in TELUS wireless network revenue was 3.9% in 2016, and growth in TELUS wireless EBITDA – excluding restructuring and other costs was 4.8% in 2016.

We estimate that the Canadian wireless industry added approximately one million new subscriber units in 2016 along with steady population growth, compared to approximately 780,000 in 2015. With industry additions in 2016, the wireless penetration rate increased to approximately 84% in Canada. We expect modest increases in the penetration rate to continue into 2017. In comparison, the rate in the United States is well over 100%, while in Europe and Asia it is even higher. This suggests an opportunity for continued growth in Canada.

In 2016, the wireless market was characterized by heightened retention and acquisition activity associated with the concurrent expiry of two-year and three-year contracts through June 2016 as a result of the Wireless Code, enacted in 2013, as well as a heightened level of competitive intensity. This led to higher industry retention and acquisition costs, exacerbated by the continued adoption of data-centric smartphones, accompanied by higher upfront device subsidies and higher device costs resulting from the depreciation of the Canadian dollar against the U.S. dollar in recent years. While this represents upfront pressure on industry margins, smartphones tend to generate higher average revenue per subscriber unit per month (ARPU), experience lower churn rates than earlier or more basic mobile devices, and result in higher average lifetime revenue.

The Canadian wireless industry continues to be highly competitive and capital intensive, characterized by ongoing consolidation. In March, Shaw Communications completed its previously announced acquisition of Wind Mobile, the last of the independent competitors that entered the wireless market after acquiring AWS spectrum in 2008, for \$1.6 billion. Shaw has since focused on commencing the build-out of an LTE network and in November 2016, it announced the launch of inner-city LTE networks in Toronto and Vancouver. At the same time, Shaw rebranded Wind Mobile as Freedom Mobile.

In May, BCE announced its intention to acquire Manitoba Telecom Services (MTS). At the same time, TELUS announced an agreement in principle with BCE to acquire a portion of MTS’ postpaid wireless subscribers and dealer locations in Manitoba upon completion of the purchase of MTS by BCE. On February 2, 2017, BCE announced that it expected to close its acquisition of MTS by the end of March 2017, subject to Competition Bureau and Industry, Science and Economic Development Canada (ISED) approvals. As of February 9, 2017, BCE had not received the requisite approvals from the Competition Bureau and ISED.

Wireline

Canada’s four major cable-TV companies had an estimated installed base of approximately 4.0 million telephony subscribers at the end of 2016. This represents a national consumer market share of approximately 40%, up from 39% in 2015. Other non-facilities-based competitors also offer local and long distance voice over IP (VoIP) services and resell high-speed Internet solutions. This competition, along with technological substitution to wireless services, continues to erode the number of residential network access lines and associated local and long distance revenues, as expected.

The four major cable-TV companies had an estimated 6.5 million Internet subscribers at the end of 2016, up from 6.3 million at the end of 2015. Telecommunications companies had approximately 6.3 million Internet subscribers, up from 6.1 million at the end of 2015. Although the consumer high-speed Internet market is maturing, with a penetration rate of approximately 83% in Western Canada and 82% across Canada, subscriber growth is expected to continue over

the next several years. We continue to make moderate market share gains due to the expansion of our fibre-optic network, as well as the pull-through of subscribers from our IP-based Optik TV service.

In 2016, Canadian IP TV providers increased their subscriber base by an estimated 10% to 2.5 million through expanded network coverage, enhanced differentiated service offerings, and marketing and promotions focused on IP TV. This growth was reflected in cable-TV and satellite-TV subscriber losses, and was primarily driven by strong subscriber loading at TELUS and Bell. We estimate that the four major cable-TV companies have approximately 6.0 million TV subscribers or a 52% market share, down one percentage point from 2015. The balance of industry subscribers were represented by satellite-TV and regional providers. In 2016, our primary Western Canadian cable-TV competitor, Shaw Communications, continued to focus on the roll-out of its metropolitan Wi-Fi network, and commenced trials of its new Comcast X1-based TV platform, which it began rolling out in Calgary. Through the acquisition of Wind Mobile, it is expected that Shaw will expand its ability to bundle wireless services with its cable-based services. In December 2016, Rogers announced its intention to adopt the Comcast X1 TV platform, and halted development of its own proprietary IP TV platform.

9.2 Telecommunications industry general outlook and trends

Wireless

Data growth continues to be driven by the ongoing adoption of data-centric smartphones, the effects of higher-rate two-year plans, the replacement of wireline access to services by wireless access and the ongoing deployment of tablet devices, as well as growth in machine-to-machine (M2M) devices and the Internet of Things (IoT). This trend is expected to continue to increase the demand for data services for the foreseeable future.

While LTE and LTE advanced technology increase download speeds and improve the customer experience, continually increasing data traffic demands is posing challenges to wireless carriers’ networks, including our own. (See *High demand for data* in *Section 10.3 Technology*.)

M2M and IoT technologies connect communications-enabled remote devices via wireless networks, allowing them to exchange key information and processes. Advanced platforms and networks are already in place in industries such as utilities, agriculture and fleet management, with deployment ongoing in other industries such as vehicle insurance, retail, food services and healthcare.

Increases in M2M volumes are anticipated to represent a meaningful opportunity for growth in the wireless market. While M2M applications generally have lower ARPU, they tend to generate high service volumes with low or no subsidy costs. The IoT also represents a meaningful opportunity for growth in mobility products and services. This opportunity comprises both wireless connectivity and productivity applications. While IoT connections generally have lower ARPU, these connections, when combined with applications, offer greater customer value and can generate commensurate margins.

Wireline

The traditional wireline telecommunications market is expected to remain very competitive in 2017 as technology substitution – such as the broad deployment of high-speed Internet; the use of email, messaging and social media as alternatives to voice services; and the growth of wireless and VoIP services – continues to replace higher-margin legacy voice revenues. Although we are a key provider of these substitution services, the decline in this legacy business continues as anticipated. Our long-standing growth strategy remains focused on wireless, data and IP-centric wireline capabilities.

The popularity of viewing TV and on-demand content anywhere, particularly on handheld devices, is expected to continue to grow as customers adopt services that enable them to view content on multiple screens. Streaming media providers continue to enhance over-the-top (OTT) streaming services in order to compete for a share of viewership. Studies suggest that 50% of English-speaking Canadian households had a subscription to Netflix at the end of 2016. Bell Media offers a competing content streaming service through Crave TV. We continue to enhance our Optik TV service with additional content, including ultra-high-definition 4K content, as well as distribution deals with OTT content providers Netflix and Crave TV. In the latter part of 2016, Shaw and Rogers wound down their OTT joint venture Shomi while Amazon Prime video streaming service launched in Canada.

TV providers with media service offerings are monitoring OTT developments and evolving their content and market strategy to compete with these non-traditional offerings, as OTT can be viewed as both competitive and complementary. We view OTT as an opportunity to add increased capabilities to our linear and on-demand assets, provide customers with flexible options to choose the content they want and encourage greater customer use of the TELUS high-speed Internet and wireless networks.

Telecommunications companies continue to make investments in DSL broadband and fibre-optic technologies in order to maintain and enhance their ability to support enhanced IP-based services and to support higher broadband

speeds. Cable-TV companies continue to evolve their cable networks with the gradual roll-out of the DOCSIS 3.1 platform. Although this platform increases speed in the near term and is more cost efficient, it does not offer the same advanced capabilities as fibre over the longer term. Our Optik TV footprint covers more than 2.9 million households and businesses, with more than 90% having access to speeds of at least 50 Mbps through VDSL bonding and other newer technologies, enabling us to deliver a better customer experience and more simultaneous content. In addition, at the end of 2016, our fibre-optic network was available to approximately 1.08 million homes and businesses. Advances in LTE wireless technology and our extensive LTE network also increasingly allow us to target otherwise underserved areas with a fixed wireless solution.

Combining wireline local and long distance voice services with wireless and high-speed Internet access and entertainment services, telecommunications companies are increasingly offering bundled products to achieve competitive differentiation and provide customers with more flexibility and choice on networks that can reliably support these services. Our broadband investments, including the build-out of our fibre-optic network, our premium differentiated IP-based Optik TV service and integrated bundled service offerings, continue to improve our competitive position and customer loyalty relative to our main cable-TV competitor.

The Canadian broadcasting industry is characterized by significant vertical integration, with most of our competitors owning or controlling broadcast content. In April 2016, Shaw Communications sold its wholly owned broadcasting subsidiary, Shaw Media, to Corus Entertainment Inc. for a combination of cash and shares that resulted in Shaw holding a 37% stake in Corus. (See *Section 9.4* and *Vertical integration into broadcast content ownership by competitors in Section 10.2.*)

Additional wireline capabilities

In the business market (enterprise and small and medium-sized businesses, or SMB), the convergence of IT and telecommunications, facilitated by the ubiquity of IP, continues to shape competitive investments. Cable-TV companies are making significant investments to better compete in the highly contested SMB space. Telecommunications companies like TELUS are providing network-centric managed applications, while IT service providers are bundling network connectivity with their proprietary software as service offerings. Manufacturers continue to bring all-IP and converged (IP plus legacy) equipment to market, enabling ongoing migration to IP-based solutions. The development of IP-based platforms providing combined IP voice, data and video solutions creates potential cost efficiencies that compensate, in part, for the loss of margins resulting from the migration from legacy to IP-based services. New opportunities exist for integrated solutions and business process outsourcing that could have a greater business impact than traditional telecommunications services. Data security is an area that represents both challenges and opportunities for us in providing customers with our robust data security solutions. Increasingly, businesses are looking to partner with their communications service provider to address their business goals and challenges, and to tailor solutions for their needs that leverage telecommunications in ways not imagined five to 10 years ago.

Healthcare is expected to be a growth area in future years, based on an aging population in Canada, an increasing emphasis on chronic disease management, and the potential benefits that technology can deliver in terms of efficiency and effectiveness within the sector. We utilize our expanding broadband network in order to increase the availability, integration and effectiveness of our innovative tools and applications across the primary care ecosystem in order to position ourselves to compete for the anticipated future growth in this sector. These tools include personal health records to facilitate self-management of healthcare data, electronic drug prescriptions with online insurance validation by the physician, and home health monitoring devices and data capture with caregiver oversight. The digitization of everyday functions in the healthcare ecosystem, combined with broadband network connectivity, provides an open platform that can support the development and delivery of even more advanced health applications. There are significant competitors in the sector, as described under *Wireline products and services in Section 4.1.*

Strong continued growth is expected in cloud-based services in Canada. Leveraging our eight intelligent data centres (IDCs) located across Canada, we are expanding cloud-computing services with managed solutions in higher-margin segments. This provides significant differentiation relative to our peers that have largely chosen to acquire companies in the pure-play data hosting space. Investments in our IDCs also provide internal capabilities to strategically enhance our own network and IT systems.

As technology in our industry continues to change rapidly and customer demand continues to grow, we are committed to evolving our business to offer innovative and reliable services and thought leadership in core future growth areas that are complementary to our traditional business. This – along with our intense focus on leadership in delivering an enhanced customer experience – positions us for continued differentiation and moderate growth.

9.3 TELUS assumptions for 2017

In 2017, we expect moderate growth in both wireless and wireline EBITDA, driven by the continued high demand for data services and high-speed Internet access in our wireless and wireline products and services; our consistent strategic

focus on our core wireless and wireline capabilities (see *Section 2.2 Strategic imperatives* and *Section 4 Capabilities*); significant ongoing investments in our leading broadband networks; continued efforts to enhance operational efficiency; and our intense focus on an enhanced customer experience across all areas of our operations.

Our assumptions in support of our 2017 outlook are generally based on the industry analysis above, including our estimates regarding economic and telecom industry growth (see *Section 1.2 The environment in which we operate*), as well as our 2016 results and trends discussed in *Section 5*. Our key assumptions include the following:

- Moderately higher economic growth in Canada in 2017, estimated to be 1.8% (from 1.2% in 2016). For our incumbent local exchange carrier (ILEC) provinces in Western Canada, we estimate that economic growth in B.C. will be 2.3% in 2017 (2.9% in 2016), and that economic growth in Alberta will be between 1.0 to 2.0% in 2017 (economic contraction of 2.4% in 2016).
- No material adverse regulatory rulings or government actions.
- Continued intense wireless and wireline competition in both consumer and business markets.
- A modest increase in wireless industry penetration of the Canadian market, consistent with 2016.
- Ongoing subscriber adoption of, and upgrades to, data-intensive smartphones, as customers want more mobile connectivity to the Internet.
- Wireless revenue growth resulting from modest growth in both postpaid subscriber loadings and blended ARPU.
- Continuing pressure on wireless acquisition and retention expenses, dependent on gross loading, competitive intensity and customer preferences.
- Continued growth in wireline data revenue, resulting from an increase in the high-speed Internet and Optik TV subscriber base, speed upgrades and expansion of the broadband infrastructure, as well as business outsourcing and healthcare solutions.
- Continued erosion of wireline voice revenue, resulting from technological substitution and greater use of inclusive long distance and lower wholesale volumes.
- Continued focus on our customers first initiatives and maintaining our customers’ likelihood-to-recommend scores.
- Employee defined benefit pension plans: Pension plan expense of approximately \$83 million recorded in Employee benefits expense and approximately \$5 million recorded in employee defined benefit pension plans net interest in Financing costs; a 3.80% rate for discounting the obligation and 4.00% rate for current service costs for employee defined benefit pension plan accounting purposes; and defined benefit pension plan funding of approximately \$65 million.
- Restructuring and other costs of approximately \$125 million for continuing operational efficiency and effectiveness initiatives, with margin enhancement initiatives to mitigate pressures related to economic growth, technological substitution and subscriber growth.
- Income taxes: Income taxes computed at applicable statutory rate of 26.4 to 26.9% and cash income tax payments between \$300 million and \$360 million (2016 – \$600 million). Cash tax payments are decreasing in 2017, reflecting both lower instalment payments for 2017 based on 2016 income and a lower final instalment payment for 2016 to be made in early 2017, partly offset by a decrease in income tax recoveries.
- Increased investments in broadband infrastructure, including upgrades and expansions of our fibre-optic network and 4G LTE capacity, as well as investments in network and systems resiliency and reliability.
- No wireless spectrum auctions anticipated in 2017.
- A continuing weakness in the average Canadian dollar to U.S. dollar exchange rate (U.S. 75.5 cents in 2016).

9.4 Telecommunications industry regulatory developments and proceedings

Our telecommunications, broadcasting and radiocommunication services are regulated under federal laws by various authorities, including the Canadian Radio-television and Telecommunications Commission (CRTC), Innovation, Science and Economic Development Canada (ISED) and the Minister of Canadian Heritage.

The following is a summary of certain significant regulatory developments and proceedings relevant to our business and our industry. This summary is not intended to be a comprehensive legal analysis and description of all of the specific issues described. Although we have indicated where we do not currently expect the outcome of a development or proceeding to be material to us, there can be no assurance that the expected outcome will occur or that our current assessment of its likely impact on us will be accurate. See *Section 10.4 Regulatory matters*.

Radiocommunication licences and spectrum-related matters

ISED regulates, among other matters, the allocation and use of radio spectrum in Canada and licenses radio apparatus, frequency bands and/or radio channels within various frequency bands to service providers and private users. The department also establishes the terms and conditions attaching to such radio authorizations, including restrictions on licence transfers, coverage obligations, research and development obligations, annual reporting, and obligations concerning mandated roaming and antenna site sharing with competitors.

600 MHz spectrum repurposing decision released

On August 14, 2015, ISED published *Decision on Repurposing the 600 MHz Band, SLPB-004-15*. In its decision, ISED announced its intention to jointly repack the 600 MHz band in line with the U.S. and to adopt the mobile band plan arising from the Federal Communications Commission (FCC) Incentive Auction that began on March 29, 2016. It is expected that ISED will consult on a licensing framework (including auction rules) in due course following the completion of the U.S. auction. An auction of 600 MHz spectrum in Canada is not expected until 2018 at the earliest. There is a risk that any auction rules may favour certain carriers.

Regulatory and federal government reviews

The CRTC and the federal government have initiated public proceedings to review various matters. They are discussed below.

Review of wireless code

On July 28, 2016, the CRTC launched a proceeding to review the Wireless Code that was originally implemented in 2013. The CRTC has asked parties to comment on the effectiveness of the Wireless Code and whether any of its provisions should be updated. The oral hearing portion of the proceeding commenced on February 6, 2017. TELUS is participating in this proceeding, asking for, among other things, changes to allow for more flexibility in how early cancellation fees are calculated, to allow for more offers to be made to customers, to clarify how caps on data usage are to be managed and to confirm that the default version of the permanent copy of a contract is to be electronic. These amendments will increase customer choice and are consistent with customer preferences. If, as expected, the CRTC determines that certain refinements of the Wireless Code are necessary, the decision in this proceeding is not expected to have a material impact on TELUS. However, it is too early to determine whether broader changes will be introduced.

Examination of differential pricing practices related to Internet data plans

On May 18, 2016, the CRTC issued *Examination of differential pricing practices related to Internet data plans, Telecom Notice of Consultation CRTC 2016-192*, following a complaint concerning Videotron’s pricing practices when offering its unlimited music service to its mobile wireless customers. In general terms, differential pricing occurs when the same or a similar product or service is sold to customers at different prices. Differential pricing is a normal feature of competitive markets, including telecommunications markets. Examples of differential pricing practices include zero-rating (where an Internet service provider (ISP) exempts data traffic from a particular application or a set of applications from a monthly data plan, which is often sold to consumers at a fixed monthly price) and sponsored data (where companies sponsor the data usage for specific content, allowing an ISP’s customers to access this content with no impact on monthly data plan allowances). The CRTC’s stated objective in this proceeding is to develop an overall approach to differential pricing for Internet data plans, as opposed to adjudicating complaints on a case-by-case basis. At the public hearing that began in late October 2016, the CRTC engaged in extensive discussion with participating parties on the issue of data usage and caps on usage, also referred to as “data caps,” despite the fact that this matter was not outlined for consideration in the notice. TELUS’ position is that differential pricing, including zero-rating, is pro-competitive and pro-consumer; however, differential pricing by vertically integrated communications companies in respect of their affiliated broadcasting services is a concern due to the market power of these firms, and zero-rating or discounting data in respect of their own affiliated broadcasting services should be prohibited by the CRTC. The decision in this proceeding is not expected to have a material impact on TELUS.

CRTC decision to require pro-rated refunds

On May 5, 2016, the CRTC issued *Quebecor Media Inc. – Prohibition of 30-day cancellation policies – Application regarding pro-rated refunds for cancelled services, Telecom Decision CRTC 2016-171*, in which the CRTC, among other things, mandated that all service providers are to provide pro-rated refunds to customers who cancel telecommunications and broadcasting service contracts. This decision was unexpected, in that it was contradicted by guidance that TELUS and third parties had received from CRTC staff following a 2014 CRTC decision regarding prohibition of a notice period for cancellation of services and in light of past decisions on the Wireless Code and notice of cancellation policies that had not mandated pro-rated refunds. The decision impacts billing systems, with no transition period provided to implement the required changes. On July 4, 2016, TELUS filed an application with the CRTC seeking guidance and clarification that the decision does not apply with respect to wireless services with a subsidized device, usage-based services and local telephone service in non-forborne exchanges. TELUS also requested an extension of time to implement the decision. The CRTC has yet to issue a decision on this matter. Pending resolution of TELUS’ application, the potential impact of this decision is not expected to be material.

Wireline wholesale services review

On July 22, 2015, the CRTC released *Review of wholesale wireline services and associated policies, Telecom Regulatory Policy CRTC 2015-326*. This decision updates the CRTC’s framework for the provision of regulated wireline wholesale services and will remain in place for a minimum of five years. The decision substantially preserves the status quo established in the CRTC’s 2008 wireline wholesale services framework, with two key exceptions. First, the CRTC has ordered the introduction of a disaggregated wholesale high-speed Internet access service for ISP competitors. This will include access to FTTP facilities. This requirement is being phased in geographically beginning in the largest markets in Ontario and Quebec (i.e. in the serving territories of Bell Aliant, Bell Canada, Cogeco, Rogers and Videotron). The CRTC initiated a followup proceeding to determine the technical configurations, appropriate costs and wholesale cost-based rates in those regions. Second, the CRTC determined that the provision of access to unbundled local loops to competitors will no longer be mandated and will be phased out over a three-year transition period. Unbundled local loops are the copper lines connecting homes and businesses to the central offices in TELUS’ network. Competitors use these lines to provide voice services or low-speed Internet services to their retail customers.

The FTTP followup activities directed in *Telecom Policy CRTC 2015-326* remain ongoing. In *Follow-up to Telecom Regulatory Policy 2015-326 – Implementation of a disaggregated wholesale high-speed access service, including over fibre-to-the-premises access facilities, Telecom Decision CRTC 2016-379*, the CRTC rendered its decision on the first phase of the followup process for disaggregated FTTP wholesale services for Bell, Rogers, Videotron and Cogeco by ruling on the technical configurations for their respective services. In December 2016, Bell Canada filed an application to review and vary and stay certain determinations in that decision concerning the implementation of disaggregated wholesale high-speed access on which the CRTC has yet to issue a determination. Associated tariff and cost study reviews have now begun for Bell, Rogers, Videotron and Cogeco, which filed their proposed cost studies and tariffs in January 2017. For the second phase, which involves FTTP wholesale services for the rest of Canada (including TELUS’ serving territories), a proceeding on technical configurations is expected to commence later in 2017. The associated cost study and tariff review will follow. TELUS anticipates no material adverse impact in the short term from the CRTC’s decision. Given the phased implementation of the mandated provision of wholesale access to our FTTP networks, it is too early to determine the impact this decision will have on TELUS in the longer term. The determination that the provision of access to unbundled local loops to competitors will no longer be mandated and will be phased out over a three-year transition period is not expected to have a material impact on TELUS.

Wireless wholesale services review

On May 5, 2015, the CRTC issued its decision at the conclusion of its wireless wholesale services review. The main determination was that the CRTC will regulate the wholesale GSM-based domestic roaming rates that TELUS, Rogers and Bell charge other wireless carriers. Proposed final tariff rates were filed by TELUS, Rogers and Bell on November 23, 2015, based on the CRTC’s Phase II costing approach. The CRTC is in the process of reviewing these tariff filings, with the announcement of the final rates expected in the first half of 2017. Interim rates are currently in place. While TELUS does not currently expect that the decision will have a negative material impact, the impact will be assessed once the final wholesale roaming rates have been approved.

Basic telecommunications services

On April 9, 2015, the CRTC issued *Telecom Notice of Consultation CRTC 2015-134*, announcing a two-phase proceeding to determine which telecommunications services (e.g. voice and broadband) are required by all Canadians in order to participate in the digital economy. In the first phase of the review, the CRTC gathered information in order to better understand which telecommunications services are being offered across Canada and whether any areas are underserved or unserved. In the second phase of the review, the CRTC conducted consultations to collect comments from Canadians regarding the issues identified. Following the second phase, a public hearing commenced in April 2016. Among other things, the CRTC reviewed whether broadband Internet service should be a basic telecommunications service and whether there should be changes to the National Contribution Fund from which subsidies are provided for voice service in high-cost serving areas (and video relay service). While TELUS is supportive of the inclusion of broadband service as a part of basic telecommunications services at a 5 Mbps download and 1 Mbps upload speed, TELUS opposed any new regulatory requirements pertaining to the provision of such service or mandating new minimum data allowances and quality of service indicators for retail broadband service, as well as any new subsidies for basic broadband service from the National Contribution Fund.

On December 21, 2016, the CRTC issued *Modern Telecommunications Services – The path forward for Canada’s digital economy*. The CRTC established a new “universal service objective” that Canadians, in urban areas as well as in rural and remote areas, have access to voice services and broadband Internet access services, on both fixed and mobile wireless networks. High-speed Internet service is now considered a basic telecommunications service, along with voice services and video-relay service. The CRTC established an objective for broadband service delivered at speeds of 50/10 Mbps for 90% of Canadian households by 2021 and 100% of households within 10 to 15 years. The CRTC expects this to be met by a combination of private investment and government funding. The CRTC did not impose an obligation to serve for high-speed Internet access on any of the ISPs.

The CRTC will establish a new broadband funding mechanism to complement private and government funding initiatives that will be administered by a neutral third party. Initial annual funding of \$100 million will be increased by \$25 million per year for four years and will then be capped at \$200 million per year. The existing local voice subsidy will be gradually phased out, but will not be removed unless reliable broadband Internet access service is available. TELUS retains the obligation to serve for local voice service in all exchanges.

As followup to the decision, ISPs will be required to offer the option for unlimited data for fixed broadband services, but no pricing restrictions were imposed. Followup proceedings will be launched in early 2017 to determine the precise details associated with transitioning the existing subsidy fund for voice service to the subsidization of broadband. The CRTC also outlined a number of other follow-up activities pertaining to contract information for fixed broadband services, the availability and accessibility of wireless services for customers with disabilities, and establishing quality of service metrics for broadband latency, jitter and packet loss for fixed broadband Internet service. It is not expected that this decision, including related followup activities, will have a negative material impact on TELUS.

9-1-1 networks

On March 29, 2016, the CRTC issued *Establishment of a regulatory framework for next generation 9-1-1 in Canada, Telecom Notice of Consultation CRTC 2016-116*. The CRTC announced this proceeding to establish a regulatory framework for next generation 9-1-1 services that will take into account the evolving public safety needs of Canadians, in that next generation 9-1-1 services will provide access to new and innovative 9-1-1 capabilities. TELUS participated in an oral hearing phase of the proceeding in mid-January 2017 and filed its final comments on January 31, 2017. It is not expected that the CRTC’s review will have a material impact on TELUS’ operations.

Review of tariffs for aggregated wholesale high-speed access services

The CRTC is conducting a review of cost studies and rates associated with aggregated wholesale high-speed access services, which are services provided by incumbent local exchange carriers (ILECs) and cable companies on their respective DSL and cable facilities to ISPs, which then resell high-speed Internet services. In March 2016, the CRTC determined that all rates for aggregated wholesale high-speed access services are to be interim rates and asked ILECs and cable companies to file cost studies and proposed rates for these services. While this review remains ongoing, on October 6, 2016, the CRTC issued *Tariff notice applications concerning aggregated wholesale high-speed access services – Revised interim rates, Telecom Order 2016-396*, in which it reduced many of the interim rates to be charged by ILECs and cable companies, including TELUS. The CRTC ordered the reduction for TELUS because it found that TELUS had filed insufficient evidence to support its cost studies. This review remains ongoing, and TELUS will have an opportunity to file further evidence to substantiate its costs and proposed rates. It is not expected that the outcome of this review will have a material impact on TELUS.

Disconnection practices between telecommunications service providers

On August 18, 2016, the CRTC issued *Call for comments: Disconnection practices between telecommunications service providers, Telecom Notice of Consultation CRTC 2016-333*, in which it sought industry comments with respect to the practices associated with the disconnection of the service for a customer of one telecommunications service provider by another telecommunications service provider when that customer changes carriers, and specifically whether any regulatory measures should be introduced, including mandatory notification requirements. TELUS filed its comments in this proceeding, for which a determination has yet to be issued. A decision is expected by the end of the first quarter of 2017 and is not expected to have a material adverse impact on TELUS.

Unwanted, unsolicited and illegitimate telecommunications

On November 7, 2016, the CRTC released *Empowering Canadians to protect themselves from unwanted unsolicited and illegitimate telecommunications, Compliance and Enforcement and Telecom Regulatory Policy CRTC 2016-442*, in which the CRTC found that existing solutions were not sufficient to help Canadians combat nuisance calls, including calls that use caller ID spoofing in order to conceal their origin. The CRTC requested industry participants to develop best practices for universal blocking of blatantly illegitimate calls, and required telecommunications service providers to propose technical solutions for opt-in filtering services. TELUS is participating in the followup proceeding to consider these issues. It is not expected that the CRTC’s followup review will have a material impact on TELUS’ operations.

Broadcasting-related issues

Broadcasting distribution undertaking licences held by TELUS

TELUS’ national licence to operate a video-on-demand undertaking was granted an administrative renewal, which extends the licence term to August 31, 2017 (*Broadcasting Decision CRTC 2016-7* issued on January 2, 2016). This licence-term extension has enabled the CRTC to conduct a consultation on the standard conditions of licence of all video-on-demand licences, which resulted in *Broadcasting Regulatory Policy CRTC 2016-436* issued on November 2, 2016). A renewal proceeding for all video-on-demand licences is expected to be launched in early 2017. Also, TELUS’ regional licences to operate broadcasting distribution undertakings in Alberta and British Columbia were granted an administrative renewal, which extends the licence terms to November 30, 2017. TELUS has filed applications for new

broadcasting distribution licences to serve markets in B.C. and Alberta, and a public hearing is expected in mid-2017 to consider these applications. TELUS’ regional broadcasting distribution licence to serve Quebec expires in 2018. In July 2014, the CRTC approved our application for a licence to operate a national pay-per-view service (scheduled to expire on August 31, 2020).

Enforcement of vertical integration framework

In September 2011, the CRTC announced a policy framework to address concerns relating to the potential incentive for anti-competitive behaviour by companies that own both programming services and distribution networks (vertically integrated broadcasting companies). The CRTC subsequently introduced a new code of conduct through amendments to the various broadcasting regulations and exemption orders. Following the CRTC’s “Let’s Talk TV” proceeding in 2014, the CRTC further expanded its ability to deal with anti-competitive conduct by replacing the code of conduct with a new Wholesale Code that will be made enforceable by regulation. This new Wholesale Code includes many new provisions to address abusive practices by vertically integrated broadcasting companies regarding the carriage of their programming services. In particular, the new Wholesale Code sets out a list of prohibited conduct and criteria to determine the fair market value of programming services in order to ensure that vertically integrated entities are prevented from artificially inflating the cost of services for their competitors. Bell Canada was granted leave to appeal the CRTC’s decision relating to the new Wholesale Code and the appeal is pending a hearing at the Federal Court of Appeal in the first quarter of 2017.

Without timely and strict enforcement of the vertical integration safeguards, there is a risk that vertically integrated competitors could unfairly raise programming costs for non-vertically integrated companies such as TELUS, and/or attempt to withhold content on digital media platforms, such as Internet and mobile platforms, or otherwise disadvantage us in our ability to attract and retain wireless or Optik TV customers. See *Vertical integration into broadcast content ownership by competitors* in Section 10.2.

Review of Canada’s cultural policies

On April 22, 2016, the Minister of Canadian Heritage announced a broad review of Canada’s cultural policies that is intended to strengthen the “creation, discovery and export of Canadian content in a digital world.” Amendments to the *Broadcasting Act*, *Telecommunications Act* and *Copyright Act*, changes to the mandates of institutions and agencies such as the CRTC and the CBC, and the potential introduction of new laws and establishment of new agencies are under consideration by the Minister. TELUS has participated in the two phases of this consultation. It is unknown at this time whether there will be a material impact on TELUS’ operations resulting from this consultation.

Government of Quebec Bill 74 – Blocking of certain websites associated with online gambling

Bill 74 was adopted on May 17, 2016, and assented to on May 18, 2016, by the National Assembly of Quebec. The provisions of this legislation, which will allow the Government of Quebec to require ISPs and wireless service providers operating in Quebec to block access to a list of prescribed gambling websites, are not yet in force (anticipated to occur in 2018). On July 8, 2016, the Public Interest Advocacy Centre (PIAC) filed an application with the CRTC seeking: a declaration that Bill 74 is unconstitutional; a declaration that any application by a carrier, to the CRTC, for website blocking pursuant to this legislation will be denied; and an interim injunction enjoining ISPs and wireless service providers operating in Quebec from actually blocking websites or taking steps to prepare for the implementation of Bill 74. In July 2016, the Canadian Wireless Telecommunications Association (CWTA) filed a constitutional challenge to Bill 74 in Quebec Superior Court. On September 1, 2016, the CRTC issued a letter asking for comments on its preliminary view that the PIAC application should be suspended pending the disposition of the constitutional challenge before the Quebec Superior Court. On September 16, 2016, TELUS filed a letter in support of the position that the PIAC application before the CRTC should be suspended. On December 9, 2016, the CRTC issued a decision suspending the PIAC application pending the disposition of the CWTA court challenge. The CRTC also confirmed its preliminary view that Section 36 of the *Telecommunications Act* prohibits carriers from blocking specific websites, and that compliance with other legal requirements would not justify blocking access without CRTC approval. The constitutional challenge to Bill 74 is expected to be heard in the Quebec Superior Court some time in the spring of 2017. It is not expected that this legislation will have a material impact on TELUS if and when it comes into force.

10. Risks and risk management

10.1 Overview

In the normal course of our business activities, we are exposed to both risks and opportunities. Risk oversight and risk management processes are integral elements of our risk governance and strategic planning efforts.

Board risk governance and oversight

We maintain strong risk governance and oversight practices, with risk oversight responsibilities outlined in the Board’s and the Board committees’ terms of reference. The Board is responsible for ensuring the identification of material risks to

our business and overseeing the implementation of appropriate systems and processes to identify, monitor and manage material risks.

In addition:

- Risks on the enterprise key risk profile are assigned for Board or committee oversight
- Board committees provide updates to our Board on risks overseen by those committees based on their respective terms of reference
- Our Board or Board committees may request risk briefings by our executive risk owners. The Vice-President, Risk Management and Chief Internal Auditor attends and/or receives a summary of these briefings.

Risk governance culture

We have a strong risk governance culture across TELUS that starts with clear risk management leadership and transparent communications, supported by the organization’s tone at the top. Accountability for the management of risks and reporting of risk information is clearly defined through our approach to risk governance. Training and awareness programs, appropriate resources and risk champions help to ensure we have all of the risk management competencies necessary to support effective decision-making across the organization. Ethics are integral to TELUS’ risk governance culture and our code of ethics and conduct directs team members to meet the highest standards of integrity in business decisions and actions.

Responsibilities for risk management

We use a multi-step approach to manage our risks, with responsibility shared across the organization. The first line of defence is executive and operating management, whose members have integrated risk management into core decision-making processes (including strategic planning processes) and day-to-day operations. We have risk management and compliance functions across the organization, including Finance, Legal, Privacy, Security and Business Continuity offices, which form the second line of defence. These functions work collaboratively with management to monitor the design and operation of our risk controls. Internal Audit is the third line of defence and provides independent assurance regarding the effectiveness and efficiency of risk management and controls across all aspects of the business.

Definition of business risk

We define business risk as the degree of exposure associated with the achievement of key strategic, financial, organizational and process objectives in relation to the effectiveness and efficiency of operations, the reliability and integrity of financial reporting, compliance with laws, regulations, policies, procedures and contracts, and safeguarding of assets within an ethical organizational culture.

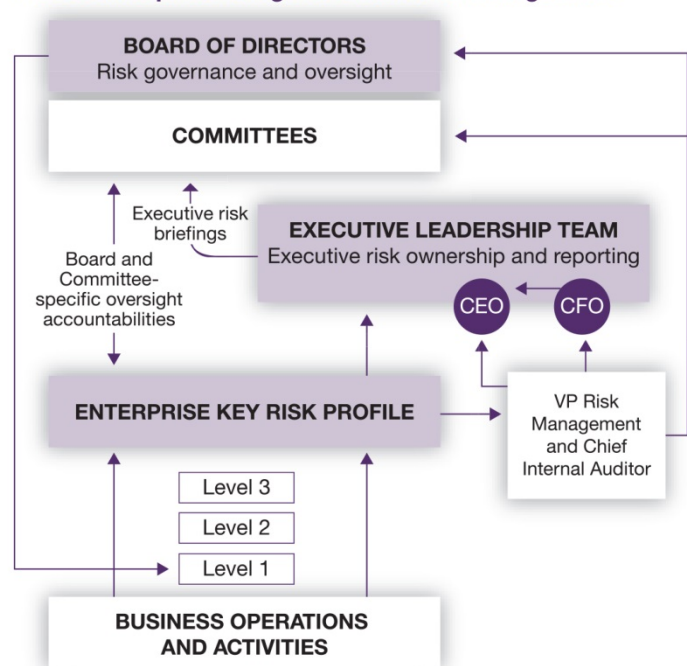
Our enterprise risks arise primarily from our business environment and are fundamentally linked to our strategies and business objectives. We strive to proactively mitigate our risk exposures through performance planning, business operational management and risk response strategies, which can include mitigating, transferring, retaining and/or avoiding risks. For example, residual exposure for certain risks is mitigated through insurance coverage, where we judge this to be efficient and commercially viable. We also mitigate risks through contract terms, as well as through contingency planning and other risk response strategies, as appropriate.

We strive to avoid taking on undue risk whenever possible and work to ensure alignment of risks with business strategies, objectives, values and risk tolerances.

Risk and control assessment process

We use a three-level enterprise risk and control assessment process that solicits and incorporates the input of team members from all areas of TELUS. The process enables us to track multi-year trends in the perception of various key risks and our control environment across the organization.

TELUS enterprise risk governance and management



Three-level enterprise risk and control assessment process

Level one: Annual risk and control assessment

Annually, we undertake a comprehensive review that brings together interviews with executive leaders, information and updates from our ongoing strategic planning process, consideration of recent internal and external audits, SOX (Sarbanes-Oxley Act of 2002) compliance and risk management activities, and an enterprise-wide risk and control environment assessment aligned with the 2013 COSO (Committee of Sponsoring Organizations of the Treadway Commission) enterprise risk management and internal control integrated frameworks.

The assessment is widely distributed to our entire leadership team (all executive vice-president, vice-president and director-level team members) and a random sample of management professional team members. More than 2,000 individuals participated in the assessment in 2016.

Key enterprise risks are identified, defined and prioritized. Perceived risk resiliency is assessed for each risk, risk appetite is evaluated by risk category and fraud risks are considered. Executive-level risk owners are assigned for each key risk and Board and committee risk oversight responsibilities are defined in our Board Policy and Terms of Reference.

Board members also complete an annual assessment in which they provide perspectives on our key risks and approach to enterprise risk management, and gauge our risk appetite by risk category.

Results of the annual risk and control assessment are shared with senior management, our Board of Directors and the Audit Committee. The results guide the development of our annual risk-focused internal audit program, which is approved by the Audit Committee. Risk assessments are also incorporated into our strategic planning, operational risk management and performance management processes, and are shared with our Board.

Level two: Quarterly risk assessment

We conduct quarterly risk assessment reviews with our executive-level risk owners and designated risk primes across all business units to capture and communicate changing business risks, identify key risk mitigation activities, and provide quarterly updates and assurance to the Audit Committee and other applicable Board committees.

Level three: Granular risk assessment

We conduct granular risk assessments for specific audit engagements and various risk management, strategic and operational initiatives (e.g. strategic planning, project and environmental management, safety, business continuity planning, network and IT vulnerability, and fraud and ethics). The results of the multiple risk assessments are evaluated, prioritized, updated and integrated into the key risk profile, policies and processes throughout the year.

Principal risks and uncertainties

The following subsections describe our principal risks and uncertainties and associated risk mitigation activities. The significance of these risks is such that they alone or in combination may have material impacts on our business operations, reputation, results and valuation.

Although we believe the measures taken to mitigate risks described in each risk section below are reasonable, there can be no expectation or assurance that they will effectively mitigate or fully address the risks described or that new developments and risks will not materially affect our operations or financial results. Forward-looking statements in this section and elsewhere in this MD&A are based on the assumption that our risk mitigation measures will be effective. See *Caution regarding forward-looking statements*.

10.2 Competition

Customer experience

Our customers’ loyalty and their likelihood to recommend TELUS are both dependent upon our ability to provide a service experience that meets or exceeds their expectations. Consequently, if our service experience does not meet or exceed customer expectations, TELUS’ brand could suffer, potentially resulting in higher rates of customer churn. Meanwhile, our profitability could be negatively impacted should customer net additions decrease and/or the costs to acquire and retain customers increase.

Risk mitigation: Our top corporate priority is putting customers first and earning our way to industry leadership in the likelihood to recommend from our clients. To enhance the customer experience, we continue to invest in our products and services, system and network reliability, team members and system and process improvements. Additionally, we endeavour to introduce innovative products and services, enhance our current services with integrated bundled offers and invest in customer-focused initiatives to bring greater transparency and simplicity to our customers, all in order to help differentiate our services from our competitors. (See *Strategic imperatives* in *Section 2.2* and *Corporate priorities* in *Section 3*.)

Intense wireless competition is expected to continue

At the end of 2016, there were nine facilities-based wireless competitors operating in Canada, including TELUS (some nationally and others regionally – see *Competition overview* in *Section 4.1*). Shaw Communications’ acquisition of Wind

Mobile in late 2015, subsequently rebranded as Freedom Mobile, will lead to increased competitive intensity in wireless and wireline services across major urban markets in B.C., Alberta and Ontario.

All wireless competitors use various promotional offers, including price discounting on both handsets and rate plans and flat-rate pricing for voice and data, to attract customers. Such promotional activity, as well as the sustained consumer appetite for higher-value smartphones, combined with the effect of the ongoing weakness in the Canadian dollar to U.S. dollar exchange rate, may continue to lead to higher costs of acquisition and retention. Meanwhile, more inclusive rate plans, including larger allotments of data for data sharing and international roaming, and substitution to increasingly available Wi-Fi networks could lead to pressure on data usage, resulting in pressure on average revenue per subscriber unit per month (ARPU) and churn. In addition, with a large percentage of the subscriber base already using devices with advanced features, customers may wish to upgrade less frequently, potentially requiring additional promotional incentives to encourage upgrades to a new device, which will add more pressure to costs of acquisition and retention. (See *Wireless trends and seasonality* in Section 5.4.)

We also expect increased competition based on the use of unlicensed spectrum to deliver higher-speed data services, such as the use of Wi-Fi networks to deliver entertainment to customers beyond the home. In addition, satellite operators such as Xplornet are augmenting their existing high-speed Internet access (HSIA) services by launching high-throughput satellites.

Risk mitigation: Our 4G wireless networks cover approximately 99% of Canada’s population, facilitated by network access agreements with Bell Canada and SaskTel. Wireless 4G technologies have enabled us to establish and maintain a strong position in smartphone and data device selection and expand roaming capability to more than 225 countries. Faster data download speeds provided by these technologies enable delivery of our Optik on the go service to mobile devices when customers are beyond the reach of Wi-Fi.

To compete more effectively in a variety of customer segments, we offer two flanker brands, Koodo Mobile and Public Mobile. We believe that by leveraging our TELUS, Koodo Mobile and Public Mobile brands through uniquely targeted value propositions and distinct distribution channels, including web-based channels, we are well-positioned to compete with other wireless providers.

We continue our disciplined long-term strategy of investing in the growth areas of our Company and executing upon our customers first priority. We intend to continue to market and distribute innovative and differentiated wireless services; offer bundled wireless services (e.g. voice, text and data), including data sharing plans; invest in our extensive network to support customer service; evolve technologies; invest in our distribution channels; and acquire the use of spectrum to facilitate service development and the expansion of our subscriber base, as well as to address the accelerating growth in demand for data usage.

Wireline voice and data competition

We expect competition to remain intense from traditional telephony, data, IP and IT service providers, as well as from VoIP-focused competitors in both consumer and business markets. This competitive intensity, including the use of various promotional offers, also places pressures on ARPU, churn and costs of acquisition and retention.

The industry transition from legacy voice infrastructure to IP telephony, and from legacy data platforms to Ethernet, IP virtual private networks, multi-protocol label switching IP platforms and IP-based service delivery models, continues to create both uncertainties and opportunities. Legacy data revenues and margins continue to decline, and this has been only partially offset by growth in demand and/or migration of customers to IP-based platforms. IP-based solutions are also subject to downward pricing pressure, lower margins and technological evolution.

Business

In the business wireline market, traditional facilities-based competitors continue to compete on the basis of network footprint and reliability, while over-the-top (OTT) providers emphasize price, flexibility and ease of use. Having made significant investments in voice over IP (VoIP), security and information technology (IT) services for business, cable-based competitors are using price discounting to drive new customer acquisition and retention. In addition, larger cloud service providers, such as Amazon and Microsoft, leverage global scale to deliver low-cost data storage and cloud computing services, but lack the depth and breadth of capabilities to deliver integrated solutions, as well as the local implementation and adoption support required for customers to realize the full values of their investments in managed IT and security services. Rapidly advancing technologies, such as software-defined networks and virtualized network functions, enable the layering of new services in cloud-centric solutions. Evolving customer needs represent both a growth opportunity and a risk to TELUS’ legacy voice and data revenue, as businesses seek to migrate fixed local line, long distance and/or voicemail services to the new cloud-centric market paradigm.

Consumer

In the consumer wireline market, cable-TV companies and other competitors continue to combine a mix of residential local VoIP, long distance, HSIA and, in some cases, wireless services under one bundled and/or discounted monthly

rate, along with their existing broadcast or satellite-based TV services. In 2016, Shaw Communications, our primary cable competitor in Alberta and B.C. launched new Internet and bundled promotional offers at deeply discounted prices and in early 2017 they started to roll out BlueSky TV, their next generation TV service, licensing an existing platform developed by Comcast, a U.S.-based cable company. In addition, Canadian cable competitors continue to increase the speed of their HSIA offerings and their roll-out of Wi-Fi services in metropolitan areas. To a lesser extent, other non-facilities-based competitors offer local and long distance VoIP services over the Internet and resell HSIA solutions. Technological innovation has resulted in a dramatic improvement in the performance and speed of satellite-based Internet access services and significantly enhanced their competitiveness. Xplornet recently launched a high-throughput low orbit 4G broadband satellite, allowing it to provide high speed Internet access services with speeds and performance comparable to or better than available wireline Internet access service. Erosion of our residential network access lines (NALs) is expected to continue due to this competition and ongoing technological substitution to wireless and VoIP. Legacy voice revenues are also expected to continue to decline. It is expected that competition in the consumer space will remain intense.

Risk mitigation: To improve our competitive position, we are making significant investments in our wireline broadband infrastructure, including connecting more homes and businesses directly to our gigabit-capable fibre-optic network. These investments meet customer demand for faster Internet service, including symmetrical download and upload speeds, expand the coverage of our high-speed Internet service and extend the coverage, capability and content lineup of our IP-based Optik TV service in B.C., Alberta and Eastern Quebec (see *Broadcasting* below). Additionally, our fibre-optic investments extend the reach and functionality of our business and healthcare solutions and will support a more efficient and timely evolution to a converged 5G network.

The provision of Optik TV service and service bundles helps us attract and pull through Internet subscriptions and mitigate residential NAL losses. TELUS Satellite TV service in Alberta and B.C., made possible through an agreement with Bell Canada, complements our expanding IP TV service footprint and enables us to serve households where our IP TV service is not currently available. We also continue to invest in other product development initiatives, including connected home capabilities and consumer health solutions. We also continue to enhance our Optik TV content capabilities through greater choice and flexibility by offering specific channel theme packs and on an individual basis, as well as embracing OTT solutions and facilitating those services directly through the set-top box and enabling ultra-high definition 4K content.

We continue to add to our capabilities in the business market through prudent product development initiatives, a combination of acquisitions and partnerships, a focus on key vertical markets (public sector, healthcare, financial services, energy and telecommunications wholesale) and expansion of solution sets in the enterprise market, as well as our modular approach in the SMB market (including services such as TELUS Business Connect) and Internet of Things (IoT) solutions. Through TELUS Health, we have leveraged our systems and proprietary solutions to extend our footprint in healthcare and benefit from the investments in eHealth being made by governments. Additionally, through our business process outsourcing services, we enable customer experience innovation to help our customers realize efficiencies and cost savings in their operations.

Technological substitution may adversely affect market share, volume and pricing

We face technological substitution across all key business lines and market segments, including the consumer, small and medium-sized business (SMB) and large enterprise markets.

Technological advances have blurred the boundaries between broadcasting, Internet and telecommunications. (See *Section 10.3 Technology*.) Wireless carriers and cable-TV companies continue to expand their offerings and launch next generation TV platforms, resulting in intensified competition for high-speed Internet services in residential and certain SMB markets, as well as for TV services and local access and long-distance. OTT services such as Netflix compete for share of viewership, which may accelerate the disconnection of TV services or affect subscriber and revenue growth in our TV and entertainment services. Wireless voice ARPU continues to decline as a result of, among other factors, substitution to messaging and OTT applications. We expect industry pressure from customer acquisition efforts and content distribution, costs and pricing to continue across most product and service categories and market segments.

Risk mitigation: Our IP TV and OTT multimedia initiatives provide the next generation of IP TV, but importantly tie our OTT environment to one platform, enabling TELUS to be agile in the delivery of OTT services. They also facilitate cloud-based media delivery and ultimately everything on demand, on any device, on any network. Active monitoring of competitive developments and internal prototyping in product and geographic markets enable us to respond rapidly to competitor offers and leverage our full suite of integrated wireless and wireline solutions and national reach, and we also monitor global telecom carriers for their next-generation OTT offers. To mitigate losses in legacy services in our incumbent areas of B.C., Alberta and Eastern Quebec, investments are being made in our broadband networks, including our fibre-optic network, in order to increase speeds, improve network reliability, expand our reach and provide an industry-leading customer experience. We also continue to enhance and introduce innovative products and services,

such as enabling ultra-high definition 4K content, integrated bundled offers across our services and invest in customer-focused initiatives to improve our customers’ experience. The adoption of new technologies and products is pursued to improve the efficiency of our service offerings.

Broadcasting

We offer Optik TV service to more than 2.9 million households and businesses in B.C., Alberta and Eastern Quebec, and we continue targeted roll-outs in new areas. TELUS TV provides numerous interactivity and customization advantages over cable-TV and we have achieved significant market share with more than 1.0 million TV subscribers at December 31, 2016. However, there can be no assurance that subscriber growth rates will be maintained, or that we will achieve planned revenue growth and greater operating efficiency, in the context of a high level of industry market penetration, a declining overall market for paid-TV services and actions by our competitors and content suppliers. In addition, competition from OTT services could also affect subscriber and revenue growth by accelerating the disconnection of TV services or reducing spending on those services.

Risk mitigation: We have broadened the addressable market for our Optik TV service through the deployment of advanced broadband technologies, including the continued expansion of our fibre-optic network to homes and businesses in communities across B.C., Alberta and Eastern Quebec. We continue to introduce new features and capabilities to our TV services, including third-party OTT offerings, and to strengthen our leadership position in Western Canada in the number of high-definition linear channels, video-on-demand services and ultra-high definition 4K content.

Vertical integration into broadcast content ownership by competitors

We are not currently seeking to be a broadcast content owner, but some of our competitors own and continue to acquire broadcast content assets. Greater vertical integration could result in content being withheld from us or being made available to us at inflated prices or on unattractive terms.

Risk mitigation: Our strategy is to aggregate, integrate and make accessible content and applications for our customers’ enjoyment, on a timely basis across multiple devices. We do not believe it is necessary to own content in order to make it accessible to customers on an economically attractive basis, provided there is timely and strict enforcement of the CRTC’s regulatory vertical integration safeguards to prevent abusive practices by vertically integrated competitors.

We support a regime under the *Broadcasting Act* that ensures all Canadian consumers continue to have equitable access to broadcast content irrespective of the distributor or platform they choose. We continue to advocate for the timely and strict enforcement of the CRTC vertical integration safeguards and for further meaningful safeguards, as required. We also actively intervene in broadcast licence renewals of vertically integrated competitors. (See *Examination of differential pricing practices and Enforcement of vertical integration framework in Section 9.4 Telecommunications industry regulatory developments and proceedings.*)

10.3 Technology

Technology is a key enabler of our business, however, its evolution brings risks and uncertainties, as well as opportunities. We maintain short-term and long-term strategies to optimize our selection and timely use of technology, while minimizing the associated costs, risks and uncertainties. Following are the main technology risks and uncertainties for TELUS and a description of how we proactively address them.

High demand for data challenges wireless networks and may be accompanied by increases in delivery cost

The demand for wireless data services continues to grow rapidly, driven by greater broadband penetration, growing personal connectivity and networking, increasing affordability and selection of smartphones and high-usage data devices, richer multimedia services and applications, IoT services (including machine-to-machine (M2M) data applications and other wearable technology), growth in cloud-based services and wireless price competition. Given the highly competitive wireless market in Canada, we expect that wireless data revenues will grow more slowly than demand for bandwidth. For example, according to the CRTC Communications Monitoring Report 2016, data traffic over mobile wireless networks increased by 44% in 2015, while the CRTC’s measure of retail wireless data revenue increased by only 16% in 2015. Rising data traffic levels and the fast pace of data device innovation present challenges to providing adequate capacity and maintaining high service levels.

Risk mitigation: Our ongoing investments in our 4G LTE network, including LTE advanced technology, as well as foundational investments in early 5G capabilities, allow us to manage data capacity demands by more effectively utilizing the spectrum we hold. We intend to implement further standards-based technologies that are ready for commercial deployment to these networks in order to provide higher-performance connectivity solutions. In addition, the evolution to LTE advanced technologies is supported by our investments in IP networks, IP/fibre backhaul to cell sites, including our small cells, and a software-upgradeable radio infrastructure. The LTE advanced expansion is expected to further increase network capacity and speed, reduce delivery costs per megabyte, enable richer multimedia applications and

services, and deliver a superior subscriber experience. LTE advanced technologies are currently deployed only in urban areas.

Mobile network infrastructure investment will increasingly be directed to systems based on network function virtualization (NFV) that offer greater capacity for computing and storage, higher resiliency, and more flexible software design. Our large-scale move to national, geographically distributed data centres that use generalized commercial off-the-shelf computing and storage solutions enables the utilization of broad-scale NFV and software-defined network technologies, which will allow us to virtualize much of our infrastructure and will also facilitate a common control plane for coordination of our virtualized and non-virtualized network assets.

Rapid growth of wireless data volumes requires optimal and efficient utilization of our spectrum holdings, which have more than doubled through our 2014 and 2015 purchases of 700 MHz, AWS-3 and 2500 MHz spectrum licences and provide added capacity to mitigate risks from growing data traffic. We began deploying 700 MHz and 2500 MHz spectrum holdings and we plan to utilize other spectrum licences purchased in recent years in combination with unlicensed supplementary spectrum, as network and device ecosystems evolve. The spectrum licences previously used for our CDMA network are being repurposed for use with LTE technology. Our public Wi-Fi service integrates seamlessly with our 4G network and offloads data traffic from our wireless spectrum to increasingly available Wi-Fi hotspots. Our deployment of small cell technology further increases the efficient utilization of our spectrum holdings.

Roll-out and evolution of wireless broadband technologies and systems

As part of a natural 4G network progression, we are committed to LTE advanced, LTE and HSPA+ technology to support medium-term and long-term growth of mobile broadband services. Our business depends on the deployment of wireless technology. We began a staged decommissioning of our iDEN network in 2016, while continuing to support our Mike[®] private network customers and actively migrate their services to our HSPA and LTE networks in order to minimize retention risk. The repurposing of spectrum holdings must be managed appropriately to ensure optimal use of capital and resources. Overall, as wireless broadband technologies and systems evolve, there is the risk that our future capital expenditures may be higher as our ongoing technology investments could involve costs higher than those recorded historically.

Risk mitigation: Our practice is to continually optimize capital investments in order to ensure reasonable payback periods for generating positive cash flows from investments and flexibility in considering future technology evolutions. Some capital investments, such as wireless towers, leasehold improvements and power systems, are technology-neutral.

Our wireless networks evolve through software upgrades to support enhancements in systems based on the third generation partnership project (a project that unites seven telecommunications standard development organizations and provides their members with a stable environment to produce the reports and specifications that define “third generation partnership” technologies) and the Institute of Electrical and Electronics Engineers that improve performance, capacity and speed. We expect to be able to leverage the economies of scale and handset variety of the North American and global ecosystems.

Reciprocal network access agreements, principally with Bell Canada, have facilitated our deployment of wireless technologies and provided the means for us to better manage our capital expenditures. These agreements are expected to provide ongoing cost savings beyond the initial network build, as well as the flexibility to invest in service differentiation and support systems.

We maintain close co-operation with our network technology suppliers and operator partners in order to influence and benefit from developments in LTE advanced, LTE, HSPA+ and Wi-Fi technologies.

Disruptive technology

A paradigm shift with the consumer adoption of alternative technologies, such as video and voice OTT offerings (e.g. Netflix, FaceTime) and increasingly available Wi-Fi networks, has the potential to negatively affect TELUS revenue streams. For example, Wi-Fi networks are being used to deliver various entertainment services to customers beyond the home. OTT content providers are now competing for share of entertainment viewership. These factors, including increasing consumer demand for access to Wi-Fi outside of their home, and OTT services on demand, on any device, may drive increased churn rates for our wireless, TELUS TV and high-speed Internet services. (See *Intense wireless competition is expected to continue* in Section 10.2 *Competition and OTT services present challenges to network capacity and conventional business models* below.)

Risk mitigation: Since early 2014, we have worked with thousands of businesses and many major sports and entertainment venues to continue to expand our public Wi-Fi network. This public Wi-Fi service is part of our network strategy of deploying small cells that integrate seamlessly with our 4G wireless network, automatically shifting our smartphone customers to Wi-Fi and offloading data traffic from our wireless spectrum. Integrated public Wi-Fi infrastructure build activity naturally extends service and channel opportunities with small-medium enterprises and

improves customers’ likelihood-to-recommend. Integration of home Wi-Fi increases propensity for higher data usage on smartphones within and outside the home, while benefiting, in part, uptake of TELUS Internet service.

Supplier risks

Restructuring of vendors or discontinuance of products may affect our networks and services

We have relationships with a number of vendors, which are important in supporting network and service evolution plans and delivery of services to our customers. Vendors may experience business difficulties, restructure their operations, be consolidated with other suppliers, discontinue products or sell their operations or products to other vendors, which could affect the future development and support of products or services we use, and ultimately, the success of upgrades and evolution of technology that we offer our customers, such as TELUS TV. There can be no guarantee that the outcome of any particular vendor strategy will not affect the services that we provide to our customers, or that we will not incur additional costs to continue providing services. Certain customer needs and preferences may not be aligned with our vendor selection or product and service offering, which may result in limitations on growth or loss of existing business.

Supplier concentration and market power

The popularity of certain models of smartphones and tablets has resulted in a growing reliance on certain manufacturers, which may increase their market power and adversely affect our ability to purchase certain products at an affordable cost. In addition, owners of popular broadcasting content may raise their distribution charges and attempt to renegotiate broadcasting distribution agreements we have with them, which could adversely affect our entertainment service offerings and/or profitability. See also *Wireline* in Section 9.2, *Broadcasting-related issues* in Section 9.4 and *Vertical integration into broadcast content ownership by competitors* in Section 10.2.

Risk mitigation: We consider possible vendor strategies and/or restructuring outcomes when planning for our future growth, as well as the maintenance and support of existing equipment and services. We have reasonable contingency plans for different scenarios, including working with multiple vendors, maintaining ongoing strong vendor relations and working closely with other product users to influence vendors’ product development plans. In addition, we regularly monitor the risk profile of our key vendors and audit the applicable terms and conditions of our agreements.

In respect of supplier market power, we offer and promote alternative devices or programming content to provide greater choice for consumers and to help lessen our dependence on a few key suppliers.

Support systems will be increasingly critical to operational efficiency

We have a large number of interconnected operational and business support systems, and their complexity has been continually increasing, which can affect system stability and availability. The development and launch of a new service typically requires significant systems development and integration efforts. Effective management of all associated development and ongoing operational costs is a significant factor in maintaining a competitive position and profit margins. As next-generation services are introduced, they must work with next-generation systems, frameworks and IT infrastructures, while being compatible with legacy services and support systems. There can be no assurance that any of our proposed IT systems or process change initiatives will be implemented successfully, that they will be implemented in accordance with anticipated timelines, or that sufficiently skilled personnel will be available to complete such initiatives. If we fail to implement and maintain appropriate IT systems on a timely basis, fail to create and maintain an effective governance and operating framework to support the management of staff, or fail to understand and streamline our significant number of legacy systems and proactively meet constantly evolving business requirements, any such failure could have an adverse effect on our business and financial performance.

Risk mitigation: In line with industry best practice, our approach is to separate business support systems (BSS) from operational support systems (OSS) and underlying network technology. Our aim is to decouple the introduction of new network technologies from the services we sell to customers so that both can evolve independently. This allows us to optimize network investments while limiting the impact on customer services, and also facilitates the introduction of new services. In addition, due to the maturing nature of telecommunications vendor software, we adopt industry standard software for BSS/OSS functions and avoid custom development where possible. This enables us to leverage vendor knowledge and industry practices acquired through the implementation of those platforms at numerous global telecommunications companies. We have established a next-generation BSS/OSS framework to ensure that, as new services and technologies are developed, they are part of the next-generation framework that will ease the retirement of legacy systems in accordance with TeleManagement Forum’s next-generation operations systems and software program. We also continue to make significant investments in system resiliency and reliability in support of our ongoing customers first initiatives.

Evolving wired broadband access technology standards may outpace projected access infrastructure investment lifetimes

The technology standards for broadband access over copper loops to customer premises are evolving rapidly, enabling higher broadband access speeds. The evolution is fuelled by consumer demand for faster connectivity, the need to

address growing competitor capabilities and offerings, the increasing use of OTT applications and the delivery of IP TV, all of which require greater bandwidth. In general, the evolution to higher broadband access speeds is achieved by deploying fibre-optic cable further out from the central office, thus shortening the copper loop portion of the access network, and by using faster modem technologies on the shortened copper loop. However, new access technologies are evolving faster than the historical investment cycle for access infrastructure. The introduction of these new technologies and the pace of adoption could result in requirements for additional capital funding not currently planned, as well as shorter estimated useful lives for certain existing infrastructure, which would increase depreciation and amortization expenses.

Risk mitigation: To advance our broadband network, we are actively deploying fibre-to-the-premises (FTTP) technologies, including major roll-outs in the cities of Edmonton and Vancouver. FTTP technology supports significantly greater bandwidth, including symmetrical download and upload speeds. We also continue to invest in our fibre-to-the-neighbourhood (FTTN) technology in order to maintain our ability to support competitive services – most recently, the upgrade to VDSL2 and bonding technologies.

In addition, we actively monitor the development and carrier acceptance of competing proposed FTTx standards (such as FTTP and fibre-to-the-distribution point or FTTPd). One or more of these fibre-based solutions may be a more practical technology to deploy in brownfield neighbourhoods or multiple dwelling units than the current xDSL deployments on copper loops. We are exploring business models for financially viable deployment of fibre-based technologies in areas currently connected by copper.

The evolution of these access architectures and corresponding standards, enabled with quality of service standards and network traffic engineering, all support our strategy to deliver IP-based Internet, voice and video services over a common broadband access infrastructure.

IP-based telephony as a replacement for legacy analogue telephony is evolving and cost savings are uncertain

We continue to monitor the evolution of IP-based telephony technologies and service offerings, and we have developed a consumer solution for IP-based telephony through access to our broadband infrastructure. This solution is being deployed and is replacing legacy analogue telephone service in areas that are served by fibre-based facilities. The solution can be expanded to provide additional telephone services over the existing analogue service infrastructure and is designed to replace the current platform in use today. We are also in the process of deploying our next-generation IP telephony solution for business users, which is intended to replace existing business VoIP platforms, as well as addressing areas that are served through fibre access. We are deploying converged IP solutions in the consumer segment that deliver telephony, video and Internet access on the same broadband infrastructure. However, the exchange of information between service providers with different broadband infrastructures is still at an early stage.

Our long-term technology strategy is to move all services to IP to simplify our network, reduce costs, enable advanced solutions and converge wireless and wireline services. Pursuing this strategy fully would involve transitioning our standard telephone service offering to IP-based telephony and phasing out legacy analogue-based telephone service. We could support this strategy by discontinuing regular analogue telephone lines and using digital-only broadband access lines. However, digital-only broadband access may not be feasible or financially viable in many areas for some time, particularly in rural and remote areas. Accordingly, we expect to support both legacy and IP-based voice systems for some time and incur costs to maintain both systems. There is a risk that investments in IP-based voice systems may not be accompanied by a reduction in the costs of maintaining legacy voice systems. There is also the risk that IP-based access infrastructure and corresponding IP-based telephony platforms may not be in place in time to avoid the need for some reinvestment in traditional switching platforms to support the legacy public switched telephone network access base in certain areas, which could result in some investment in line adaptation in non-broadband central offices.

Risk mitigation: We continue to deploy residential IP-based voice technologies into fibre-based communities, and we work with vendors and the industry to assess the technical applicability and evolving cost profiles of proactively migrating legacy customers onto IP-based platforms while striving to meet CRTC commitments and customer expectations. Our ongoing investments in advanced broadband network technologies, including FTTP, should enable a smoother future evolution of IP-based telephony. We are also working with manufacturers to optimize the operations, cost structure and life expectancy of analogue systems and solutions so that some of this infrastructure can be adapted to a point where it will form part of the overall evolution towards IP. Additionally, IP-based solutions that we are currently deploying are capable of supporting a wide range of customers and services, which helps limit our exposure to any one market segment. Going forward, as our wireless services evolve, we will continue to assess the opportunity to further consolidate separate technologies into a single voice service environment. One example is the consolidation of our new IP-based consumer VoIP solution into the same platform that supports wireless telephony. We are looking at

opportunities to rationalize our existing legacy voice infrastructure in order to manage costs. We are also working with our vendors and partners to reduce the cost structure of VoIP deployments.

Convergence in a common IP-based application environment for telephony, Internet and video is complex

The convergence of wireless and wireline services in a common IP-based application environment, delivered over a common IP-based network, provides opportunities for cost savings and for the rapid development of more advanced services that are also more flexible and easier to use. However, the transformation from separate systems to a common environment is very complex and could be accompanied by implementation errors, design issues and system instability.

Risk mitigation: We mitigate implementation risk through modular architectures, lab investments, employee trials, partnering with system integrators where appropriate, using hardware that is common to most other North American IP-based technology deployments and introducing virtualization technologies, where feasible. We are also active in a number of standards bodies, such as the Metro Ethernet Forum and IP Sphere, in order to help influence a new IP infrastructure strategy that leverages standards-based functionality, which could further simplify our networks.

Delivery of fibre-based facilities leveraged by IP telephony solutions is expensive and complex, with long implementation schedules

The delivery of fibre-based facilities to new communities and regions requires significant investment and planning, as well as long implementation schedules. This may rule it out as a viable alternative in communities where the legacy voice equipment requires immediate replacement. It may not be cost-effective to deliver fibre-optic network access to customers who subscribe only to home phone services, which would prevent full migration away from legacy technologies.

Risk mitigation: We mitigate schedule risk by continuing to maintain our legacy switching environments and striving to maintain the necessary technological expertise, access to replacement hardware and regular maintenance programs. We support delivery of IP telephony through a copper-based access facility by deploying line access gateway technology that connects our customers’ generic equipment with the IP telephony platforms, which gives us a more cost-effective way to provide those customers with the reliability and enhanced capabilities of these solutions.

OTT services present challenges to network capacity and conventional business models

OTT services are a category of services being delivered over the Internet that compete directly with traditional pay-TV, video and wireless and wireline voice and messaging services. OTT video services, in particular, have rapidly become the largest source of traffic on the North American Internet backbone. OTT service providers do not invest in, or own, networks and growth in their services presents Internet service providers (ISPs) and network owners with the challenge of preventing network congestion. While we have designed an IP-based network that has not experienced significant congestion problems through 2016, there can be no assurance that we will not experience such congestion in the future.

Risk mitigation: As additional OTT providers launch services and offer higher-resolution video over the Internet, we continue to make investments in our network to support greater capacity. We are also developing new responses, such as more flexible data plans, to the challenges posed by the OTT providers. These investments include the ongoing build-out of our fibre-optic network, including multi-year investments to connect homes and businesses in Vancouver and Edmonton to our gigabit-capable network.

Capital expenditure levels and potential future outlays for spectrum licences may be impacted by our operating and financial results, as well as our ability to carry out financing activities

Our capital expenditure levels are affected by our broadband initiatives, including connecting more homes and businesses directly to fibre; our ongoing deployment of newer wireless technologies such as 5G; utilizing newly acquired spectrum; investments in network resiliency and reliability; increasing subscriber demand for data; evolving systems and business processes; implementing efficiency initiatives; supporting large complex deals; and participation in future wireless spectrum auctions held by Innovation, Science and Economic Development Canada (ISED). There can be no assurance that investments in capital assets and wireless spectrum licences will not be affected by future operating and financial results.

Risk mitigation: We carry out a number of unique initiatives each year that are aimed at improving our productivity and competitiveness. See *Reorganizations, integration of acquisitions and implementation of large enterprise deals in Section 10.6*. For a discussion of financing risks and risk mitigation activities, see *Section 10.7 Financing, debt requirements and returning cash to shareholders*.

10.4 Regulatory matters

The regulatory regime under which we operate, including the laws, regulations, and decisions in regulatory proceedings and court cases, reviews, appeals, policy announcements, and other developments such as those described in *Section 9.4 Telecommunications industry regulatory developments and proceedings*, imposes conditions on the products

and services that we provide and how we provide them. The regulatory regime sets forth, among other matters, rates, terms and conditions for the provision of telecommunications services, licensing of broadcast services, licensing of spectrum and radio apparatus, and restrictions on ownership and control by non-Canadians.

Changes to our regulatory regime

Changes to the regulatory regime under which we operate, including changes to laws and regulations, could materially and adversely affect our business, results of operations, operating procedures and profitability. Such changes may not be anticipated or, where they are anticipated, our assessment of their impact on us and our business may not be accurate. While we are involved or intervene in proceedings, court cases or inquiries related to the application of the regulatory regime, such as those described in *Section 9.4 Telecommunications industry regulatory developments and proceedings*, there is no certainty that our current prediction of the likely outcomes of such proceedings will be accurate or that the positions that we advocate in such proceedings will be adopted. Changes to our regulatory regime could increase our costs, restrict or impede the way we provide our services or manage our networks, or alter customer perceptions of our operations. The further regulation of broadband, wireless and our other activities and any related regulatory decisions could also restrict our ability to compete in the marketplace and limit the return we can expect to achieve on past and future investments in our networks.

Risk mitigation: TELUS attempts to mitigate regulatory risks through its participation in CRTC and federal government proceedings, including filing evidence in ongoing reviews and participating in technical committees established by the CRTC, as described in *Section 9.4 Telecommunications industry regulatory developments and proceedings*. See also *Vertical integration into broadcast content ownership by competitors* in *Section 10.2 Competition*.

Spectrum and compliance with licences

We require access to radio spectrum to carry on our wireless business. The allocation and use of spectrum in Canada are governed by spectrum licences issued by, and radio authorization conditions set by, ISED. While we believe that we are substantially in compliance with our radio authorization conditions, there can be no assurance that we will be found to comply with all radio authorization conditions, or if we are found not to be compliant, that a waiver will be granted or that the costs to be incurred to achieve compliance will not be significant. Any failure to comply with the radio authorization conditions could result in the revocation of our licences and/or the imposition of fines. Our ability to provide competitive services, including by improving our current services and offering new services on a timely basis, is also dependent on our ability to obtain access to new spectrum licences as they are made available. The revocation of, or a material limitation on, certain of our spectrum licences, or our failure to obtain access to new spectrum as it becomes available, could have a material adverse effect on our business, results of operations and financial condition by, among other things, negatively affecting the quality of our network and service offering and thereby impeding our ability to attract or retain customers.

Risk mitigation: We continue to strive to comply with all licence and renewal conditions and plan to participate in future wireless spectrum auctions. We have advocated to the federal government for a level playing field in respect of spectrum auction rules, such that long-standing wireless companies like TELUS can bid on an equal footing with others for spectrum blocks available at auction or are able to purchase spectrum licences available for sale from competitors. Advanced wireless services (AWS) entrants are now part of established, sophisticated and well-financed cable companies and we will strongly advocate that preferential treatment is not required.

Restrictions on foreign ownership

We are subject to the foreign ownership and control restrictions, including restrictions on the ownership of our Common Shares by non-Canadians, imposed by the *Canadian Telecommunications Common Carrier Ownership and Control Regulations* and the *Telecommunications Act* (collectively, the *Telecommunications Regulations*) and the *Broadcasting Act* and associated regulations. Although we believe that we are in compliance with the relevant legislation, there can be no assurance that a future CRTC or Canadian Heritage determination, or events beyond our control, will not result in us ceasing to be in compliance with the relevant legislation. If such a development were to occur, the ability of our subsidiaries to operate as Canadian carriers under the *Telecommunications Act* or to maintain, renew or secure licences under the *Radiocommunication Act* and the *Broadcasting Act* could be jeopardized and our business could be materially adversely affected.

Specifically, to maintain our eligibility to operate certain of our subsidiaries that are deemed to be Canadian carriers under these laws, among other requirements, the level of non-Canadian ownership of TELUS Common Shares cannot exceed 33⅓% and we must not otherwise be controlled by non-Canadians.

Risk mitigation: The *Telecommunications Regulations* give TELUS, which is a holding corporation of Canadian carriers, certain powers to monitor and control the level of non-Canadian ownership of our Common Shares. These powers have been incorporated into TELUS’ Articles and were extended to ensure compliance under both the *Broadcasting Act* and the *Radiocommunication Act* (under which the requirements for Canadian ownership and control were subsequently cross-referenced to the *Telecommunications Act*). These powers include the right to: (i) refuse to register a transfer of

Common Shares to a non-Canadian; (ii) require a non-Canadian to sell any Common Shares; and (iii) suspend the voting rights attached to the Common Shares held by non-Canadians in inverse order of registration. We have reasonable controls in place to monitor foreign ownership levels through a reservation and declaration system.

10.5 Human resources

Employee retention, recruitment and engagement

Our success depends on the abilities, experience and engagement of our team members. The loss of key employees through attrition and retirement – or any deterioration in overall employee morale and engagement resulting from organizational changes, unresolved collective agreements or ongoing cost reduction initiatives – could have an adverse impact on our growth, business and profitability and our efforts to enhance the customer experience.

The level of employee engagement at TELUS continues to place our organization within the top quartile of all employers surveyed.

Risk mitigation: We aim to attract and retain key employees through both monetary and non-monetary approaches, and we strive to protect and improve engagement levels. Our compensation and benefits program is designed to support our high-performance culture and is both market-driven and performance-based. We also have a succession planning process to identify and develop employees for key management positions.

Where required, we continue to implement targeted retention solutions for employees with talents that are scarce in the marketplace. As well, a benefits program is offered to team members that allows tailoring of personal health, wellness, lifestyle and retirement choices to suit individual and family needs.

We believe that our relatively strong employee engagement score continues to be influenced by our intense focus on the customer experience and our success in the marketplace. We plan to continue our focus on other non-monetary factors that are clearly aligned with engagement, including performance management, career opportunities, training and development, recognition and our work styles program (e.g. facilitating working remotely from home or other alternative work locations). See also *Section 10.10 Team member health, wellness and safety*.

10.6 Process risks

Systems and processes

We have numerous complex systems and process change initiatives underway. There can be no assurance that the full complement of our various systems and process change initiatives, including those required to improve delivery of customer services and support management decision-making, will be successfully implemented or that funding and sufficiently skilled resources will be available to complete all key initiatives planned. There is risk that certain projects may be deferred or cancelled and the expected benefits of such projects may be deferred or unrealized. Moreover, any ineffectiveness in the change management required to protect our complex systems and limit service disruptions could adversely impact our customer service, operating performance and financial results.

Risk mitigation: TELUS has change management policies, processes and controls in place, based upon industry best practices. In general, we strive to ensure that system development and process change are prioritized, and we apply a project management approach to such changes that includes reasonable risk identification and contingency planning, scope and change control, and resource and quality management. We also generally complete reasonable functional, performance and revenue assurance testing, as well as capturing and using any lessons learned. Where a change involves major system and process conversions, we often move our business continuity planning and emergency management operations centre to a heightened state of readiness in advance of the change.

Reorganizations, integration of acquisitions and implementation of large enterprise deals

We carry out a number of unique operational consolidation, cost reduction and rationalization initiatives each year that are aimed at improving our productivity and competitiveness. Examples of these initiatives are: our operating efficiency and effectiveness program to drive improvements in EBITDA, including the expected benefits of the immediately vesting transformative compensation initiative; business integrations; business process outsourcing; offshoring and reorganizations, including any full-time equivalent (FTE) employee reduction programs; procurement initiatives; and real estate rationalization. We may record significant cash and non-cash restructuring charges and other costs for such initiatives, which could adversely impact our operating results. There can be no assurance that all planned initiatives will be completed, or that such initiatives will provide the expected benefits or will not have a negative impact on our customer service, work processes, employee engagement, operating performance and financial results. Additional revenue and cost efficiency and effectiveness initiatives will continue to be assessed and implemented, as required.

Post-acquisition activities include the review and alignment of accounting policies, corporate policies such as ethics and privacy policies, employee transfers and moves, information systems integration, optimization of service offerings and establishment of control over new operations. Such activities may not be conducted efficiently and effectively, which

may negatively impact service levels, competitive position and financial results. There can be no assurance that we will be able to successfully and efficiently integrate acquisitions, complete divestitures or establish partnerships in a timely manner, and realize expected strategic benefits. In respect of the transaction with BCE Inc. to acquire a portion of Manitoba Telecom Services, Inc.’s (MTS’) postpaid wireless subscribers and dealers, as of February 9, 2017, BCE had not received the requisite approvals from the Competition Bureau and ISED.

Large enterprise deals may be characterized by the need to anticipate, understand and respond to complex and multi-faceted customer-specific enterprise requirements, including customized systems and reporting requirements, service credits that lower revenues, and significant upfront expenses and capital expenditures required to implement the contracts. There can be no assurance that service implementation will proceed as planned and expected efficiencies will be achieved, which may impact return on investment or projected margins. We may also be constrained by limits on available staff and system resources and the level of co-operation from other service providers, which may in turn limit the number of large contracts that can be implemented concurrently in a given period and/or increase our costs related to such implementations.

Risk mitigation: We focus on and manage organizational changes through a formalized business transformation function by leveraging the expertise, key learnings and effective practices developed during the implementation of large enterprise deals, as well as mergers, business integrations and efficiency-related reorganizations, in recent years.

We have a post-merger integration (PMI) team that applies an integration model, based on learnings from previous integrations, which enhances and accelerates the standardization of our business processes and is intended to preserve the unique qualities of each acquired operation.

We have also gained experience during the implementation of numerous large enterprise deals over a number of years, and we expect to continue to focus on successfully implementing recent large enterprise contract wins, as well as on developing more shared systems and processes. We expect to continue being selective as to which new large contracts we will bid on and we continue to focus our efforts on the SMB market. We have a sales and bid governance process in place, which involves preparation, review and signoff of bids, with all of the related due diligence and authorizations.

We follow standard industry practices for project management, including executive/senior level governance and project oversight, commitment of appropriate project resources, tools and supporting processes, and proactive project-specific risk assessments and risk mitigation planning. We also conduct independent project reviews and internal audits to monitor progress and identify areas that may require additional focus, and to identify any systemic issues and learnings in project implementations that could be shared among other future projects.

During the year ended December 31, 2016, no significant acquisitions were completed.

Data protection

We operate data centres and collect and manage data in our business and on behalf of our customers (including, in the case of TELUS Health, sensitive health information). Some of our efficiency initiatives rely on the offshoring of internal functions to our personnel in other countries or outsourcing to partners located in Canada and abroad. To be effective, these arrangements require us to allow personnel in other countries and domestic and foreign partners to have access to this data.

TELUS or its partners may be subject to software, equipment or other system malfunctions, or thefts or other unlawful acts that result in the unauthorized access to, or change, loss or destruction of, our data. There is a risk that such malfunctions or unlawful acts may compromise the privacy of individuals, including our customers, employees and suppliers. Despite our efforts to implement controls in domestic and offshore operations and at our partners’ operations, unauthorized access to data could lead to data being lost, compromised or used for inappropriate purposes that could, in turn, result in financial loss (loss of subscribers or damage to our ability to attract new ones), harm our brand and reputation, expose us to claims of damages by customers and employees, and impact our customers’ ability to maintain normal business operations and deliver critical services. Also see *Legal and ethical compliance* in *Section 10.9 Litigation and legal matters* and *Security* in *Section 10.11 Human-caused and natural threats*.

Risk mitigation: Certain new TELUS information technology systems undergo a security and privacy assessment early in their development life cycle, pursuant to which data that is to be used and/or collected is reviewed and classified, and design features such as audit, logging, encryption and access control restrictions are recommended, when applicable or possible. As part of TELUS’ systems and software development life cycle and quality assurance processes, privacy and security controls are also tested before new systems are fully deployed.

Our IDCs have security threat detection and mitigation capabilities, and certain data centres and networks undergo yearly external independent third-party audits. A core component of that audit and certification process is the assessment of TELUS’ logical, physical and policy-based security and privacy controls. Further, we have a vulnerability management

program in place that monitors both our Internet-facing and internal network and systems in order to track and mitigate vulnerabilities that may be detected.

To ensure the security of our customers’ credit card transactions, we use security technologies such as encryption and segmentation, and we adhere to the principle of least privilege. We maintain these practices and review their effectiveness on a regular basis, giving consideration to industry standards and changes in the constantly evolving threat landscape.

Another component of our strategy is the stipulation that data generally resides in our facilities in Canada, with the deployment of infrastructure that supports partner connectivity to view our systems. We require partners and service providers to comply with privacy and security measures, including the reporting of any possible data-related threats. Personnel in other countries are provided with remote views of authorized data only and, where applicable, without the data being stored on local systems. These personnel are also required to comply with physical and process restrictions and participate in training designed to help prevent and detect unauthorized access to, or use of, our data.

There can be no assurance that our controls will prove effective in all instances.

Foreign operations

Maintaining our international operations presents unique risks, including: competition in the business process outsourcing industry; ease with which customers can move their business if we fail to meet or exceed their expectations; infrastructure and security challenges; employee recruitment and retention; concentration of customers; country-specific risks (such as differences in political, legal and regulatory regimes and cultural values); different taxation regimes; differences in exposure to and frequency of natural disasters; and foreign currency exchange fluctuations. There can be no assurance that international initiatives and risk mitigation efforts will provide the benefits and efficiencies expected, or that there will not be significant difficulties in combining different management and cultures, which could have a negative impact on operating and financial results. See also *Legal and ethical compliance* in Section 10.9 *Litigation and legal matters* and *Natural Disasters and intentional threats to our infrastructure and business operations* in Section 10.11 *Human-caused and natural threats*, which may affect our international operations.

Risk mitigation: Our strategy is to differentiate ourselves by focusing on the continued development of our team, as well as our culture of giving where we live. We also invest in service development and process improvements, and we regularly survey customers for feedback and monitor quality of service metrics to ensure we proactively address our customers’ concerns and exceed their expectations. Our information technology systems undergo a security and privacy assessment early in their development life cycle, where privacy and security controls are tested before any new systems are deployed. We use security technologies and adhere to certain standards, reviewing their effectiveness regularly to remain abreast of changes in the threat landscape. We make significant investments in support of our team members, including high-end workplace facilities, competitive benefits, ongoing training and development and recurring surveys to resolve areas of concern. We maintain a diverse base of operations, with facilities located in the Philippines, Europe, Central America and the United States. This diversity provides us with an opportunity to minimize country-specific risks and the ability to serve customers in multiple languages and in multiple time zones. It also provides us with network redundancy and contingency planning opportunities and the ability to divert operations in emergency situations. We continue to work with our international operations to extend sound and effective operational practices, including the application of our privacy, ethics and anti-bribery policies, share best practices between international and domestic Canadian operations, as appropriate, and ensure that internal controls are implemented, tested, monitored and maintained. We also utilize foreign currency forward contracts, as well as hedge accounting on a limited basis, to mitigate currency risks (see *Currency risk* in Section 7.9 *Financial instruments, commitments and contingent liabilities*).

Real estate joint ventures (TELUS Garden and TELUS Sky)

Risks associated with our real estate joint ventures include possible construction-related cost overruns, financing risks, reputational risks and the uncertainty of future demand, especially during market downturns. There can be no assurance that the real estate joint ventures will be completed on budget or on time, or will obtain lease commitments as planned. Accordingly, we are exposed to the risk of loss on our investment and loan amounts, and a potential inability to service debt payments should a project’s business plan not be successfully realized. Additionally, reputational risks arise from the possibility that we may be unable to meet our stated commitments and/or that the quality of the development may not be consistent with TELUS brand expectations.

Risk mitigation: We have established joint ventures with partners experienced in large commercial and residential real estate projects to develop TELUS Garden (Westbank) in Vancouver and TELUS Sky (Westbank and Allied REIT) in Calgary. The TELUS Garden residential condominium project was substantially pre-sold prior to the commencement of construction, and the majority of residential condominium units were transferred to the purchasers by the end of 2016. At the same time, lease commitments for the TELUS Garden office project represented 99% of leasable space, while the retail space within the TELUS Garden residential project was 99% leased.

For projects in progress, budget-overrun risks have been mitigated with fixed-price supply contracts (89% of TELUS Sky has had tenders approved and contracts awarded), expert project management oversight and insurance for certain risks. Costs for TELUS Sky continue to be consistent with the approved budget plan and we are applying the knowledge and experience gained on the TELUS Garden project to streamline and improve the cost-effectiveness of TELUS Sky.

In response to the current economic conditions in Calgary, the TELUS Sky partnership has taken a number of steps to better position the development for success, including: moving to a single-phase occupancy to delay the start dates of any potential office leases from the first quarter of 2018 to the fourth quarter of 2018; revising revenue projections and adjusting tenant inducements to align with current market expectations; and evaluating various approaches to adjusting the mix between office and residential, as well as creating a wider range of residential offerings to address current market demand.

10.7 Financing, debt requirements and returning cash to shareholders

Our business plans and growth could be negatively affected if existing financing is not sufficient to cover funding requirements

Risk factors, such as disruptions in capital markets, regulatory requirements for an increase in bank capitalization, a reduction in lending activity in general, or a reduction in the number of Canadian chartered banks as a result of reduced activity or consolidation, could reduce the availability of capital or increase the cost of such capital for investment grade corporate issuers, such as TELUS. External capital market conditions could potentially affect our ability to make strategic investments and meet ongoing capital funding requirements.

Risk mitigation: We may finance future capital requirements with internally generated funds, borrowings under the unutilized portion of our bank credit facility, use of securitized trade receivables, use of commercial paper and/or the issuance of debt or equity securities. We have a shelf prospectus in effect until April 2018, under which we can offer up to \$2.2 billion of debt or equity securities as of the date of this MD&A. We believe that our investment grade credit ratings, coupled with our efforts to maintain a constructive relationship with banks, investors and credit rating agencies, continue to provide reasonable access to capital markets.

To enable us to meet our financial objective of generally maintaining \$1 billion of available liquidity, we have a \$2.25 billion credit facility that expires on May 31, 2021 (\$1.6 billion available at December 31, 2016), as well as availability under other bank credit facilities (see *Section 7.6 Credit facilities*). In addition, TELUS Communications Inc. (TCI) has an agreement with an arm’s-length securitization trust under which it is able to sell an interest in certain of its trade receivables up to a maximum of \$500 million, of which \$400 million was available at December 31, 2016 (see *Section 7.7 Sale of trade receivables*).

Ability to refinance maturing debt

At December 31, 2016, our long-term debt was \$13 billion, with maturities in certain years from 2017 to 2046 (see the *Long-term debt principal maturities* chart in *Section 4.3*). We operate a commercial paper program (maximum of \$1.4 billion) that currently permits access to low-cost funding. At December 31, 2016, we had \$613 million of commercial paper outstanding, all of which was denominated in U.S. dollars (U.S.\$465 million). When we issue commercial paper, it must be refinanced on an ongoing basis in order to realize the cost savings relative to borrowing on the \$2.25 billion credit facility. Capital market conditions may prohibit the roll-over of commercial paper at low rates.

Risk mitigation: We completed a number of debt transactions in 2015 and 2016 (see *Section 7.4*). As a result, the average term to maturity of our long-term debt (excluding commercial paper and the revolving component of the TELUS International credit facility) was 10.4 years at December 31, 2016 (11.1 years at December 31, 2015). Foreign currency forward contracts are used to manage currency risk arising from issuing commercial paper and long-term debt denominated in U.S. dollars (excluding the TELUS International credit facility). Our commercial paper program is fully backstopped by our \$2.25 billion credit facility.

A reduction in TELUS credit ratings could affect our cost of capital and access to capital

Our cost of capital could increase and our access to capital could be affected by a reduction in the credit ratings of TELUS and/or TCI. There can be no assurance that we will maintain or improve current credit ratings.

Risk mitigation: We manage our capital structure and make adjustments to it in light of changes in economic conditions and the risk characteristics of our telecommunications infrastructure. We have financial policies in place that are reviewed annually and are intended to help maintain our existing investment grade credit ratings in the range of BBB+ or the equivalent. The four credit rating agencies that rate TELUS currently have ratings that are in line with this target. A reduction in our ratings, from the current BBB+ or equivalent to BBB, could result in a modest increase in our funding cost but would not be expected to impact our ability to access the public debt markets. Access to our \$2.25 billion credit facility would be maintained, even if our ratings were reduced to below BBB+.

Lower than planned free cash flow could constrain our ability to invest in operations, reduce debt or maintain multi-year dividend growth and share purchase programs

While future free cash flow and sources of capital are expected to be sufficient to meet current requirements, our intention to return capital to shareholders could constrain our ability to invest in our operations for future growth. Funding of future spectrum licence purchases, funding of defined benefit pension plans and any increases in corporate income tax rates will reduce the after-tax cash flow otherwise available to return as capital to our shareholders. Should actual results differ from our expectations, there can be no assurance that we will not change our financing plans, including our intention to pay dividends according to our payout policy guideline and to maintain our dividend growth program. Our multi-year share purchase program may also be affected by our Board’s assessment from time to time of various factors, including our financial position and outlook, and the market price of our Common Shares. For further detail on our multi-year dividend growth program and multi-year NCIB program, see *Section 4.3 Liquidity and capital resources*.

Risk mitigation: Our Board of Directors reviews the dividend each quarter, based on a number of factors, including our financial position and outlook.

Financial instruments

Our financial instruments, and the nature of credit risks, liquidity risks and market risks that they may be subject to, are described in *Section 7.9 Financial instruments, commitments and contingent liabilities*.

10.8 Taxation matters

We are subject to the risk that income and commodity tax amounts, including tax expense, may be materially different than anticipated, and a general tendency by tax collection authorities to adopt more aggressive auditing practices could adversely affect our financial condition and operating results

We collect and pay significant amounts of commodity taxes, such as goods and services taxes, harmonized sales taxes, provincial sales taxes, sales and use taxes and value-added taxes, to various tax authorities. As our operations are complex and the related tax interpretations, regulations, legislation and jurisprudence that pertain to our activities are subject to continual change and evolving interpretation, the final outcome of the taxation of many transactions is uncertain. Moreover, the implementation of new legislation in itself has its own complexities, including those of execution where multiple systems are involved, and interpretation of new rules as they apply to specific transactions, products and services.

We have significant current and deferred income tax liabilities, income tax expenses and cash tax payments. Income tax amounts are based on our estimates, using accounting principles that recognize the benefit of income tax positions only when it is more likely than not that the ultimate determination of the tax treatment of a position will result in the related benefit being realized. The assessment of the likelihood and amount of income tax benefits, as well as the timing of realization of such amounts, can materially affect the determination of Net income or cash flows. We expect the income taxes computed at applicable statutory rates to range between 26.4% and 26.9% in 2017. These expectations can change as a result of changes in interpretations, regulations, legislation or jurisprudence.

The timing concerning the monetization of deferred income tax accounts is uncertain, as it is dependent on our future earnings and other events. The amounts of deferred income tax liabilities are also uncertain, as the amounts are based upon substantively enacted future income tax rates that were in effect at the time, which can be changed by tax authorities. The amounts of cash tax payments and current and deferred income tax liabilities are also based upon our anticipated mix of revenues among the jurisdictions in which we operate, which is also subject to change.

The audit and review activities of tax authorities affect the ultimate determination of the actual amounts of commodity taxes payable or receivable, income taxes payable or receivable, deferred income tax liabilities, taxes on certain items included within capital and income tax expense. Therefore, there can be no assurance that taxes will be payable as anticipated and/or that the amount and timing of receipt or use of the tax-related assets will be as currently expected.

TELUS International operates in certain foreign jurisdictions, including the United States, the United Kingdom, the Philippines, Guatemala, El Salvador, Barbados, Romania and Bulgaria, which increases our exposure to multiple forms of taxation.

Generally, each jurisdiction has taxation peculiarities in the forms of taxation imposed (e.g. value-added tax, gross receipts tax, stamp and transfer tax, and income tax), legislation and tax treaties, where applicable, as well as currency and language differences. In addition, the telecommunications industry faces unique issues that lead to uncertainty in the application of tax laws and the division of tax between domestic and foreign jurisdictions. Furthermore, there has been a more intense political, media and tax authority focus on taxation, with an intent to enhance tax transparency and to address perceived tax abuses. Accordingly, our activities may increase our exposure to tax risks, from both a financial and a reputational perspective.

Risk mitigation: We follow a comprehensive tax conduct and risk management policy that was adopted by our Board. This policy outlines the principles underlying and guiding the roles of team members, their responsibilities and personal conduct, the method of conducting business in relation to tax law and the approaches to working relationships with external tax authorities and external advisors. This policy recognizes the requirement to comply with all relevant tax laws. The components necessary for the effective control and mitigation of tax risk are outlined in the policy, as is the delegation of authority to management on tax matters in accordance with Board and Audit Committee communication guidelines.

In giving effect to this policy, we maintain an internal Taxation department composed of professionals who stay current on domestic and foreign tax obligations, supplemented where appropriate with external advisors. This team reviews systems and process changes for compliance with applicable domestic and international taxation laws and regulations. Its members are also responsible for the specialized accounting required for income taxes.

Material transactions are reviewed by our Taxation department so that transactions of an unusual or non-recurring nature are assessed from multiple risk-based perspectives. Tax-related transaction risks are regularly communicated to, and reassessed by, our Taxation department as a check to initial exposure assessments. As a matter of regular practice, large transactions are reviewed by external tax advisors, while other third-party advisors may also be engaged to express their views as to the potential for tax liability. We continue to review and monitor our activities so that we can take action to comply with any related regulatory, legal and tax obligations. In some cases, we also engage external advisors to review TELUS’ systems and processes for tax-related compliance. The advice and returns provided by such advisors and counsel are reviewed for reasonableness by our internal Taxation team.

10.9 Litigation and legal matters

Investigations, claims and lawsuits

Given TELUS’ size, investigations, claims and lawsuits seeking damages and other relief are regularly threatened or pending against us. It is not currently possible for us to predict the outcome of such matters due to various factors, including: the preliminary nature of some claims; unproven damage theories and demands; incomplete factual records; the uncertain nature of legal theories and procedures and their resolution by the courts, at both the trial and the appellate levels; and the unpredictable nature of opposing parties and their demands. There can be no assurance that financial or operating results will not be negatively impacted by any of these factors.

Subject to the foregoing limitations, management is of the opinion, based upon legal assessments and the information presently available, that it is unlikely that any liability, to the extent not provided for through insurance or otherwise, would have a material effect on our financial position and the results of our operations, excepting the items disclosed herein and in *Note 29(a)* of the Consolidated financial statements.

Risk mitigation: We believe that we have in place reasonable policies and processes designed to enable compliance with legal and contractual obligations and reduce our exposure to, and the effect on us of, legal claims. We also maintain a team of legal professionals who advise on and manage risks related to claims and possible claims. See other risk mitigation steps discussed below.

Class actions

We are defendant in a number of certified and uncertified class actions. Over the past decade or more, we have observed a willingness on the part of claimants to launch class actions whereby a representative plaintiff seeks to pursue a legal claim on behalf of a large group of persons. The number of class actions filed against us has varied from year to year, with claimants continually looking to expand the matters in respect of which they file class actions. The adoption by governments of increasingly stringent consumer protection legislation may increase the number of class actions by creating new causes of action, or may decrease the number of class actions by improving clarity in the area of consumer marketing and contracting. A successful class action lawsuit, by its nature, could result in a sizable damage award that could negatively affect a defendant’s financial or operating results. Certified and uncertified class actions against us are detailed in *Note 29(a)* of the Consolidated financial statements.

Assessment of class actions

We believe that we have good defences to each of these certified and uncertified class actions. Should the ultimate resolution of these actions differ from management’s assessments and assumptions, a material adjustment to our financial position and the results of our operations could result. Management’s assessments and assumptions include that reliable estimates of the exposure cannot be made for the majority of these class actions, considering continued uncertainty relating to the causes of action that may ultimately be pursued by the plaintiffs and certified by the courts and the nature of the damages that may be sought by the plaintiffs.

Risk mitigation: We are vigorously defending each of the class actions brought against TELUS or pursuing settlements that we deem to be beneficial for us. This includes opposing certification of uncertified class actions. Certification is a

procedural step that determines whether a particular lawsuit may be prosecuted by a representative plaintiff on behalf of a class of individuals. Certification of a class action does not determine the merits of the claim, so that, if we were unsuccessful in defeating certification, the plaintiffs would still be required to prove the merits of their claims. We regularly assess our business practices and actively monitor class action developments in Canada and the United States in order to identify and minimize the risk of further class actions against us.

Civil liability in the secondary market

Like other Canadian public companies, we are subject to civil liability for misrepresentations in written disclosure and oral statements, and liability for fraud and market manipulation. Such legislation has been adopted in most provinces and territories.

Risk mitigation: We continually monitor legal developments and annually re-evaluate our disclosure practices and procedures. In addition, we periodically consult external advisors to review our disclosure practices and procedures and the extent to which they are documented. We have a corporate disclosure policy that restricts the role of Company spokespersons to specifically designated members of senior management, provides a protocol for dealing with analysts and oral presentations, and outlines the communication approach to issues, and our Disclosure Committee reviews key disclosure documents.

Legal and ethical compliance

We rely on our employees, officers, Board, key suppliers and other business partners to demonstrate behaviour consistent with applicable legal and ethical standards in all jurisdictions within which we operate including, but not limited to, anti-bribery laws and regulations. Situations might occur where individuals intentionally or inadvertently do not adhere to our policies, applicable laws and regulations or contractual obligations. For instance, there could be cases in which the personal information of a TELUS customer or employee is collected, used or disclosed in a manner that is not fully compliant with legislation, contractual obligations or TELUS policies. In the case of TELUS Health, personal information includes sensitive health information about individuals who are our customers or healthcare providers’ end customers. In addition, there could be situations where compliance programs may not be fully adhered to, or where parties may have a different interpretation of the requirements of particular legislative provisions. These various situations may expose us to litigation and the possibility of damages, sanctions and fines, or of being disqualified from bidding on contracts, and may negatively affect our financial or operating results and reputation.

We continue to expand our activities into the United States and other countries. When operating in foreign jurisdictions, we are required to comply with local laws and regulations, which may differ substantially from Canadian laws and add to the regulatory, legal and tax exposures that we face.

Risk mitigation: Although we cannot predict outcomes with certainty, we believe that we have reasonable policies, controls and processes in place, and levels of awareness sufficient for proper compliance, and that these are having a positive effect on reducing risks. We have a comprehensive code of ethics and conduct for our employees, including officers and directors, and mandatory annual integrity training for employees, officers and identified contractors, as well as a toll-free EthicsLine for anonymous reporting by anyone who may have concerns or complaints to bring forward. In early 2012, we implemented our supplier code of conduct. In 2013, a specific anti-bribery and corruption policy was approved by the Board and communicated to team members. We conduct targeted mandatory training on anti-bribery and corruption, as well as on our business sales code of conduct. We have a designated Chief Data and Trust Officer, whose role is to work across the enterprise to ensure that the business has appropriate processes and controls in place to facilitate legal compliance and report on compliance to the Audit Committee. For example, as a proactive measure on privacy compliance, we require a privacy impact assessment to be carried out in the development stage for major projects involving the use of customer or team member personal information.

We have an established review process to ensure that regulatory, legal and tax requirements are considered when pursuing opportunities outside of Canada. On an ongoing basis, we review our international structure, systems and processes to ensure that we mitigate regulatory, legal and tax risks, as our business activities expand outside Canada. Finally, we engage external counsel and advisors qualified in the relevant foreign jurisdictions to provide regulatory, legal and tax advice, as appropriate.

Defects in software and failures in data or transaction processing

We provide certain applications and managed services to our customers that involve the management, processing and/or storing of data, including sensitive personal medical records, and the transfer of funds. Software defects or failures in data or transaction processing could lead to substantial damage claims (including privacy and medical claims). For instance, a defect in a TELUS Health application could lead to personal injury or unauthorized access to personal information, while a failure in transaction processing could result in the transfer of funds to the wrong recipient.

Risk mitigation: We believe that we have in place reasonable policies, controls, processes (such as quality assurance programs in software development procedures) and contractual arrangements (such as disclaimers, indemnities and

limitations of liability in most cases), as well as insurance coverage, to reduce our exposure to these types of legal claims. However, there can be no assurance that our processes will be followed by all team members at all times and that we have indemnities and limitations of liability covering all cases.

Intellectual property and proprietary rights

Technology evolution also brings additional legal risks and uncertainties. The intellectual property and proprietary rights of owners and developers of hardware, software, business processes and other technologies may be protected under statute, such as patent, copyright and industrial design legislation, or under common law, such as trade secrets. With the growth and development of technology-based industries, the value of these intellectual property and proprietary rights has increased. Significant damages may be awarded in intellectual property infringement claims advanced by rights holders. In addition, defendants may incur significant costs to defend such claims, and that possibility may prompt defendants to settle claims more readily, in part to mitigate those costs. Both of these factors may also encourage intellectual property rights holders to pursue infringement claims more aggressively.

Given the vast array of technologies and systems that we use to deliver products and services, and the rapid change and complexity of such technologies, disputes over intellectual property and proprietary rights can reasonably be expected to increase. As a user of technology, we receive communications from time to time, ranging from solicitations to demands and legal actions from third parties claiming ownership rights over intellectual property used by us and asking for settlement payments or licensing fees for the continued use of such intellectual property.

There can be no assurance that we will not be faced with other significant claims based on the alleged infringement of intellectual property rights, whether such claims are based on a legitimate dispute over the validity of the intellectual property rights or their infringement, or are advanced for the primary purpose of extracting a settlement. We may incur significant costs in defending TELUS against infringement claims, we may suffer significant damages and we could lose the right to use technologies that are essential to our operations should any infringement claim prove successful. As a developer of technology, TELUS Health depends on its ability to protect the proprietary aspects of its technology. The failure to do so adequately could materially affect our business. However, policing unauthorized use of our intellectual property may be difficult and costly.

Assessment of intellectual property claims

We believe that we have good defences to each of the intellectual property claims against us. Should the ultimate resolution of these claims differ from management’s assessments and assumptions, a material adjustment to our financial position and the results of our operations could result. Management’s assessments and assumptions include that reliable estimates of the exposure cannot be made for the majority of these claims considering continued uncertainty relating to the validity of the intellectual property at issue, whether or not technology used by us infringes upon that intellectual property, and the nature of the damages that will be sought by the plaintiffs.

Risk mitigation: We incorporate many technologies into our products and services. However, with the exception of TELUS Health, we are not primarily in the business of creating or inventing technology. In acquiring products and services from suppliers, it is our practice to seek and obtain contractual protections consistent with standard industry practices to help mitigate the risks of intellectual property infringements. It is the practice of TELUS Health to protect its intellectual property rights through litigation and other means.

10.10 Health, safety and environment

Team member health, wellness and safety

Lost work time resulting from team member illness or injury can negatively affect organizational productivity and employee benefit costs.

Risk mitigation: To achieve a positive effect on absenteeism in the workplace, we support a holistic and proactive approach to team member health that involves early intervention, health risk prevention, employee and family assistance, assessment and support services, and disability management. Our health and wellness strategies encourage our team members to develop optimal personal health through three fundamental pillars: active living, wise nutrition and mental resilience. To promote safe work practices, we offer training and orientation programs for team members, contractors and suppliers who access our facilities. There can be no assurance that these health, wellness and safety programs and practices will be effective in all situations.

Concerns related to radio frequency emissions from mobile phones and wireless towers

TELUS understands there are public concerns over potential impacts associated with low levels of non-ionizing radio frequency (RF) emissions from mobile phones and cell towers.

To address these concerns, TELUS looks to recognized experts with peer-reviewed findings and government agencies to provide guidance on potential risks. While a small number of epidemiological studies have revealed that exposure to RF fields might be linked to certain cancers, other studies have not supported this association. Furthermore,

animal laboratory studies have found no evidence that RF fields are carcinogenic for laboratory rodents or cause damage to DNA.

The International Agency for Research on Cancer (IARC) and Health Canada have advised mobile phone users that they can take practical measures to reduce their exposure to RF emissions, such as limiting the length of cellphone calls, using hands-free devices and replacing cellphone calls with text messages. In addition, Health Canada encourages parents to take these same measures to reduce their children’s RF emission exposure, since children are typically more sensitive to a variety of environmental agents. TELUS also offers information and advice with respect to radio frequency emissions on its website.

There can be no assurance that future studies, government regulations or public concerns about the health effects of RF emissions will not have an adverse effect on our business and prospects. For example, public concerns or government action could reduce subscriber growth and usage, and costs could increase as a result of the need to modify handsets, relocate wireless towers and address any incremental legal requirements and product liability lawsuits that might arise or have arisen. See *Class actions* in *Section 10.9 Litigation and legal matters*.

Risk mitigation: Canada’s federal government is responsible for establishing safe limits for signal levels of radio devices. We are confident that the handsets and devices we sell, and our wireless towers and other associated devices, comply, in all material respects, with all applicable Canadian and U.S. government safety standards. We continue to monitor new published studies, government regulations and public concerns about the health impacts of RF exposure.

Concerns related to the environment

A detailed report of our environmental risk mitigation activities can be found in our annual sustainability report at sustainability.telus.com. Environmental issues affecting our business include:

Climate change

Failure of climate change mitigation and adaptation efforts is identified as the largest global risk in terms of impact and third-largest in terms of likelihood, according to a World Economic Forum 2016 report. This could affect our business operations through potential disruption of our operations, damage to our infrastructure and the effects on the communities we serve caused by events such as those described in *Section 10.11 Human-caused and natural threats*.

Waste and waste recycling; water consumption

Several areas of our operations raise environmental considerations such as the handling and disposal of waste, electronic waste or other residual materials, appropriate management of our water use and the appropriate handling of materials and electronic equipment we use or sell. Aspects of our operations are subject to evolving and increasingly stringent federal, provincial and local environmental, health and safety law and regulations. Such laws and regulations impose requirements with respect to matters such as the release of substances into the environment, corrective and remedial action concerning such releases, and the proper handling and management of substances including wastes. Evolving public expectations and increasingly stringent laws and regulations could result in increased costs of compliance, while failure to recognize and adequately respond to the same could result in fines, regulatory scrutiny, or damage to our reputation and brand.

Fuel systems

We own or lease a large number of properties. We have fuel systems for backup power generation at some of these properties that enable us to provide reliable service, but they also pose an environmental risk. Because diesel spills or releases from these systems are infrequent, a significant portion of this risk is associated with sites contaminated by our earlier practices or by previous owners.

Failure to recognize and adequately respond to changing government and public expectations regarding environmental matters could result in fines, regulatory scrutiny or damage to our brand.

Risk mitigation: Our climate change strategy includes a mitigation component focusing on absolute energy use and carbon dioxide emission (CO₂e) equivalent reduction; an adaptation component focusing on business continuity planning and readiness for the potential effects of a changing climate on our operations (see *Section 10.11 Human-caused and natural threats*); and an innovation component to help customers realize their climate change targets through product and service solutions. Our target is a 25% reduction in CO₂e from 2010 levels by 2020 and a 10% reduction in energy use over the same period. We are working to achieve these targets through a comprehensive energy management program focused on real estate transformation and consolidation (including leadership in energy and environmental design (LEED) standards certification), as well as network efficiency and technology upgrades. Greater use of video-conferencing and teleconferencing solutions in lieu of travel, decreasing the size and improving the efficiency of our fleet, and educating our team members are also helping us to reach our targets. We have also invested in renewable energy solutions and green building technology, such as the innovations implemented at our new LEED platinum-certified TELUS Garden office tower in Vancouver.

We have an e-waste management program that specifies approved recycling channels for both our external and internal electronic products. We regularly examine our waste streams to identify new ways of reducing our impact on the environment through the diversion of waste from landfills, and in 2015, we set new corporate waste diversion targets focused on reducing our landfilled waste over the next five years. Our waste and recycling strategy is focused on education and awareness programs, as well as the expansion of recycling infrastructure in our administrative buildings.

Fuel system risk is being addressed through a program to install containment and monitoring equipment at sites with systems of qualifying size. All of our remote sites, which rely on diesel generators for 24/7 power, have now been fully upgraded with industry-leading spill containment. We are also leveraging our wireless network and using IoT technology to monitor these sites remotely. We have an ongoing program to assess and remediate contamination issues relating to historical activities and we disclose and report on these issues to regulatory bodies, as appropriate.

10.11 Human-caused and natural threats

Natural disasters and intentional threats to our infrastructure and business operations

We are a key provider of essential telecommunications infrastructure in Canada, and we have business operations located in North America, Central America, Asia and Europe. Our networks, information technology, physical assets, team members, business functions, supply chain and business results may be materially impacted by exogenous threats, including:

- Environment impacts, such as fire, weather-related events, seismic events and other natural disasters
- Disruptions of critical infrastructure, such as power loss and telecommunications failures
- Intentional threats such as cyberattacks, labour disputes, theft, vandalism, sabotage, and political and civil unrest
- Public health threats, such as pandemics.

Risk mitigation: We have an enterprise-wide business continuity program, which is aligned with our corporate philosophy, that includes: ensuring the safety of our team members, minimizing the impacts of a threat to our facilities and business operations, maintaining service to our customers and keeping our communities connected. These priorities have been demonstrated in a number of disruptive events, such as the Fort McMurray wildfires in 2016.

Our business continuity program aligns with current standards and business practices, and encompasses mitigation, preparedness, response, recover and ongoing program improvements. The program focuses on mitigating the impacts of a disruption to our facilities, workforce, technology or supply chain. Although we have business continuity planning processes in place, there can be no assurance that specific events or a combination of events will not disrupt our operations or materially affect our financial results.

The ongoing optimization of our disaster recovery capability for our IT and telecommunications network assets is a key and continued focus for preventing outages and reducing the impact to our critical technology, as well as for driving closer alignment of IT and network recovery capability with business demands. However, while disaster recovery is a focus for TELUS, not all of our systems have recovery and continuity capabilities.

Mitigation initiatives to address climate-related threats are also a current focus and include enhanced weather monitoring, improved incident management processes, climate incident playbooks, and a focus on organizational resilience.

Security

We have a number of assets that are subject to intentional threats. These include physical assets that are subject to security risks such as vandalism and/or theft, including (but not limited to) distributive copper cable, corporate stores, network and telephone switch centres, and elements of corporate infrastructure, as well as IT systems and networks that we operate. The latter are subject to cyber attacks, which are intentional attempts to gain unauthorized access to our information systems and networks for unlawful or improper purposes. Cyber attackers may use a range of techniques, from manipulating people to using sophisticated malicious software and hardware on a single or distributed basis. Some cyber attacks use a combination of techniques in their attempt to evade safeguards, such as the firewalls, intrusion prevention systems and antivirus software found in our systems and networks. The risk and consequences of intentional threats to our non-physical assets, including cyber attacks, can surpass physical security risks due to the rapidly evolving scope and sophistication of these threats.

A successful disruption of our systems, networks and infrastructure, or those belonging to our suppliers or other companies, may prevent us from providing reliable service, allow for the unauthorized interception, destruction, use or dissemination of our information or our customers’ information, and may prevent us from operating our networks. Such disruption or unauthorized access to information could cause us to lose customers and revenue, incur expenses, suffer reputational and goodwill damages, and could subject us to litigation or governmental investigation and sanction. The costs of such events could include liability for information loss, as well as the costs of repairs to infrastructure and

systems and any incentives offered to customers and business partners in order to retain their business. Our insurance may not cover, or fully reimburse us for, these costs and losses.

Risk mitigation: We have implemented measures and processes that mitigate the risk of intentional threats and disruptive events. We have security policies, controls and monitoring systems in place that consider factors such as asset importance, protection of our team members, exposure risks and potential costs incurred should a particular asset be damaged or stolen. We use technical capabilities, including cyber threat intelligence, testing, intrusion prevention/detection and incident response capabilities to help identify and respond to possible cyber threats, and adjust our security measures accordingly. The security team centralizes responsibility for physical and cybersecurity, works with law enforcement and other agencies, and advocates for legislative changes that address the ongoing threat of cyber attacks. While TELUS has reasonable physical security and cybersecurity programs in place, there can be no assurance that specific security incidents will not materially affect our operations and financial results.

10.12 Economic growth and fluctuations

Slow or uneven economic growth and low oil prices may adversely affect us

We estimate economic growth in Canada will be approximately 1.8% in 2017 (see *Economic growth* in Section 1.2), but this growth may be influenced by developments outside of Canada. In addition, macroeconomic risks in Canada include concerns about low oil prices and high levels of consumer and mortgage debt, which may cause consumers to reduce discretionary spending, even in a growing economy.

Economic uncertainty may cause consumers and business customers to delay new service purchases, reduce volumes of use, discontinue use of services or seek lower-priced alternatives from TELUS or from competitors. Ongoing weakness in the extractive energy sector has had a significant impact on Western Canada, including lower levels of investment and employment. This may be partially mitigated by declining costs in non-extractive industries, such as manufacturing, which may experience growth if the U.S. dollar strengthens. The prolonged economic downturn in Western Canada is expected to improve marginally, with recent economic forecasts pointing to mildly positive growth in 2017. However, continued weakness in the economy of Western Canada, particularly if energy prices remain low, could adversely impact our customer growth, revenue, profitability and free cash flow, and could potentially require us to record impairments to the carrying value of our assets, including, but not limited to, our intangible assets with indefinite lives (spectrum licences and goodwill). Impairments to the carrying value of our assets would result in a charge to earnings and a reduction in owners’ equity, but would not affect cash flow.

In 2016, the Canadian dollar exchange rate with the U.S. dollar was volatile. Persistently lower oil prices and changes the new U.S. presidential administration may enact, as well as certain U.S. monetary policy changes, may put further downward pressure on the Canadian dollar relative to the U.S. dollar in 2017. Certain of our revenues, capital asset acquisitions and operating costs are denominated in U.S. dollars. Therefore, a continuing weakness in the Canadian dollar to U.S. dollar exchange rate may negatively impact our financial and operating results. Additionally, certain capital asset acquisitions and inventory purchases from outside Canada, although priced in Canadian dollars, may be negatively impacted by a continuing weakness in the Canadian dollar to U.S. dollar exchange rate.

Risk mitigation: While economic risks cannot be completely mitigated, our top priority is putting customers first and pursuing global leadership in the likelihood of our clients to recommend our products, services and people. We will also support customers negatively affected by lower oil prices with cost-effective solutions that help them realize efficiencies in their operations, and we will continue to pursue cost reduction and efficiency initiatives in our own business (see discussions in Section 2.2 *Strategic imperatives*, and Section 3 *Corporate priorities*). See Section 4.3 *Liquidity and capital resources* for our capital structure financial policies and plans. Our foreign currency exchange risk management includes the use of foreign currency forward contracts and currency options to fix the exchange rates on U.S. dollar-denominated transactions, commitments, commercial paper and U.S. Dollar Notes, but does not eliminate this risk entirely.

Pension funding

Economic and capital market fluctuations could adversely affect the investment performance, funding and expense associated with the defined benefit pension plans that we sponsor. Our pension funding obligations are based on certain actuarial assumptions relating to expected plan asset returns, salary escalation, retirement ages, life expectancy, the performance of the financial markets and future interest rates.

The employee defined benefit pension plans, in aggregate, were in a \$79 million deficit position at December 31, 2016 (2015 – \$53 million deficit position). Our solvency position, as determined under the *Pension Benefits Standards Act, 1985*, was estimated to be a surplus of \$294 million (2015 – deficit of \$92 million). There can be no assurance that our pension expense and funding of our defined benefit pension plans will not increase in the future and thereby negatively impact earnings and/or cash flow. Defined benefit funding risks may arise if total pension liabilities exceed the total value of the respective plan assets in trust funds. Unfunded differences may arise from lower than expected investment returns, changes to mortality and other assumptions, reductions in the discount rate used to value pension

liabilities, changes to statutory funding requirements and actuarial losses. While employee defined benefit pension plan re-measurements will cause fluctuations in other comprehensive income, these re-measurements will never be subsequently reclassified to income.

Risk mitigation: We seek to mitigate this risk through the application of policies and procedures designed to control investment risk and through ongoing monitoring of our funding position. Our best estimate of cash contributions to our defined benefit pension plans is \$65 million in 2017 (\$70 million in 2016).

11. Definitions and reconciliations

11.1 Non-GAAP and other financial measures

We have issued guidance on and report certain non-GAAP measures that are used to evaluate the performance of TELUS, as well as to determine compliance with debt covenants and to manage our capital structure. As non-GAAP measures generally do not have a standardized meaning, they may not be comparable to similar measures presented by other issuers. Securities regulations require such measures to be clearly defined, qualified and reconciled with their nearest GAAP measure.

Adjusted Net income and adjusted basic earnings per share: These measures are used to evaluate performance at a consolidated level and exclude items that may obscure the underlying trends in business performance. These measures should not be considered alternatives to Net income and basic earnings per share in measuring TELUS’ performance. Items that may, in management’s view, obscure the underlying trends in business performance include significant gains or losses associated with real estate redevelopment partnerships, gains on the exchange of wireless spectrum licences, restructuring and other costs, long-term debt prepayment premiums (when applicable), income tax-related adjustments and asset retirements related to restructuring activities. (See *Analysis of Net income* and *Analysis of basic EPS* in *Section 1.3*).

Capital intensity: This measure is calculated as capital expenditures (excluding spectrum licences) divided by total operating revenues. This measure provides a basis for comparing the level of capital expenditures to those of other companies of varying size within the same industry.

Dividend payout ratio: This is a historical measure calculated as the sum of the last four quarterly dividends declared per Common Share, as reported in the Consolidated financial statements, divided by the sum of basic earnings per share for the most recent four quarters for interim reporting periods. For fiscal years, the denominator is annual basic earnings per share. Our policy guideline for the annual dividend payout ratio is on a prospective basis, rather than on a trailing basis, and is 65 to 75% of sustainable earnings per share on a prospective basis. (See *Section 7.5 Liquidity and capital resource measures*.)

Calculation of Dividend payout ratio

Years ended December 31 (\$)	2016	2015
Numerator – sum of the last four quarterly dividends declared per Common Share	1.84	1.68
Denominator – Net income per Common Share	2.06	2.29
Ratio (%)	89	73

Dividend payout ratio of adjusted net earnings: This ratio is a historical measure calculated as the sum of the last four quarterly dividends declared per Common Share, as reported in the financial statements, divided by adjusted net earnings per share. Adjusted net earnings per share is basic earnings per share, as used in the **Dividend payout ratio**, adjusted to exclude the gain on the exchange of wireless spectrum licences, net gains and equity income from real estate joint venture developments, business acquisition-related provisions, immediately vesting transformative compensation (transformative compensation) expense, long-term debt prepayment premium (when applicable) and income tax-related adjustments.

Calculation of Dividend payout ratio of adjusted net earnings

Years ended December 31 (\$)	2016	2015
Numerator – sum of the last four quarterly dividends declared per Common Share	1.84	1.68
Adjusted net earnings (\$ millions):		
Net income attributable to Common Shares	1,223	1,382
Deduct net gains and equity income from real estate joint venture developments, after income taxes	(16)	—
Deduct gain on the exchange of wireless spectrum licences, after income taxes	(13)	—
Add back business acquisition-related provisions, after income taxes	15	—
Add back transformative compensation expense, after income taxes	224	—
Add back net unfavourable (deduct net favourable) income tax-related adjustments	(17)	1
	1,416	1,383
Denominator – Adjusted net earnings per Common Share	2.39	2.29
Adjusted ratio (%)	77	73

Earnings coverage: This measure is defined in the Canadian Securities Administrators’ National Instrument 41-101 and related instruments, and is calculated as follows:

Calculation of Earnings coverage

Years ended December 31 (\$ millions, except ratio)	2016	2015
Net income attributable to Common Shares	1,223	1,382
Income taxes (attributable to Common Shares)	423	524
Borrowing costs (attributable to Common Shares) ¹	540	503
Numerator	2,186	2,409
Denominator – Borrowing costs	540	503
Ratio (times)	4.0	4.8

¹ Interest on Long-term debt plus Interest on short-term borrowings and other plus long-term debt prepayment premium, adding back capitalized interest and deducting borrowing costs attributable to non-controlling interests.

EBITDA (earnings before interest, income taxes, depreciation and amortization): We have issued guidance on and report EBITDA because it is a key measure used to evaluate performance at a consolidated level and segment contribution. EBITDA is commonly reported and widely used by investors and lending institutions as an indicator of a company’s operating performance and ability to incur and service debt, and as a valuation metric. EBITDA should not be considered an alternative to Net income in measuring TELUS’ performance, nor should it be used as an exclusive measure of cash flow. EBITDA as calculated by TELUS is equivalent to Operating revenues less the total of Goods and services purchased expense and Employee benefits expense.

We calculate EBITDA – excluding restructuring and other costs, as it is a component of the **EBITDA – excluding restructuring and other costs interest coverage** ratio and the **Net debt to EBITDA – excluding restructuring and other costs** ratio.

We may also calculate an adjusted EBITDA to exclude items of an unusual nature that do not reflect our ongoing operations and should not, in our opinion, be considered in a valuation metric, or should not be included in an assessment of our ability to service or incur debt.

EBITDA reconciliation

Years ended December 31 (\$ millions)	2016	2015
Net income	1,236	1,382
Financing costs	520	447
Income taxes	426	524
Depreciation	1,564	1,475
Amortization of intangible assets	483	434
EBITDA	4,229	4,262
Restructuring and other costs included in EBITDA ¹	479	226
EBITDA – excluding restructuring and other costs	4,708	4,488
Deduct gain on the exchange of wireless spectrum licences	(15)	—
Deduct net gains and equity income from real estate joint venture developments	(26)	—
Adjusted EBITDA	4,667	4,488

1 Includes transformative compensation expense of \$305 million recorded in other costs in the fourth quarter of 2016.

EBITDA – excluding restructuring and other costs interest coverage: This measure is defined as EBITDA – excluding restructuring and other costs, divided by Net interest cost, calculated on a 12-month trailing basis. This measure is similar to the coverage ratio covenant in our credit facilities, as described in *Section 7.6 Credit facilities*).

Free cash flow: We report this measure as a supplementary indicator of our operating performance. It should not be considered an alternative to the measures in the Consolidated statements of cash flows. Free cash flow excludes certain working capital changes (such as trade receivables and trade payables), proceeds from divested assets and other sources and uses of cash, as found in the Consolidated statements of cash flows. It provides an indication of how much cash generated by operations is available after capital expenditures (excluding purchases of spectrum licences) that may be used to, among other things, pay dividends, repay debt, purchase shares or make other investments. Free cash flow may be supplemented from time to time by proceeds from divested assets or financing activities.

Free cash flow calculation

Years ended December 31 (\$ millions)	2016	2015
EBITDA	4,229	4,262
Deduct gain on the exchange of wireless spectrum licences	(15)	—
Deduct net gains and equity income from real estate joint venture developments	(26)	—
Deduct non-cash gains from the sale of property, plant and equipment	(17)	—
Restructuring and other costs, net of disbursements	24	97
Items from the Consolidated statements of cash flows:		
Share-based compensation	(2)	(38)
Net employee defined benefit plans expense	93	118
Employer contributions to employee defined benefit plans	(71)	(94)
Interest paid	(510)	(458)
Interest received	4	24
Capital expenditures (excluding spectrum licences)	(2,968)	(2,577)
Free cash flow before income taxes	741	1,334
Income taxes paid, net of refunds	(600)	(256)
Free cash flow	141	1,078

The following reconciles our definition of free cash flow with cash provided by operating activities.

Free cash flow reconciliation with Cash provided by operating activities

Years ended December 31 (\$ millions)	2016	2015
Free cash flow	141	1,078
Add (deduct):		
Capital expenditures (excluding spectrum licences)	2,968	2,577
Adjustments to reconcile to Cash provided by operating activities	110	(99)
Cash provided by operating activities	3,219	3,556

Net debt: We believe that net debt is a useful measure because it represents the amount of Short-term borrowings and long-term debt obligations that are not covered by available Cash and temporary investments. The nearest IFRS measure to net debt is Long-term debt, including Current maturities of Long-term debt. Net debt is a component of the **Net debt to EBITDA – excluding restructuring and other costs** ratio.

Calculation of Net debt

As at December 31 (\$ millions)	2016	2015
Long-term debt including current maturities	12,931	12,038
Debt issuance costs netted against long-term debt	67	52
Derivative liabilities (assets), net	20	(14)
Accumulated other comprehensive income amounts arising from financial instruments used to manage interest rate and currency risks associated with U.S. dollar-denominated long-term debt (excluding tax effects)	(34)	—
Cash and temporary investments	(432)	(223)
Short-term borrowings	100	100
Net debt	12,652	11,953

Net debt to EBITDA – excluding restructuring and other costs: This measure is defined as net debt at the end of the period divided by 12-month trailing EBITDA – excluding restructuring and other costs. Our long-term policy guideline for this ratio is from 2.00 to 2.50 times. (See discussion in *Section 7.5 Liquidity and capital resource measures.*) This measure is similar to the leverage ratio covenant in our credit facilities, as described in *Section 7.6 Credit facilities.*

Net interest cost: This measure is the denominator in the calculation of **EBITDA – excluding restructuring and other costs interest coverage**. Net interest cost is defined as financing costs, excluding capitalized long-term debt interest, employee defined benefit plans net interest and recoveries on redemption and repayment of debt, calculated on a 12-month trailing basis. No recoveries on redemption and repayment of debt were recorded in 2016 and 2015. Expenses recorded for the long-term debt prepayment premium, if any, are included in net interest cost. Net interest cost was \$566 million in 2016 and \$465 million in 2015.

Restructuring and other costs: With the objective of reducing ongoing costs, we incur associated incremental, non-recurring restructuring costs. We may also incur atypical charges when undertaking major or transformational changes to our business or operating models. We also include incremental external costs incurred in connection with business acquisition or disposition activity, as well as litigation costs, in the context of significant losses and settlements, in other costs.

In the fourth quarter of 2016, we made transformative compensation lump-sum payments to substantially all of our existing unionized and non-unionized Canadian-situated workforces recorded in other costs. For the unionized and non-unionized workforces, approximately 40% of the after-tax value of such qualifying lump-sum payments was paid in our Common Shares by way of an employee benefit trust.

Components of restructuring and other costs

Years ended December 31 (\$ millions)	2016	2015
Goods and services purchased	62	70
Employee benefits expense ¹	417	156
Restructuring and other costs included in EBITDA	479	226

¹ Includes transformative compensation expense of \$305 million recorded in other costs in the fourth quarter of 2016.

11.2 Operating indicators

The following measures are industry metrics that are useful in assessing the operating performance of a wireless and wireline telecommunications entity, but do not have a standardized meaning under IFRS-IASB.

Average revenue per subscriber unit per month (ARPU) for wireless subscribers is calculated as network revenue divided by the average number of subscriber units on the network during the period and is expressed as a rate per month.

Churn per month (or churn) is calculated as the number of subscriber units deactivated during a given period divided by the average number of subscriber units on the network during the period and is expressed as a rate per month. A TELUS, Koodo or Public Mobile brand prepaid wireless subscriber is deactivated when the subscriber has no usage for 90 days following expiry of the prepaid credits.

Cost of acquisition (COA) consists of the total of the device subsidy (the device cost to TELUS less the initial charge to the customer), commissions, and advertising and promotion expenses related to the initial subscriber acquisition during a given period. As defined, COA excludes costs to retain existing subscribers (retention spend).

COA per gross subscriber addition is calculated as the cost of acquisition divided by the gross subscriber activations during the period.

Retention spend to network revenue represents direct costs associated with marketing and promotional efforts (including device subsidies and commissions) aimed at the retention of the existing subscriber base, divided by network revenue.

Wireless subscriber unit (subscriber) is defined as an active mobile recurring revenue-generating unit (e.g. mobile phone, tablet or mobile Internet key) with a unique subscriber identifier (SIM or IMEI number). In addition, TELUS has a direct billing or support relationship with the user of each device. Subscriber units exclude machine-to-machine (M2M) devices (a subset of the Internet of Things), such as those used for asset tracking, remote control monitoring and meter readings, vending machines and wireless automated teller machines.

Wireline subscriber connection is defined as an active recurring revenue-generating unit that has access to stand-alone services, including fixed Internet access, TELUS TV and residential network access lines (NALs). In addition, TELUS has a direct billing or support relationship with the user of each service. Reported subscriber units exclude business NALs as the impact of migrating from voice lines to IP services has led to business NAL losses without a similar decline in revenue, thus diminishing its relevance as a key performance indicator.