

**THE FUTURE ENVIRONMENT
FACING THE CANADIAN BROADCASTING SYSTEM**

**a report prepared pursuant to
section 15
of the
*Broadcasting Act***

14 December 2006

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Introduction

1. On 8 June 2006, the Governor in Council issued Order in Council P.C. 2006-519 (the OIC), pursuant to section 15 of the *Broadcasting Act* (the Act). The OIC, a copy of which is appended in Appendix II of this report, requested that the Commission provide a factual report on the future environment facing the whole broadcasting system.
2. In the OIC, the Governor in Council:
 - noted that the evolution of audio-visual technologies is profoundly changing how Canadians communicate, express themselves and interact with various media, bringing with it important economic and social implications and leading to a new communications and media environment;
 - stated that the Government is of the view that the Canadian broadcasting system, using various audio-visual technologies, must remain relevant in a global digital environment; and
 - stated that Canada should continue to play a leading role in the development and usage of world class communications technologies while fostering Canadian cultural choices and broadening public access to local, regional, national and international information and programming.
3. For these reasons, the Governor in Council requested that the Commission provide a factual report on the future environment facing the Canadian broadcasting system.
4. To fulfil the request set out in the OIC, the Commission issued *Call for comments on a request by the Governor in Council pursuant to section 15 of the Broadcasting Act to prepare a report examining the future environment facing the Canadian broadcasting system*, Broadcasting Public Notice CRTC 2006-72, 12 June 2006 (Public Notice 2006-72). The purpose of the call for comments was to gather information from the public addressing the points set out in the OIC. This information would then be used to inform the Government of Canada's policy determinations with respect to the future of broadcasting in Canada, as well as the Commission's review of certain aspects of its regulatory framework for over-the-air television.
5. The Commission received 52 submissions from individuals, consumer groups, broadcasters, distributors and industry associations, all of which form part of this proceeding's public record. The Commission reviewed the submissions in detail and considers them an integral part of this report. The Commission thanks all of the parties of record for their valuable contribution to this process.

6. To assist in the process, the Commission also commissioned the following three independent research studies:
 - a report prepared by Solutions Research Group Consultants Inc. (SRG), which provides a custom analysis of technology and media trends based on SRG's ongoing *Fast Forward*TM trend study (the SRG report);
 - a report prepared by Michael McEwen entitled *A Report to the CRTC on Digital Transition Strategies in a Number of Different Countries*, which examines various countries' broadcast digital transition, including high definition television, regulations, policies and experiences that are relevant to the Canadian experience (the McEwen report); and
 - a report prepared by Canadian Media Research Inc. (CMRI) entitled *How Many Canadians Subscribe to Cable TV and Satellite TV*, which provides cable and direct-to-home subscriber estimates, profiles of non-subscribers and special survey results (the CMRI report).
7. All three reports form part of this proceeding's public record. The Commission also used in-house information that it acquires in the normal course of its regulatory mandate including its Broadcasting Policy Monitoring Reports and the Statistics Canada financial and operational annual returns that licensees file with the Commission.
8. All of the submissions by the parties of record and the three studies commissioned by the Commission for this proceeding may be found at the following Internet site:
www.crtc.gc.ca.
9. In structuring the report, the Commission followed the order of the points as set out in the OIC.
 - Section I addresses the current state of audio-visual technologies and their evolution over the coming years.
 - Section II discusses how Canadians use the various technologies and the impact this usage will have on programming content and services.
 - Section III addresses the impact that the adoption of these technologies will have on the Canadian broadcasting system in terms of consumers, broadcasters, distributors, independent producers and the provision of local, regional and national programming.

Section IV contains the Concluding Observations.

10. In preparing the report, the Commission focused on the information in the submissions that specifically addressed the points set out in the OIC and attempted to include as many different positions of parties as possible. However, given the volume of material received, the Commission, in the interest of brevity, consolidated common points-of-view amongst the various interested parties.

Section I: Evolution of technologies

A. Broadcasting services' current state and predicted evolution

11. This section examines the current state of the audio, video and distribution broadcasting services available to Canadians, including the number of services, advertising revenues and profitability, technical features and the predicted evolution of those broadcasting technologies in the coming years.

1. Audio

a) Licensed radio services

12. The number of each type of licensed Canadian radio and audio service, as of 21 November 2006, is set out in the following table. The numbers in brackets indicate the number of each corresponding undertaking in the 2002 broadcast year.

Table 1 Canadian radio and audio services				
	English language (1)	French language (2)	Third language	Total
Over-the-air radio services				
National public broadcaster				
CBC: Radio One / Première chaîne	36 (36)	20 (20)	- -	56 (56)
CBC: Radio Two / Espace musique	14 (14)	12 (10)	- -	26 (24)
CBC network licences	2 (2)	2 (2)	- -	4 (4)
CBC digital: Radio One / Première chaîne	5 (4)	4 (3)	- -	9 (7)
CBC digital: Radio Two / Espace musique	5 (4)	4 (3)	- -	9 (7)
Private commercial				
AM stations	158 (189)	19 (17)	12 (9)	189 (215)
FM stations	380 (216)	88 (65)	9 (6)	477 (287)
AM and FM network licences	27 (n/a)	9 (n/a)	- -	36 (n/a)
Digital radio (stand-alone and transitional)	42 (35)	9 (4)	7 (3)	58 (42)
Community				
Type A stations (3)	11 (9)	34 (27)	- -	45 (36)
Type B stations	22 (13)	26 (19)	1 -	49 (32)
Developmental	8 (n/a)	- (n/a)	- -	8 (n/a)
Campus				
Community-based	36 (33)	5 (5)	- -	41 (38)
Instructional	9 (8)	- (1)	- -	9 (9)
Developmental	1 (n/a)	1 (n/a)	- -	2 (n/a)
Aboriginal – Type B stations (3)	41 (32)	12 (5)	- -	53 (37)
Religious (spoken word and/or music)	41 (4)	25 (20)	1 -	67 (24)

	English language (1)	French language (2)	Third language	Total
Other (tourist/traffic; Environment Canada. special event, etc.)	96 (n/a)	13 (n/a)	1 -	110 (n/a)
Total number of over-the-air Canadian radio services	934	283	31	1,248
Multi-channel subscription radio services				
Satellite	2 -	- -	- -	2 -
Terrestrial ⁽⁴⁾	1 -	- -	- -	1 -
Audio services delivered by BDUs				
Specialty audio (commercial / Non-profit, regional / national)	5 -	- -	4 -	9 -
Pay audio (English and French national services)	2 -	- -	- -	2 -
Total number of Canadian radio and audio services	944	283	35	1,262
(1) Includes bilingual (English and French) and native services. (2) Includes French-native services. (3) Includes network licences. (4) Authorised not yet licensed. Excludes rebroadcasters and exempt radio services. Sources: CRTC APP 1205 report (21 November 2006), CRTC Decisions				

13. Between 1 September 2002 and 21 November 2006, the number of English-language commercial FM radio stations increased to 380 while the number of AM stations declined to 158. The number of French-language FM stations increased to 88 while the number of AM stations declined to 19.
14. The following table sets out, by language and type of station, the number of radio applications approved by the Commission from 1 January 2003 to 31 December 2005.

Table 2 Number of new over-the-air radio stations approved from 1 January 2003 to 31 December 2005

	2003	2004	2005	Total
Total number of new AM & FM stations approved:	68	49	44	161
English-language stations	51	43	38	132
French-language stations	12	5	4	21
Ethnic-language stations	5	1	2	8
Type of radio stations approved:				
Commercial	32	25	33	90
Community	11	10	8	29
Campus	4	2	-	6
Native	7	2	-	9
Other	14	10	3	27

Notes: Includes AM to FM conversions (often referred to as flips).
Excludes digital transitional radio.

"Other" includes not for profit, CBC/SRC, tourist, Environment Canada, etc., radio stations
Sources: CRTC APP 1100 report and CRTC Decisions issued from 1 January 2003 to 31 December 2005

15. Of the 90 commercial radio stations approved, approximately 50% were conversions of AM stations to the FM band. The majority of approvals were for undertakings in Ontario, followed by Alberta. Most of the conversions occurred in Ontario, followed by Quebec.

b) Financial data

i. Advertising revenue by media (\$ million)

16. As set out in the table below, radio is doing well in comparison to other media. Between 2000 and 2005, radio's share of media advertising rose from 13.9% to 14.7%. Although in their infancy, Internet revenues garnered 1.5% in 2000, increasing to 5.8% in 2005.

Table 3 Advertising revenue by media (\$ millions)

Media	2000	2001	2002	2003	2004	2005
Television	2,454	2,547	2,595	2,821	2,939	3,013
Daily Newspaper	1,731	1,678	1,684	1,696	1,751	1,784
Radio	1,001	1,048	1,080	1,171	1,209	1,310
Magazine	805	845	900	950	994	1,028
Weekly Newspaper	820	836	849	862	875	883
Billboard	293	310	321	338	356	404
Internet	110	97	117	237	364	519
Total	7,214	7,361	7,546	8,075	8,488	8,941
% Radio	13.9%	14.2%	14.3%	14.5%	14.2%	14.7%

*Note: Daily newspaper revenues exclude classified ads
Source: Carat Expert, May 2006*

ii. Revenues of private commercial radio – 2000 to 2005

17. As shown in Table 4, the revenues of conventional AM and FM stations, including those of ethnic stations, grew by 30% between 2000 and 2005. Of this, combined English- and French-language AM revenues dropped by 5.0%. Individually, English-language AM dropped by 2.2% and French-language AM dropped by 33.4%, the latter to a five-year low of \$17.8 million.

Table 4 Revenues - Private commercial radio (\$ 000) – Broadcast year ending 31 August

Radio type	2000	2001	2002	2003	2004	2005
English AM	270,599	263,608	253,029	259,804	259,506	264,730
English FM	563,274	607,066	641,676	701,416	740,698	825,222
Total - English	873,872	870,674	894,705	961,220	1,000,204	1,089,952
French AM	26,721	24,899	24,996	26,067	22,668	17,784
French FM	137,691	146,123	155,042	172,882	172,577	191,219
Total – French	164,412	171,022	180,038	198,949	195,245	209,003
Ethnic AM	17,798	18,280	18,705	19,602	20,321	21,326
Ethnic FM	9,418	9,629	9,284	9,834	10,551	13,085
Total – Ethnic	27,216	27,909	27,989	29,436	30,872	34,411
Total AM	315,118	306,787	296,730	305,473	302,495	303,840
Total FM	710,383	762,818	806,002	884,132	923,826	1,029,526
Total Canada	1,025,501	1,069,605	1,102,732	1,189,605	1,226,321	1,333,366

Note: Includes network results

Source: CRTC Financial database

18. The combined revenues of English- and French-language FM stations increased by 45% between 2002 and 2005. Individually, English-language FM revenues increased by 46.5% while French-language FM revenues increased by 38.9%. This growth in the FM segment more than offset the contraction in the AM industry segment during this same period. Revenues for both AM and FM ethnic radio stations rose by 19.8% and 38.9%, respectively, over the same period. Currently, there are 21 private commercial, over-the-air ethnic radio stations authorised to serve the following markets: Vancouver (5), Edmonton, Calgary and Winnipeg (1 each), Toronto (8), Montreal (4) and Ottawa (1).
19. In considering these statistics, it should be noted that, as shown in Table 2, between 2002 and May 2006, the number of AM stations declined by 29 to 186 as some licensees converted their AM stations to FM. However, as over 80% of these conversions involved English-language stations, this would suggest that French-language AM radio is experiencing some difficulty. English-language AM stations are faring slightly better; while their revenues fell by 5% over the period, they showed a modest gain of 2.0% in 2005.
20. Table 5 below, illustrates that, overall, English-language AM stations reported negative to marginally positive profit before interest and taxes (PBIT) margins between 2000 and 2004. While reporting a PBIT increase to 6.5% in 2005, this figure represents only one year and cannot be considered an indication of a turn-around as yet. French-language AM stations have reported negative PBIT's in all years, culminating in a low of -37.4% in 2005.

Table 5 Profit before interest and taxes (PBIT) margins - Private commercial radio

Radio type	2000	2001	2002	2003	2004	2005
English AM	-4.8 %	-6.1 %	-7.7 %	1.08%	1.9 %	6.5 %
English FM	27.3 %	26.7 %	25.9 %	27.6 %	25.9 %	28.2 %
Total - English	16.9 %	16.80 %	16.4 %	20.4 %	19.7 %	22.9 %
French AM	-12.6 %	-8.2 %	-7.5 %	-9.9 %	-20.9 %	-37.4 %
French FM	20.1 %	17.6 %	18.9 %	19.5 %	16.2 %	15.7 %
Total - French	14.7 %	13.8 %	15.3 %	15.6 %	11.8 %	11.14 %
Ethnic AM	7.8 %	5.9 %	7.6 %	9.5 %	15.6 %	12.8 %
Ethnic FM	4.1 %	2.08 %	-3.1 %	3.4 %	4.3 %	7.0 %
Total - Ethnic	6.5 %	4.6 %	4.0 %	7.4 %	11.7 %	10.6 %
Total AM	-4.8 %	-5.5 %	-6.7 %	0.7 %	1.1 %	4.4 %
Total FM	25.6 %	24.7 %	24.2 %	25.7 %	23.9 %	25.6 %
Total - Canada	16.3 %	16.0 %	15.9 %	19.3 %	18.3 %	20.8 %

Source: CRTC Financial database

21. In comparison, both English- and French-language FM stations are doing considerably better than AM, although the PBIT margins for French-language FM declined annually from a high of 20.1% in 2000 to a low of 15.7% in 2005. English-language FM PBIT margins basically remained steady, fluctuating within the 26% to 28% range and closing at a high of 28.2% in 2005.
22. Contrary to English- and French-language AM/FM performance, ethnic AM radio is doing noticeably better than ethnic FM radio. The PBIT margins for AM and FM ethnic stations are up by 5 and 2.9 percentage points, respectively.

c) Transition to digital radio

23. As of 1 October 2006, the Commission has authorised 76 transitional digital radio programming undertakings. Of these, 57 are authorised to operate in association with existing commercial radio stations, 18 are authorised to operate in association with existing Canadian Broadcasting Corporation (CBC) radio stations, and one is authorised to operate as a stand-alone ethnic radio station. The table below sets out, by location, the number of transitional digital radio stations that have been approved by the Commission.

Table 6 Markets in Canada⁽¹⁾ with transitional digital radio stations⁽²⁾

Market/Province	Commercial			CBC English		CBC French		Total
	English	French	Ethnic	Radio One	Radio Two	Première chaîne	Espace musique	
Montréal	2	6	-	1	1	1	1	12
Ottawa/Gatineau	8	3	-	1	1	1	1	15
Toronto	17	-	7	1	1	1	1	28
Vancouver	9	-	-	1	1	1	1	13
Victoria	2	-	-	-	-	-	-	2
Windsor	4	-	-	1	1	-	-	6
All Canada	42	9	7	5	5	4	4	76
	58			18				

(1) Based on BBM Radio Markets

(2) Number of stations approved but not necessarily on-air

Source: CRTC Decisions

24. Digital radio's roll-out has apparently stalled. According to the CBC, consumers do not want to buy receivers until they are convinced that there is unique new content available to justify the purchase while, broadcasters have been unwilling to create the required content until there are adequate audiences to justify the programming expenditures.
25. Moreover, because digital radio has as yet to take hold while other services such as Internet audio streaming, downloading of music and subscription-based satellite radio have since come to the market, some parties in the industry are of the opinion that, it is doubtful whether digital radio, as originally conceived and planned, will become an integral part of the Canadian radio broadcasting system in the foreseeable future. Instead, the industry is considering different uses of the existing digital radio spectrum, technology and infrastructure for new and innovative multimedia mobile wireless services.

d) Other than over-the-air

26. Over the last five to ten years, consumers have been able to choose new platforms to access audio content including satellite radio, specialty audio services and pay audio, as well as unlicensed platforms such as Internet radio, podcasting and downloading of music files from the Internet. These new technologies give consumers access to a much greater variety of music, more choice in the medium they choose to access that music from, and flexibility and control over when they listen to it. The unlicensed platforms are discussed later in this report while the licensed technologies are discussed below.

i. Specialty audio services

- Specialty audio services are radio programming undertakings, other than licensed over-the-air services, that are delivered by broadcasting distribution undertakings (BDUs) and are specialised with respect to their content and target audience.

- The Commission has approved eight specialty audio services: one is regional and seven are national. Of those services, three target ethnic communities and four target Christian communities.

ii. Pay audio programming services

- In 1995, the Commission approved two national pay audio programming undertakings, namely, Galaxie and Max Trax. These services offer 30 channels of commercial-free music. Each channel is devoted to a specific type of music, including classical, contemporary Christian, jazz, rap and rock.
- Galaxie and Max Trax are distributed across Canada on a discretionary basis by the major cable distributors and by the satellite distributor, Star Choice Television Network Incorporated (Star Choice). Subscriber revenue is the only source of revenue for these services.
- The following table sets out the tuning to pay audio in Canada according to an annual survey conducted by *Media Technology Monitor* (MTM) for the CBC.

	Anglophones 18+		Francophones 18+	
	2004	2005	2004	2005
Past Month Usage	19%	21%	16%	21%

Source: MTM (CBC / Radio-Canada, page 14)

27. Because they rely on BDU distribution for delivery of their programming, the pay audio services lack the portability and convenience of wireless services and would face significant challenges in the future if satellite subscription radio (SSR) programming services sought to expand their reach through new channels, such as mobile wireless services. In addition, if the SSR programming services were successful in obtaining carriage on BDUs, they would certainly provide direct competition to pay audio for its target audience.
28. The CBC predicts that the pay audio service providers may need to partner with wireless operators in the future in order to provide their niche-type programming over the latter's wireless networks and retain their subscribers in a "mobile" world.

iii. Satellite subscription radio programming undertakings

- The programming of Canadian Satellite Radio Inc. (CSR) and SIRIUS Canada Inc. (Sirius) is distributed primarily by satellite, with terrestrial transmitters as required to fill the gaps in coverage. Each of these North American satellite-based services provides a mix of Canadian and non-Canadian produced channels. CSR and Sirius services were launched in December 2005. As of 31 August 2006, CSR reported that it had 120,000 subscribers, and as of 22 November 2006, Sirius reported that it had over 200,000 subscribers.

- The programming of a third authorised service, an undertaking to be operated by CHUM Limited (CHUM), will be delivered entirely by terrestrial transmitters and all channels will be Canadian-produced. At the time of the writing of this report, CHUM had not yet launched this service.
- Currently, satellite radio's primary target market is the automobile. CSR and Sirius have concluded agreements with various Canadian automotive partners to have satellite radios installed in their vehicles. The latest figures in the press indicate that GM installed 50,000 units in its vehicles in 2005 and expects to install an equal number in 2006. Sirius anticipates that, by the end of 2007, there will be more than 150 vehicle models available with Sirius radios installed at the factory or dealer level. Both CSR and Sirius are also actively seeking to expand their market through carriage on cable, direct-to-home (DTH) and mobile wireless carriers. As noted above, such carriage would put SSR in direct competition with pay audio.

2. Video

a) Licensed television services

29. The number of each type of licensed Canadian television service, as of 21 November 2006, is set out in the following table. The numbers in brackets indicate the number of each corresponding undertaking in the 2002 broadcast year.

Table 8 Diversity of television services available in Canada

	English language ⁽¹⁾	French language	Third language	Total
Canadian conventional (over-the-air) (2)				
National public broadcaster (CBC)				
- Owned and operated	15 (15)	8 (8)	-	23 (23)
- Transitional digital (3)	4 (-)	4 (-)	-	8 (-)
Private commercial (4)	77 (60)	23 (18)	4 (3)	104 (81)
Religious	5 (5)	- (-)	-	5 (5)
Educational	4 (4)	3 (3)	-	7 (7)
Aboriginal	9 (10)	- (-)	-	9 (10)
Transitional digital (3)	10 (-)	3 (-)	2 (-)	15 (14)
Canadian specialty, pay, pay-per-view (PPV) and video-on-demand (VOD)				
Analog specialty services	30 (30)	14 (16)	5 (5)	49 (51)
Category 1 digital specialty services (5)	15 (16)	3 (-)	-	18 (19)
Category 2 digital specialty services (5)	49 (31)	3 (-)	26 (10)	78 (41)
Pay television services (6)	5 (6)	2 (1)	5 (-)	12 (7)
PPV services (direct-to-home (DTH) and terrestrial) (6)	9 (10)	2 (2)	- (1)	11 (13)
VOD services (6)	14 (3)	- (1)	-	14 (4)
Other Canadian services				
Community channels (7)	133 (197)	33 (47)	-	166 (244)
Community programming services	11 (-)	1 (-)	-	12 (12)
House of Commons – Cable Public Affairs Channel (CPAC)	1 (1)	1 (1)	-	2 (2)

Table 8 Diversity of television services available in Canada

	English language ⁽¹⁾	French language	Third language	Total
Non-Canadian services (8)				
Non-Canadian satellite services authorised for distribution in Canada	83 (77)	6 (8)	45 (8)	134 (93)
Total number of television services	474 (484)	106 (109)	87 (27)	667 (603)

Excludes rebroadcasters and exempt television services. Also excludes some network licences.

(1) Includes bilingual (English and French) and native services.

(2) Includes satellite to cable services.

(3) Number of over-the-air transitional digital television approved as of 21 November 2006.

(4) Excludes private commercial religious stations.

(5) Includes only Category 1 & 2 services launched prior to 3 May 2006.

(6) Number of services licensed as of 21 November 2006.

(7) Excludes class 2 and 3 exempted BDUs.

(8) Carriage of authorised services is at the discretion of the BDU.

Sources: CRTC APP 1205 report dated 21 November 2006, CRTC Decisions and CRTC Financial database system as of 31 August 2005

30. Currently:

- There are 49 licensed analog specialty programming undertakings: 28 English-language, 14 French-language, five third-language and two bilingual (English- and French-language).
- The Commission has authorised 18 Category 1 digital specialty programming undertakings: 15 English-language services have been in service since Fall 2001 and three French-language services were launched in Fall 2004.
- The analog and Category 1 services were authorised on a one-per-genre basis and have genre protection against other analog and Category 1 services as well as all Category 2 specialty services.
- Over 200 Category 2 specialty programming undertakings had authorization for operation, as of May 2006, including 105 English-language, 13 French-language, 75 ethnic or third-language and eight bilingual (English- and French-language). Approximately 75 of these services have launched: 47 English-language, three French-language and 25 third-language.
- Category 2 services do not have access rights or genre protection.
- The Commission has authorised five English-language and one French-language pay television programming undertakings. In May 2006, the Commission authorised a new national English-language general interest pay television programming undertaking. The Commission has also authorised 24 digital Category 2 pay television programming undertakings.

- There are five terrestrial pay-per-view (PPV) services: three English-language, one French-language and one bilingual (English- and French-language).
- There are six DTH PPV services: four English-language, one French-language and one bilingual (English and French).
- As of May 2006, there were 13 authorized video-on-demand (VOD) programming undertakings.

b. Financial data

Table 9 Revenues of English-language and French-language private conventional television and pay, pay-per-view & specialty services, by language (\$ 000,000)

	2000	2001	2002	2003	2004	2005
English-language						
Private Conventional	1,519	1,538	1,515	1,684	1,693	1,764
Pay, PPV and Specialty - Analog	1,006	1,183	1,312	1,399	1,521	1,618
Pay, PPV and Specialty - Digital			48	100	116	143
Pay, PPV and Specialty - Total	1,006	1,183	1,360	1,499	1,637	1,761
French-language						
Private Conventional	361	366	378	409	422	434
Pay, PPV and Specialty - Total	230	272	301	338	363	366
Ethnic & Third-language						
Pay, PPV and Specialty - Analog	34	36	40	42	48	50
Pay, PPV and Specialty - Digital			1	2	3	7
Pay, PPV and Specialty - Total	34	36	41	44	51	57

Note: English-language private conventional television includes revenues from ethnic conventional television stations as a significant portion of their revenues are derived from English-language programs.

Note: Bilingual services are combined with English-language pay, PPV and specialty services.

Source: Charts 3.12, 3.15 and 3.18 from the 2006 Broadcasting Policy Monitoring Report

31. From the Statistic Canada financial and operational annual returns (the annual returns) that licensees file with the Commission, and the Commission's financial database:
- Total revenues for private conventional television stations increased 16.1% from 2000 to 2005 for an average increase of approximately 3% per year. National advertising revenues accounted for almost the entire increase as they rose by 18% while local revenues went up by only 0.3%. Of the total advertising revenues, national advertising's share rose 3 percentage points to 81% while local advertising's share fell 3 percentage points to 19%.
 - English-language private conventional television revenues rose by 16.1% over the period while French-language revenues increased by 20.2%.

- Large private conventional television ownership groups continue to account for approximately 95% of the total revenues reported by private English-language conventional television stations. This percentage has remained roughly the same since 1998.
- Quebecor inc. (Quebecor) and Cogeco Inc. (Cogeco) accounted for 92% of the total revenues reported by private French-language conventional television in 2005.
- Specialty services' revenues rose by 72% between 2000 and 2005, for an average annual increase of approximately 12% per year.
- Specialty services have a revenue stream from both advertising and subscriptions. In 2000, subscriber revenues contributed 63% of total revenues while 37% came from advertising. By 2005, subscriber revenues declined to 57% of the total while advertising revenues increased to 43%.
- In 2005, 44% of the English-language and 36% of the French-language services' revenues were derived from advertising revenues.
- The shift toward increased advertising revenues for specialty services is consistent with the decline in viewing to conventional television and the increase in viewing to specialty services, as discussed in the next section of this report.
- Pay and PPV services rely entirely on subscription revenues, which rose by 78% between 2000 and 2005, due to increased viewing to these services.

Table 10 Aggregate PBIT¹ margins of English-language and French-language private conventional television & pay, pay-per-view and analog specialty services

	2000	2001	2002	2003	2004	2005
English-language						
Private Conventional	14%	13%	9%	14%	11%	11%
Pay, PPV and Specialty - Analog	18%	19%	21%	21%	25%	31%
French-language						
Private Conventional	12%	10%	11%	14%	12%	11%
Pay, PPV and Specialty - Analog	17%	16%	17%	21%	21%	25%
Ethnic & Third-language						
Pay, PPV and Specialty - Analog	16%	14%	17%	17%	26%	24%

Note: English-language private conventional television includes ethnic conventional television stations, as a significant portion of their revenues are derived from English-language programming.

Note: Bilingual services are combined with English-language pay, PPV and specialty services.

Source: Charts 3.14, 3.17 and 3.19 from the 2006 Broadcasting Policy Monitoring Report

¹ Profit before interest and taxes (PBIT)

32. From the annual returns that licensees file with the Commission, and the Commission's database:

- Both English- and French-language private conventional television PBIT margins declined from 2000 to 2005, due in part to the shift in advertising revenues to specialty services.
- In comparison, specialty services' PBIT margin increased from 18.5% in 2000 to 24.8% in 2005. Over this period, analog services' PBIT increased from 18.5% to 30.2%. Category 1 and Category 2 services first reported in 2002 and are still reporting negative margins.
- Pay and PPV services reported a PBIT margin of 12.3% in 2000, increasing to 27.3% in 2005.
- From a language perspective, English- and French-language pay and specialty services reported PBIT margins of 25.8% and 23.3%, respectively, in 2005.
- Ethnic pay and specialty services reported PBIT margins of 20.2% in 2005, compared to 11% in 2000.

c) Transition to digital over-the-air television

33. In *A licensing policy to oversee the transition from analog to digital, over-the-air television broadcasting*, Broadcasting Public Notice CRTC 2002-31, 12 June 2002 (Public Notice 2002-31), the Commission set out a policy framework to oversee the transition of analog over-the-air television services to digital television (DTV) services. The policy framework is based on a voluntary, market-driven transition model, without mandated deadlines.

34. Transitional DTV licensees are allowed to broadcast a maximum of 14 hours per week of high definition (HD) programming that is not duplicated on the analog version of the service. A minimum of 50% of this unduplicated HD programming must be Canadian and all of the unduplicated programming must be in HD television (HDTV) format. In Public Notice 2002-31, the Commission encouraged transitional DTV licensees to ensure that two-thirds of their schedules would be available in HDTV format by 31 December 2007.

35. In *The regulatory framework for the distribution of digital television signals*, Broadcasting Public Notice CRTC 2003-61, 11 November 2003 (Public Notice 2003-61), the Commission determined that a cable BDU may apply to be relieved of the obligation to distribute analog signals, once 85% of its subscribers have the ability to receive digital services by means of DTV receivers or set-top boxes.

36. Currently, 22 originating television stations and four rebroadcasters are authorised to operate transitional DTV undertakings. The following table lists the transitional DTV undertakings that have been approved, although not all are implemented.

Table 11 Over-the-air transitional digital television⁽¹⁾

Market	Language	Source station		Actual or planned start date
Montréal	F	CFJP	TQS	-
	F	CBFT	SRC	March 2005
	F	CIVM	Télé-Québec (<i>educational and cultural service</i>)	September 2007
	F	CFTM	TVA	-
	E	CBMT	CBC	March 2005
Québec	F	CBVT	SRC	January 2006
Ottawa	F	CBOFT	SRC	September 2006
	E	CBOT	CBC	September 2006
	R	O/E	OMNI 1 <i>Rogers (ethnic station)</i>	July 2007
	R	O/E	OMNI 2 <i>Rogers (ethnic station)</i>	July 2007
Toronto	F	CBLFT	SRC	March 2005
	R	F	CBOFT <i>SRC (Ottawa station)</i>	September 2006
	E	CBLT	CBC	March 2005
	E	CFTO	CTV	July 2005
	E	CIII	Global	November 2004
	E	CITS	<i>Crossroads (religious programming)</i>	-
	E	CITY	CHUM	January 2003
	E	CKXT	Quebecor	February 2004
	O/E	OMNI 1	<i>Rogers (ethnic station)</i>	October 2006
	O/E	OMNI 2	<i>Rogers (ethnic station)</i>	October 2006
Hamilton	E	CHCH	Global	-
	R	E	CKXT <i>Quebecor</i>	February 2004
Vancouver	E	CBUT	CBC	January 2006
	E	CHAN	Global	-
	E	CIVT	CTV	July 2005
	O/E	CHNM	<i>Multivan (ethnic station)</i>	-

(1) Number of stations approved but not necessarily in operation

E: English; F: French; O/E: Multi/English; R: Rebroadcaster

Source: CRTC APP 1205 (3 May 2006) and licensees

37. As part of this proceeding, Michael McEwen, Broadcast Consultant, was commissioned to provide a report on the digital transition strategies in a number of different countries (the “McEwen Report”). In relation to Canada’s transition, Mr. McEwen concludes that:

- Canada's market place approach to the roll out of digital services, and the broadcasting industry's decision that a two-year lag behind the US roll out would save a great deal in the early adoption cost for broadcast, production and consumer equipment, has had some benefits for Canada. Canada has however fallen further and further behind the US and the two-year lag has turned into at least four years and maybe more.
- As the US and other countries focus on analog shutdown as early as 2009 through to 2012, Canada has only transmitted limited digital over-the-air services in Toronto, Montréal and Vancouver, with Ottawa and Québec due for CBC/SRC service this year. Canada's pay and specialty services have made modest beginnings with HD services but nothing in terms of the volume of their US counterparts.
- One of the reasons for this slow roll out is that, as broadcasters have said repeatedly, they do not see the value of building out digital transmission facilities across the country and going through the expense of simultaneous carriage of analog and digital systems, particularly when most of the markets are delivered by cable and to a lesser extent satellite. The CBC seems willing to build out digital transmitted service, but only if it is given additional funding for full coverage. The private sector would probably agree with that view if it applied to them.
- Commissioning of prime time drama programs, made for TV-movies, and, in particular, the production of sporting events has increased a great deal over the last two years and there is a visible effect on the screen. The challenge is to make a definable viewing experience for Canadian HD in the sea of US product ever the Canadian challenge.
- While Canada is challenged by the media colossus to the south, it does have a regulatory framework that protects Canadian broadcasters from competing foreign digital services. This situation may be a disincentive for broadcasters to embrace the digital transition compared to the other countries reviewed in this paper. There also is not the same kind of spectrum challenge in Canada as found in Europe or the same pressing need for analog broadcast spectrum for other services (although this latter point is now being challenged by service providers interested in supplying mobile and convergent services). In short, Canada has not had the same kind of market pressure as other countries to make the transition to digital, whether HD or not, in an efficient and effective manner.

- Digital HD displays have had a take-up in Canada similar to that of the US. Close to three million displays will have been sold in Canada by the end of 2006 with growth trends in sales similar to the US. Projected through to 2011, Canadian households should all have HD displays – many of them with built-in over-the-air tuners and the cable plug-and-play capacity (currently not available from cable providers). However, hook ups to available HD services have been slow with only about 400,000 HD hook ups to cable and satellite with virtually no over-the-air viewing. This will change gradually as consumers understand what is available and how to get it. The availability of more Canadian services and better promotion by the broadcast community will drive consumers to these new services. As in the US, there is a hook up lag, and for the most part the better wide screen picture as displayed by digital video discs (DVDs) have pushed the market along.

d) High Definition Television

38. In *Regulatory framework for the licensing and distribution of high definition pay and specialty services*, Broadcasting Public Notice CRTC 2006-74, 15 June 2006 (Public Notice 2006-74), the Commission announced its regulatory framework for the licensing and distribution of HD pay and specialty services. As of May 2006, the Commission has approved licence amendments for four analog specialty, two pay and ten Category 2 specialty services, authorizing their distribution in the HD format. It is estimated that, as of Spring 2006, there were at least 321,393 subscribers to discretionary HD services² in Canada.
39. The following tables indicate the number of HD services currently available from Canadian BDUs and the average hours of Canadian HD programming they offer in each week.

Table 12 Number of high definition services offered by BDUs

	Canadian services	Foreign services	Total
Cogeco	10	9	19
Rogers	16	10	26
Shaw	5	5	10
Videotron	8	5	13
Bell ExpressVu	16	11	27
Star Choice	6	8	14

Source: Table 3.12 from the 2006 Broadcasting Policy Monitoring Report

² Source: Licensees with 20,000 subscribers or more. This figure excludes viewers to HD services carried on basic pursuant to section 17 of the *Broadcasting Distribution Regulations* (the Regulations) for cable BDUs and to section 37 of the Regulations for DTH BDUs as well as those viewing HD programming received directly over-the-air. The figure also excludes all discretionary subscribers of cable BDUs with less than 20,000 subscribers because these cable BDUs are not required to report such information.

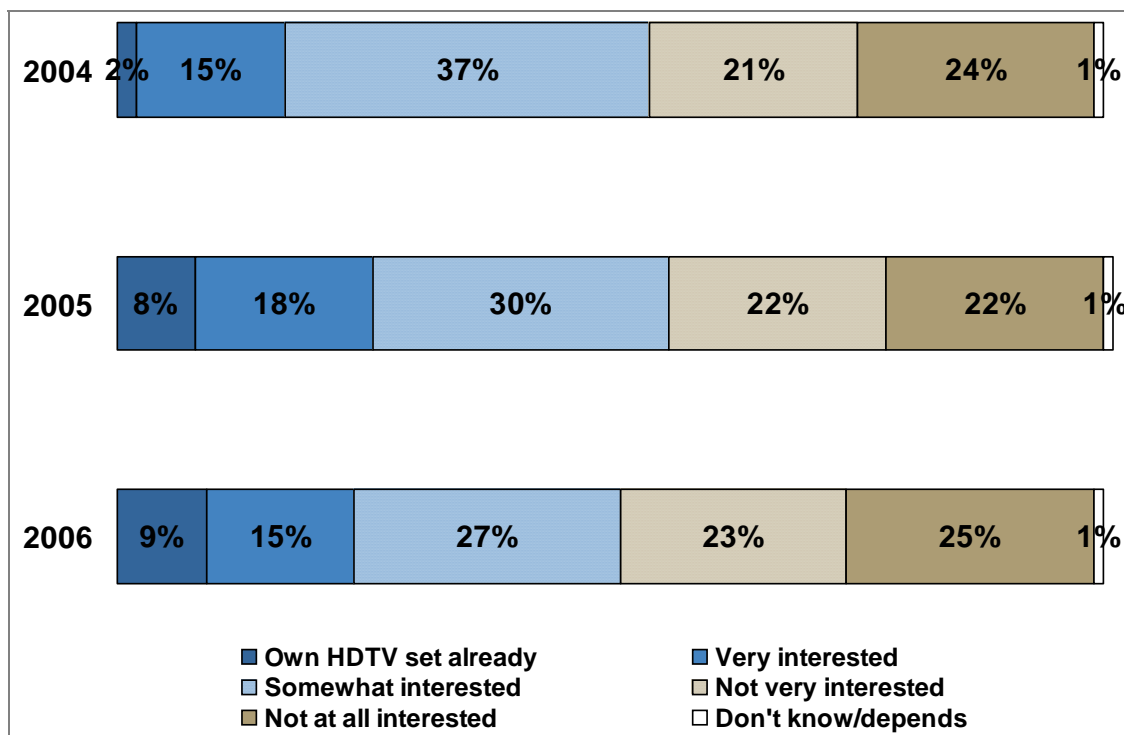
Table 13 High definition offering of Canadian programming

	Weekly average of HD hours	Original
Conventional television		
CBC	8.25	100%
CHUM	11.5	17%
CTV	2.3	57%
Global	10	55%
SRC	6	100%
Pay and specialty services		
Discovery HD	75	0%
Movie Central	42	7%
Movie Pix	11	9%
Raptors	25	100%
TMN	53	4%
TSN	10	60%

Source: Table 3.13 from the 2006 Broadcasting Policy Monitoring Report

40. As noted in the Introduction, the Commission commissioned Solutions Research to Group (SRG) to provide a trend analysis on the topics raised by the OIC. With respect of HDTV services, SRG canvassed Canadians' interest in HDTV. The findings in the SRG report are set out below.

Chart 1 - Interest in HDTV



Source: Page 21, Fast Forward™ Trend Analysis prepared by Solutions Research Group for CRTC – August 2006

- Based on its data, SRG concluded that HDTV growth levels in Canada have underperformed in the past two years, primarily due to the following factors:
 - until just recently, persistently high price points;
 - consumer confusion about HD's features and benefits;
 - lack of programming; and
 - lack of clear and consistent communication by the consumer electronics and television industries.

- SRG also found that:
 - One-in-ten Canadian households, or just over 1.2 million households, currently have an HD-capable television. Other studies have suggested slightly higher penetration rates, in the 14% to 15% range.
 - The typical primary television in the Canadian household is about six years old. Just under one-in-ten primary televisions are replaced annually in Canada. SRG anticipated that 40% to 45% of primary televisions in Canadian households will be HD-capable by 2011. It is important to note, however, that this number does not include secondary HD displays such as new personal computer (PC) and laptop screens that are capable of displaying HD content.

41. High Fidelity HDTV Inc. (High Fidelity), an independent Canadian broadcaster and content producer, concurred that HD penetration in Canada has stalled between television ownership (17%) and HD distribution (3%). In High Fidelity's view, however, the mandate of the US Federal Communications Commission (FCC) will drive the HDTV shift in Canada. Accordingly, HDTV unit sales for Canada are forecast to increase in the coming years. High Fidelity projected that the number of Canadian households with HDTV sets will rise to 22.6% in 2006, 31% in 2007, 40.6% in 2008, 51.7% in 2009 and 63.5% in 2010.

42. The Canadian Association of Broadcasters' (CAB) research indicated that while HDTV television ownership has reached 15% of Anglophones and 9% of Francophones overall, a minority of these televisions are actually connected to a source of HDTV programming such as a digital set-top box. As a result, only about 6% of Anglophones and just over 2% of Francophones are capable of receiving and viewing HDTV programming.

e) Distribution technologies

43. There are four broadcast distribution technologies available for television programming: conventional over-the-air (OTA) transmission, cable distribution, DTH satellite distribution and Internet Protocol Television (IPTV).
44. All DTH subscribers receive digital signals whereas cable subscribers may receive either analog or digital signals, or a combination of the two. While a significant portion of cable subscribers continue to rely on analog service, the shift to digital cable has accelerated significantly in recent years and is expected to continue to grow rapidly as analog cable subscribers recognize the benefits of digital service. The CBC predicts almost four of five Canadian households will subscribe to some form of DTV distribution service by 2010.
45. From the annual returns that licensees file with the Commission:
 - The BDU industry as a whole continued to grow as total revenues in 2005 increased by 0.4%, from 2004 to \$4.575 billion (7.5% average annual growth rate, 2001-2005).
 - DTH, multipoint distribution system (MDS) and subscription television (STV) providers reported increased revenues of 8.1% in 2005.
 - Class 1 BDUs' PBIT margins decreased slightly from 23.2% in 2004 to 20.3% in 2005, but still up from 15.2%, 15.4% and 17.5% reported in 2001, 2002 and 2003 respectively.
 - Correspondingly, the industry's return on net fixed assets declined from 20.4% in 2004 to 14.4% in 2005 on account of a significant increase in capital expenditures. This 14.4% is comparable to the 14.2% the industry reported in 2003, and up from the 11.3% and 11.5% reported in 2001 and 2002 respectively.

i. Over-the-air (OTA)

46. SRG estimated that, of the just over 12 million households in Canada in 2006:
 - 44% were "digital homes" (20% subscribed to digital cable and 24% subscribed to DTH, which offers only digital service);
 - 43% subscribe to analog cable; and
 - 13% do not subscribe to cable or DTH.
47. SRG's figure of 13% is higher than the figure contained in the report entitled *A Review of research data on the Canadian television industry*, prepared by the Canadian Media Research Inc. (CMRI) and included in the submission by Bell Canada (Bell), MTS Allstream Inc. (Allstream), Saskatchewan Telecommunications (SaskTel) and TELUS Communications Inc. (TELUS). The CMRI report indicated that the combined penetration of cable and DTH was 89.8% in 2005, meaning that only 10.2% of

Canadians depend on OTA reception for their television programming. In 2000, the number that depended on OTA reception was 16.4%. In comparison, according to the annual returns filed with the Commission by BDUs, two million of the 12 million Canadians (16%) receive their television signals OTA (see table 14 below) while Nielsen Media Research (Nielsen) reports that approximately 13% receive their signals OTA. Given these differences in estimates, it would appear that anywhere between 10% and 16% of Canadians receive their television signals OTA. What is key however is that the percentage is declining.

48. As part of its ongoing initiative to implement more efficient network technologies, the Aboriginal Peoples Television Network (APTN) engaged Environics Research Groups to canvas participants in APTN's annual *North of 60°* study regarding their preferred method for receiving their broadcast services. The results of the 2006 survey, which was conducted in May and June of that year, showed that 48% of respondents preferred satellite, 25% preferred analog cable and 13% preferred digital cable. Only 6% of respondents with televisions indicated OTA as their preferred method for receiving television programming.

ii. Cable distribution

49. According to the annual returns filed with the Commission by BDUs, over 10 million of the approximately 12 million Canadian households receive their television signals from a licensed BDU, either a cable undertaking or a satellite DTH undertaking. The two million or so remaining households receive their television signals either from OTA television undertakings or from non-Canadian black and grey market satellite services.

Table 14 Number of basic subscribers (000)

	Cable, class 1 ⁽¹⁾		DTH		MDS & STV		Total	
2001	6,857	81.0%	1,520	18.0%	87	1.0%	8,465	100%
2005	6,617	72.4%	2,486	27.2%	32	0.4%	9,135	100%

(1) Class 1 cable BDUs include Digital Subscriber Line (DSL) results. As part of the Commission's streamlining process, a few Class 1 cable systems have been exempted from reporting requirements. Total results also exclude the approximately one million cable subscribers of systems, other than Class 1s, that are not required to report their results to the Commission ie. exempt cable systems.

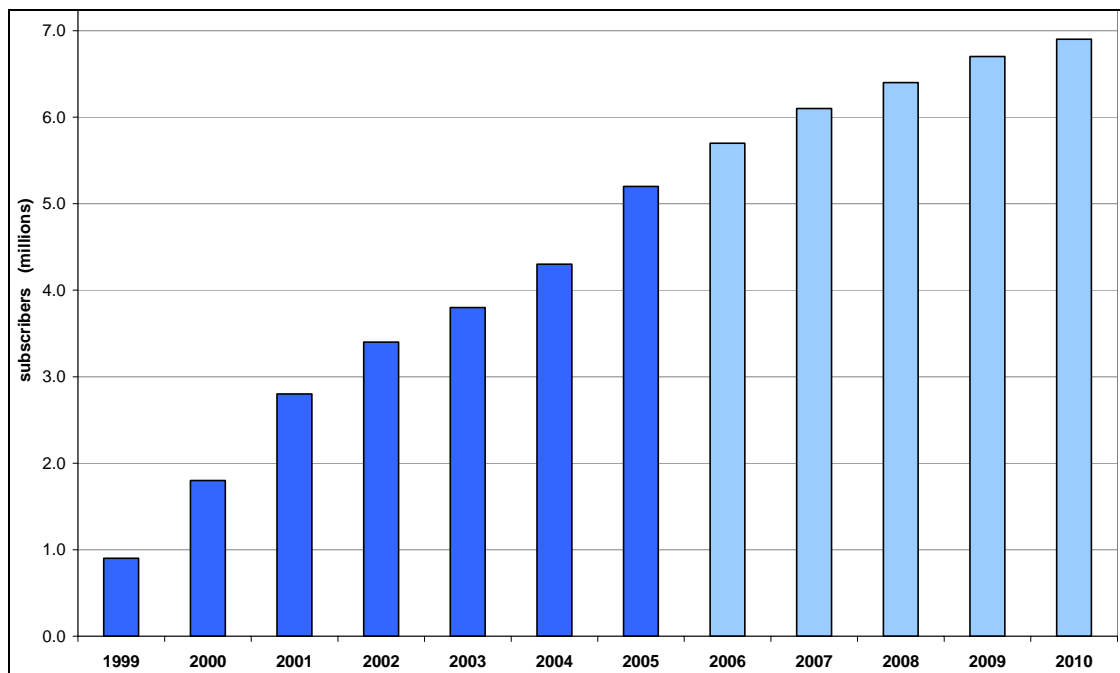
Source: CRTC financial database

- Competition, primarily from DTH, has reduced Class 1 cable licensees' overall share of subscribers, from 81% in 2001 to 73% in 2005.
- Statistics Canada figures for 2005 indicate that there were a total of 7.6 million cable subscribers in that year including approximately one million subscribers to cable systems that the Commission considers exempt.

50. According to Rogers Cable Communications Inc. (Rogers), the shift from analog to digital technology has been one of the most significant changes for distribution networks. Most cable operators have launched digital services and are near completing their transition to an all-digital platform. DTH providers have always offered all-digital services as have telephone companies. Also according to Rogers:

- The approximately 5.3 million subscribers to digital cable and DTH in the second quarter of 2006 are expected to reach 6.9 million by 2010.
- Cable distributors have invested more than \$7.5 billion since 2000 to upgrade their networks to digital, switched, and two-way capable. Digital cable services are available to all households in the service areas of the four largest cable companies, or to more than 10.5 million households.
- Cable operators are aggressively encouraging their customers to upgrade to digital so that the operator can reclaim the bandwidth consumed by analog television channels. While each cable operator's plans will be different, it is likely that analog cable could be phased out by as early as 2010 and almost four in five Canadian households will be subscribing to some form of d DTV distribution service by that time.

Chart 2 - Digital subscribers in Canada



Source: p. 19 of Rogers' submission

51. In its submission, the Ontario Media Development Corporation (OMDC) stated that Pricewaterhouse Coopers (PWC) predicts there will be 9.3 million digital households by 2010, representing nearly three-quarters of all Canadian households that have televisions.
52. Quebecor stated that, in 2006, nearly one-half of Videotron Ltd.'s (Videotron) subscribers will be served by digital and nearly 70% will have a digital terminal in their home within three years. Televisions will incorporate a digital terminal and a cable modem will permit the Internet to be provided by the distributor's private network, resulting in the convergence of television and computer screens.
53. SRG's research suggested that most of the consumers who have the greatest interest in digital television have already switched. Accordingly, SRG is projecting that the combined penetration rate of Canadian households by digital cable and DTH will reach a ceiling of 58% to 60% by 2011.
54. The CAB's research indicated that, while 90% of Anglophones and 83% of Francophones subscribe to a licensed BDU, those who subscribe to a digital BDU service are still in the minority. Specifically, 44% of Anglophones and 42% of Francophones subscribe to digital cable or DTH, while the other digital service providers (telecommunications distributors and "wireless" cable) serve less than 1% each. Thus a majority of Canadian consumers continue to rely on analog BDU and OTA reception.

iii. Direct-to-home distribution (DTH)

55. There are two licensed DTH service providers: Bell ExpressVu Limited Partnership (ExpressVu) and Star Choice.
 - DTH is a one-way only platform and does not currently support VOD services.
 - Subscribers to DTH increased by 178,000 in 2005, representing an increase of 7.8% for a total market share of 27.0%.
 - ExpressVu offers more than 400 channels of programming, including over 20 true HD services. Star Choice reports offering 17 true HD services.
 - ExpressVu and Star Choice reported combined total revenues of approximately \$1.4 billion and some 2.5 million subscribers in 2005.
56. With HDTV's increasing popularity, ExpressVu has been testing and investing in a new transport modulation scheme to accommodate the need for more new, true HD signals. According to ExpressVu, however, this testings' results show that, even with the limited deployment of these techniques on satellite transponders used only for HD, there will still be a need for more satellite capacity to accommodate Canadian broadcasters' transition to HD.

57. ExpressVu also noted that, in June 2006, the Department of Industry (the Department) issued a call for applications for new satellites to employ as-yet unused frequencies at the orbital locations used by both ExpressVu and Star Choice and by Canadian Satellite Communications Inc.'s satellite relay distribution undertaking. One new satellite has an estimated capacity for as many as 150 true HD channels. According to ExpressVu, however, the business risk associated with satellites is high given the significant operating and capital costs of deploying this technology. ExpressVu also submitted that it is unclear when satellite capacity will be required, and whether the HD services will generate sufficient incremental revenue to provide an appropriate financial return. ExpressVu added that the \$300 million cost of each new single-frequency-band satellite must be amortized over its life of about 12 years.
58. The Communications Research Centre (CRC) also referred to the Department's call for applications for 29 satellite licences, of which ten would be for new broadcasting satellite services. The CRC submitted that these satellite licences would provide an impressive increase in Canadian capacity, which could respond to the need for more local television and HDTV programming. The CRC further noted the trend to offer mobile, fixed and broadcast satellite services by satellite in various frequency bands as the technology evolves. The CRC maintained that any review or development of regulatory regimes and policies should take this trend into account.

iv. Internet Protocol Television (IPTV)

59. In their respective submissions, Bell and Rogers addressed the current state of IP / Digital subscriber line (DSL) technology for broadcasting distribution:
- IPTV is a relatively recent innovation in broadcasting distribution technology. Multimedia Research Group Inc. (MRG) predicts worldwide IPTV subscriber penetration to increase from 3.7 million in 2005 to 36.9 million by 2009, with global IPTV service revenues rising from \$880 million in 2005 to \$9.9 billion in 2009.³ Europe and Asia are leading the implementation of IPTV at this time, with North America close in third place.
 - Bell obtained a licence to operate regional Class 1 terrestrial BDUs in Ontario and Quebec in 2004. Since that time, Bell has been developing its terrestrial network to allow for the delivery of audio-visual programming using IP over a DSL platform.⁴

³ *IPTV Global Forecast – 2005 to 2009*: September 2005, Multimedia Research Group Inc., September 2005, Executive Overview.

⁴ In 2005, Bell assumed the facilities and customer base of a small, hybrid analog/digital BDU operating in parts of Montréal and using a traditional hybrid fibre-coax distribution system. Bell will not report on this technology, as the cable operators are likely to provide comprehensive information about such a platform.

- As of this writing, Bell Aliant (Aliant), Bell, SaskTel and TELUS are licensed as Class 1 BDUs to provide IPTV service using DSL technology. In August 2006, Allstream announced that it had begun to offer subscribers seven HD channels. Allstream reported that its BDU service is now available to more than 93% of homes in Winnipeg.⁵ SaskTel offers 27 HD channels. Bell's IPTV service is expected to be available to approximately 4.2 million households by 2008.⁶ It is estimated that, as of 2005, there were approximately 100,000 subscribers to IPTV services in Canada. This is higher than the 77,000 subscribers forecast referred to by The Canadian Coalition of Audio Visual Unions (CCAUI). The number of Canadian subscribers is forecast to increase to more than 800,000 by 2010.⁷ As a comparison, Verizon, a telephone company in the US, offers up to 25 HD channels over its fibre optical video distribution network.
- The evolution of IPTV will occur in an expanded broadcasting context that features conventional and on-demand HD content being delivered to a multiplicity of receiving devices at any time and any place.
- This new broadcasting context will likely feature IPTV as just one of many applications covered by an umbrella brand for all of the services provided by a telco over its broadband network. Consumers are well-accustomed to "pulling" content from the Internet as their needs and wants warrant. This growing willingness, indeed preference, to control the scheduling of content consumption will ultimately translate into a critical mass of television subscribers who will increasingly welcome and exploit the interactivity of IPTV. In the future,

more flexibility and more applications are sure to come, from more suppliers. But a day is coming when the capabilities we call IPTV today become a feature-set of something bigger and hopefully, able to fulfill the broader needs of subscribers and service providers alike.⁸
- It is clear that the network model of tomorrow will be consumer-centric in its ability to deliver personalized services:

Whether it is channel programming, language selection, presentation customization, automating content selection for "my-channel" delivery, mixing personal content for delivery in a close community, or gaming or sharing within groups, these services illustrate the key

⁵ Allstream financial report for the second quarter of 2006; 27 July 2006

⁶ As reported in Cartt newsletter, 31 January 2006; available at www.cartrt.ca

⁷ RBC Capital Markets, *North American Telecom Services*, July 2006

⁸ "What comes after IPTV?", Steve Hawley, *Telephony Online*, 14 June 2005

benefits of IPTV: interactivity and communications capabilities available through the NGN (Next Generation Network) application plane. IPTV would benefit from open application-level standards for content management, application creation, and user control of their IPTV experience.⁹

- These personalized services will undoubtedly terminate on not only set-top boxes, which will characterize the initial IPTV implementation, but also other terminals such as cell phones, personal digital assistants (PDA), portable media players such as iPods, and gaming devices such as PlayStation and Xbox.
- IPTV will benefit the broadcasting system by facilitating competition in multiple dwelling units, residents of which are not always able to avail themselves of a competitive service because of line-of-sight constraints. It will also allow BDUs and programmers to work together on innovative, more effective targeted advertising.¹⁰ As well, IPTV technology may evolve to marry traditional linear services with the content available on the Internet on the same receiving apparatus (subject to viable business models and developing the technology and operating system support Operation Support System (OSS) to support it).

f) On-demand technologies

i. Video-on-demand (VOD)

60. VOD is similar to PPV but differs in that subscribers choose their selections from a content library as opposed to a broadcasting schedule. The selection is played at the time of the subscriber's choosing rather than being broadcast according to a predetermined schedule.
61. According to the OMDC, digital cable's increased penetration has also led to an increase in VOD's popularity. OMDC stated that the percentage of digital cable subscribers that use VOD has grown from less than 10% in 2002 to nearly 36% in 2005, and that these subscribers spent \$83 million on VOD services. Based on these take-up rates and the experience of video cassette recorder (VCR) and DVD penetration, PWC predicts that total VOD spending will reach \$356 million by 2010, representing 61% of digital cable households.
62. Rogers reported that approximately 50% of its digital cable subscribers use VOD at some time each month.

⁹ ATIS IPTV Exploratory Group Report and Recommendation to the TOPS Council, July 2005, p. 13.

¹⁰ In order for BDUs to implement this, a revision to section 7 of the *Regulations* will be required.

63. In its research, SRG noted that:

- 44% of digital cable households, or 9% of Canadian households, used paid or free VOD at least once in 2006, up from 36% in 2005; and
- on-demand use via the cable or DTH platform will increase in the next five years to approximately 30% of all Canadian households. This growth will occur gradually, year-by-year, and will not be similar to the explosive growth in DVD penetration or Internet use over the last five to six years.

ii. Personal video recorders (PVRs)

64. Personal video recorders (PVRs), or digital video recorders as they are also known, record video content in a digitized format to a hard disk storage medium such as a PC's hard disk. PVRs perform many of the same functions as a VCR but have a number of advantages over them, including the following:

- automatic recording of live programming at the time it is being watched. This feature allows the viewer to pause or rewind live programming at any time. Once viewing resumes, the fast forward button can be used to catch up to the live version by skipping through commercials; and
- viewers of recorded programs can also skip commercials, using the fast forward command or, on some PVRs, a 30-second skip-ahead feature. The ability to skip commercials has given rise to concerns on the part of advertisers and broadcasters that the revenue model for advertiser supported television may be in jeopardy.

65. In its research, SRG found the following with regard to PVRs' penetration rate and consumer attitudes toward these devices:

- PVR penetration in Canada is behind that in the US In 2006, 6% of Canadian households, or just over 700,000 households, had a PVR, up from 4% in 2005. Eight percent (8%) of US households had a PVR in 2005.
- Interest in PVRs is high with over 50% of subscribers to digital cable or DTH expressing an interest in obtaining one in the future.
- Households with teenagers indicated the greatest interest in obtaining a PVR.

66. Submissions to this proceeding provided the following additional comments:

- Currently, an estimated three-quarter of a million Canadian households have a PVR, a relatively low amount compared to the 11 million plus households that have VCRs. However, given how rapidly VCRs became ubiquitous in Canadian households, PVRs' penetration levels should rise over time as they become more affordable.

- According to Forrester Research, Inc., the Canadian market is lagging the US market somewhat, but is expected to follow the trend in the US market, which is forecasted to achieve 45% penetration by 2009.¹¹
- Projected growth in PVR penetration is further supported by survey results indicating that PVR owners expressed high levels of satisfaction with the service and have found that it substantially improves their viewing experience. An In-Stat survey in the US found very high satisfaction levels, with 86% of users reporting that they were very or extremely satisfied with their PVR.¹² In Canada, SRG found that 62% of PVR users considered the device increased their viewing enjoyment.¹³
- According to Rogers, the forecasts and surveys indicate that a majority of consumers will acquire a PVR within the next five to seven years. With services such as VOD and PVR at their disposal, more consumers will adopt on-demand habits, creating a culture of convenience among television viewers. Consumers accustomed to on-demand convenience from the broadband platform are seeking the same convenience from their televisions. In response, television manufacturers like LG, Mitsubishi and Sony are beginning to market televisions with built-in PVRs. This behavioural change will displace viewing of linear scheduled programs on television channels, even while it stimulates overall viewing of audio-visual content on traditional media platforms. At the same time, this change will impact the traditional linear advertising model potentially causing advertisers to seek other vehicles for advertising placement.
- In its submission, Bell stated that some parties in the industry are concerned about the time-shifting opportunities offered by PVRs. Nevertheless, as Bell pointed out, PVRs are the next generation of VCRs, which have been used by cable subscribers for decades. Bell also submitted that it is generally acknowledged that digital set-top boxes incorporating a PVR will be the future norm in the industry. Because of the current niche market acceptance and the premium prices attached to these set-top boxes, PVRs currently have a relatively low penetration rate.¹⁴ According to Bell, however, the research indicates that PVRs users are generally pleased with these devices and the on-demand capability they offer. Some studies also report that PVR users increase their television viewing and are more likely to subscribe to additional optional services.

¹¹ Forrester Research, Inc., *Five Predictions for the Future of Direct Marketing*, presented by Eric Schmitt to the Direct Marketing Club of New York, 12 January 2006, at slide 25; available at:

<http://www.dmcny.org/mc/page.do?sitePagelId=25051>

¹² In-Stat survey results for the United States, as reported in a press release, 5 June 2006; available at www.instat.com

¹³ SRG, *Fast Forward™ Study*, 2006.

¹⁴ *A Review of Research Data on the Canadian Television Industry*, Canadian Media Research Inc., August 2006, p.14.

g) Other Technologies

i. Broadband Internet

67. As activities such as streaming video over the Internet or downloading audio files require more bandwidth, consumer demand for high speed broadband Internet continues to increase in Canada. The following chart compares the growth in high-speed Internet access to the decline in dial-up access over the last five years. As of 2006, 81% of homes with Internet access employed high-speed while only 19% used dial-up.

Table 15 Dial-up vs. high-speed Internet access at home

	CyberTRENDS		SRG	
	High-speed	Dial-up	High-speed	Dial-up
2001	30%	70%	-	-
2002	40%	60%	-	-
2003	50%	50%	61%	39%
2004	65%	35%	68%	32%
2005	74%	26%	79%	21%
2006	-	-	81%	19%

Sources: 2006 Broadcasting Policy Monitoring Report, CyberTRENDS, ComQUEST Research, Research Dimensions: March 2001, 2002 and 2003, and December 2004 and 2005 editions; SRG, Fast forward Trend Analysis

68. According to Rogers' research, Canada has consistently been in the lead among G7 countries for broadband penetration. Further, forecasts of Canadian households with broadband Internet suggest that, by 2010, subscriber levels could reach ten to eleven million households, equal to a penetration rate of up to 80%.

ii. Audio over the Internet

69. Audio content can currently be accessed from the Internet in basically three ways:

- **Streaming**

- Streaming is a technology that allows a consumer to view a video or listen to audio in a continuous stream as it is received over his or her PC.
- Streamed audio or video is not meant to be retained by the consumer.
- Streamed audio is like radio programming in that it is scheduled. In order to combat audience fragmentation caused by new media, many broadcasters have responded by streaming their OTA radio stations. In other cases, actual Internet-only radio stations have been created.

- According to the CBC, research indicates that about one in five Canadians listen to audio streamed over the Internet, with significantly higher percentages among youth and young adults. Internet audio streaming is also popular among Canadians with a non-North American or non-European ancestral background, presumably because they can easily access third-language audio services not otherwise available in Canada. While streaming benefits listeners by enabling them to access out-of-market stations and benefits the affected stations by enabling them to extend their coverage, it disadvantages local broadcasters by reducing their audiences.
- The CBC further noted that driven by consumer demand for the “wired home”, several technologies have been built to take advantage of wireless home networks and establish a bridge between PCs and home audio equipment. This type of interconnection enhances opportunities to listen to Internet streaming and may permit Internet-based music to play an increasingly prominent role in consumers’ listening habits both at home and at work. However, streamed audio’s sound quality is not on par with that offered by most other broadcasting services. For some listeners, this will likely limit the attractiveness of this audio option.

- **Podcasting**

- Podcasting is a form of on-demand audio delivery involving the downloading of audio files to a PC or personal audio device for subsequent listening.
- Audio files can range from quick news clips to whole radio programs complete with songs and comment.
- Files can be downloaded and played on PCs and portable devices. A common way to receive these files is to subscribe to a feed that automatically notifies customers when a new file in a series is available, sometimes even incorporating files into a user’s portable play list in an integrated interface such as Apple’s iTunes.
- Some broadcasters are currently involved in podcasting and they make significant amounts of audio programming available to the public as a complementary service via their Web sites.
- Podcasting was virtually unknown two years ago, has a low penetration rate but is increasing in popularity, especially among younger Canadians. It allows broadcasters to tap into the new technologies to reach a new, younger audience, its future generation of listeners. Podcasts are generally available free of charge, although some podcasters have begun to charge for access.

- The CBC stated that, like on-demand video services, podcasting can be considered to be indirectly competitive with traditional broadcasting. However, the CBC submitted that, given podcasting's limited commercial element, it is perhaps better viewed as a complementary service that can be used to raise the profile of a broadcaster's other audio services and lead to the development of new audiences.

Internet downloads

- Internet downloads consist of downloading music to computers or personal audio devices, generally for a fee.
- Internet downloads are a form of on-demand access that is only indirectly related to broadcasting, being more akin to purchasing a CD than listening to radio. Nonetheless, Internet downloading does represent a significant new source of audio content and, as such, competes for listening time with both conventional radio and other audio platforms.
- As with audio streaming, Internet audio downloading is popular among Canadians with a non-North American or non-European ancestral background.
- As noted earlier, SRG's survey results indicate that one-in-three Canadian Internet users actively download content. The rate more than doubles among those aged 15 to 19 years.

iii. Enabling technology

70. *Peer-to-peer* (P2P) networks are generally used for sharing files as one user links with another to enable the transfer of information and files (e.g. Napster, Limewire, MP3s, videos, images, games and other software) through the use of a common P2P client. The only requirement is that the files be digital.
71. *Place-and-time shifting* provides consumers with the ability to store and view archived or real-time content on media devices such as PCs, mobile phones or other Internet-connected devices. An example is the SlingBox, which enables a subscriber with access to a high-speed connection to access his or her digital set-top box at home from anywhere in the world to view whatever programming is available with that set-top. Consumer use of this technology will certainly become much more common as it is perfected. Currently, however, the video quality is poor because the upstream bandwidth is limited.

72. *User-generated content* allows individual consumers to become their own content producers as they create video content and distribute it over the Internet. An example is “YouTube.” According to recent reports, both American and Canadian broadcasters are supplying Web sites with programs, promos and trailers in an attempt to attract Internet “surfers” back to conventional television to view the entire program.

iv. Mobile wireless

73. All three of Canada’s largest wireless carriers have introduced wireless music options to their portfolio of subscriber services. These music services currently rely on MP3-enabled phones, which combine wireless phone communications with MP3 playback capabilities. Music can be downloaded and purchased over the wireless network in MP3 or other audio file formats.
74. According to the CBC study, the on-demand character of these mobile wireless services distinguishes them from conventional radio, as well as from new platforms such as satellite radio, which provide scheduled audio content. As with music downloading, mobile wireless music services are more like traditional music purchases than broadcasting. The availability of such services is likely to have an effect on audio broadcasting services, if only as a form of displacement.

v. Mobile television

75. Mobile television is a relatively new wireless technology that allows consumers to view real-time video over a mobile device. In explaining the technology, the CRC stated the following:
- Recent advances in broadband wireless technologies and in digital video compression have made it possible for mobile television to be provided by cellular telephone network operators. Specialised handheld devices can download pre-recorded or live audio-video services such as VOD, live television and music videos. Since the limited capacity of cellular networks is shared among users and digital video requires high data capacity, low resolution images and a limited number of available programs to a restricted number of users have characterized mobile television so far. Future wireless networks and possibly new spectrum allocation may, in the future, permit the delivery of higher resolution images and more programming to more users.
 - Mobile television receivers are expected to become integrated with existing portable devices such as personal players (e.g. iPods), cellular phones and portable computers.
 - As noted above, small-size portable devices generally characterize mobile television, resulting in small size displays. Given mobile television’s growth, it appears that consumers are willing to trade picture quality for access to video services anytime, anywhere. Experiments have shown that simply down-sampling broadcast material to accommodate the resolution of mobile television is not the best way to provide this

service. Mobile television services are more suited to broadcasting news, short video clips, previews, music video, etc., rather than longer programs such as full feature films. Content must be properly re-packaged to accommodate this new delivery medium. From this point of view, mobile television does not directly compete with regular television broadcasting, but may represent an opportunity for broadcasters and program producers to reposition their program material for another market.

- Mobile television services' growth in Canada may be supported by continuing allocation of spectrum by the Department for flexible use within or outside the television frequency band. This new spectrum would be of interest, not only to existing broadcasters and to cellular network operators, but also to new players.

76. As to the future, Bell Mobility Inc. (Bell Mobility) predicts that wireless mobile video will complement rather than compete with regular viewing. In the short term, mobile operators such as Bell Mobility will have limited bandwidth to devote to video applications, resulting in lower picture capability (low refresh rate on a small screen). To date, current audio-visual choices have been somewhat limited by rights holders. The handset battery and premium pricing will limit consumers' usage levels. Accordingly, for the foreseeable future, mobile streaming video will in no way be comparable to viewing quality or entertainment choices available on conventional television. However, many mobile subscribers will find the ability to receive live or recorded audio visual transmissions regardless of their location to be of value, and therefore the market is expected to grow.

3. Audio-visual technologies' predicted evolution over the coming years

77. In addition to the predictions included in the comments in the previous section of this report, SRG predicts that:
- Growth over the next five years will shift to personal digital technologies driven by broadband connectivity, including digital music and video players, ultra-portable PCs, digital cameras, mobile and smart phones and associated content and services.
 - As more consumers choose personal digital technologies, growth will slow for some household technologies such as digital cable and DTH.
 - Between 2000 and 2004, the number of households with access to digital cable or DTH quadrupled from 10% to 40%. Since then, growth has been relatively slow: from 40% to 44% between 2004 and 2006. SRG's research suggests that most of the consumers who have the greatest interest in digital television have already switched. Accordingly, digital cable and DTH is expected to experience slow growth in the medium term, i.e., from 2006 to 2011, with a projected combined ceiling of 58% to 60% penetration of Canadian households by 2011.

- Without question, television's ultimate future is on-demand. However, it is still questionable whether Canadians will choose to receive their on-demand television programming by means of a set-top PVR, by cable VOD, or on a PC or screen connected to the broadband Internet.
- In the absence of a super-brand such as TiVo in the Canadian marketplace or aggressive deployment by distributors, growth in PVR penetration will likely continue to be slower than what has been observed in the United States.
- On-demand use via the cable or DTH platform (e.g., PVR or VOD) will increase in the next five years to approximately 30% of all Canadian households. This growth will be gradual, year-by-year, contrary to the explosive growth in DVD penetration and Internet use over the last five to six years.
- Given the significant number of Canadians who are part of the boomer generation, traditional linear media, which are generally the choice of older generations, will continue to co-exist in the medium term with on-demand media, the choice of younger generations. It will take about ten years before the present generation exerts its full influence as the dominant segment in the Canadian consumer landscape.

78. Cocego, whose position is representative of the views presented in a number of submissions, maintains that audio-visual technologies' evolution in the near to medium term will be influenced mainly by improvements to already existing digital reproduction, transmission, conditional access, reception and storage technologies, as opposed to new breakthrough technologies.

79. Quebecor/Videotron (QMI), for its part, added that the future lies in new broadcast platforms being deployed everywhere by all the major stakeholders:

- iPod makes television programs available, as do all the wireless companies, and Blackberry has followed suit. With new features, PVR are growing in use. All the distributors are enhancing the performance of their networks, and so on. The environment that is emerging is a multiplatform one, characterized by the development of on-demand services that are financed by advertising, syndication and subscriptions.
- The mobility of consumers and their flexibility in terms of time of consumption are at the root of the growth of the new platforms. Service providers no longer monitor the habits of consumers as they did in the past; rather, consumers dictate the conditions for delivery of the products they receive. Their ever-increasing autonomy is the result of constantly changing technology.

- Broadcasters must keep up with these changes or, better still, be the agent for them. Cultural content and the adoption of new technologies are two necessary and essential conditions. One cannot progress without the other. At the centre of this progress are the consumers, who, through their choices – both in terms of the quality of products and the technology that delivers them – will ensure the success of our cultural enterprises.
- QMI indicated that it has no choice but to make massive investments in order to offer the consumer the services that can be obtained elsewhere and to do so under the best conditions possible, i.e., to make audiovisual content available on all developing platforms.

80. Shaw identified five enabling technologies – video streaming, digital music, IPTV, advanced game consoles and multimedia mobile telephones – all of which have emerged since 2000 and are now being used by new entrants to offer services which compete with the Canadian broadcasting system.

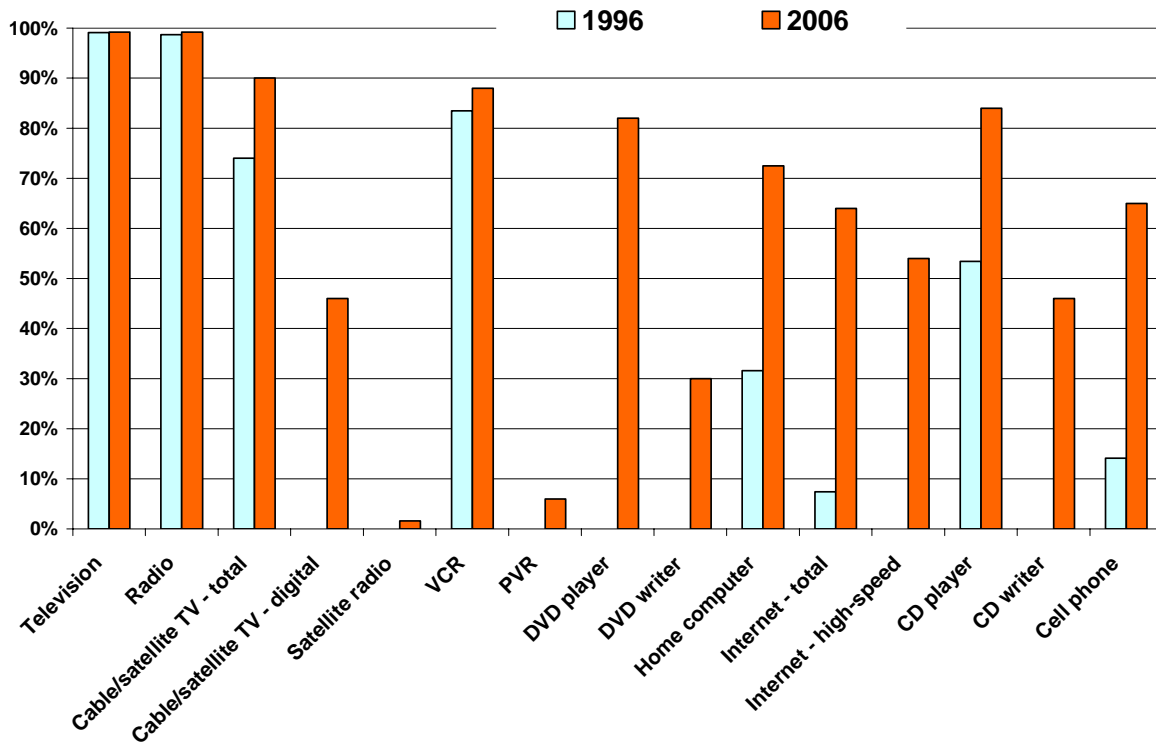
- According to Shaw, these technologies will allow Canadians to create their own content and become their own broadcasters; to access and package content of their choice across national boundaries and without regulatory restriction; to unsubscribe from basic cable and access mainstream broadcast content on a pay-per-view basis without mandatory Canadian content; to bypass cable and other DTH networks to access broadcast content on other types of broadband networks; and to access broadcast content on a variety of devices other than televisions. Televisions face the distinct possibility of becoming a secondary choice after personal computers, PDAs and multimedia mobile telephones.
- For the future, all of these technologies will continue to improve rapidly. In addition to these technological advancements, new types of competitors and new business models that compete with traditional broadcasting distribution undertakings will be aided by the increased availability of new technologies, and the increasing familiarity and comfort of Canadians with the use of technology.

Section II: Usage of audio-visual technologies by Canadians

A. Changes in the usage of audio-visual technologies by Canadians since 1 January 2000

81. Over the last five to ten years, the number of new technologies that have become available to Canadians, and the speed at which Canadians have adopted them, have increased significantly. As illustrated by the chart below, there has been a marked change in Canada's technology landscape:

Chart 3 - Percentage of Canadian households with selected technologies, 1996 and estimates for 2006

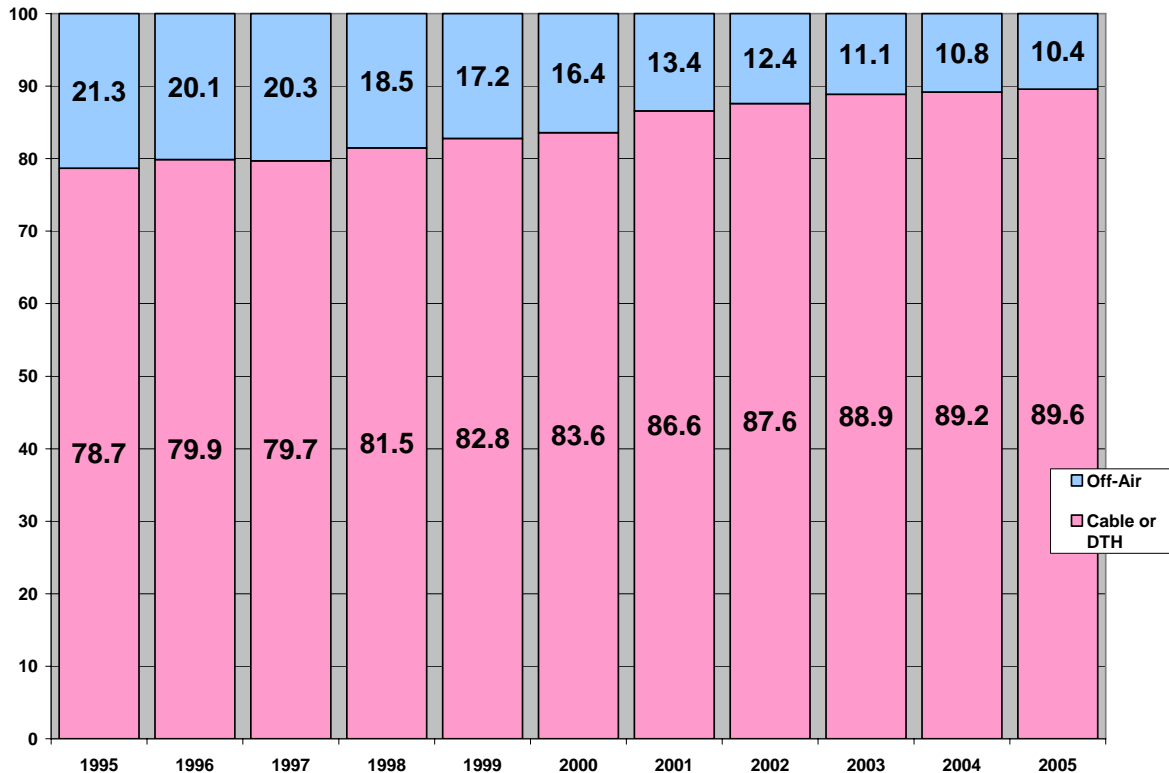


Sources: Statistics Canada; Communications Management Inc.; Industry sources
 (Figure ES-1, located on page 2 of *Technology and broadcasting: Implications for public policy*, Communications Management Inc., 1 September, 2006, prepared for CanWest MediaWorks Inc. and CHUM Limited. This chart also reflects revised 1996 percentage of the households with cable/satellite from roughly 60% to 74%: Figure 7 (revised) 17 November 2006.)

82. The key changes in usage of audio-visual technologies by Canadians relate, on the one hand, to the off-air reception of television signals and, on the other hand, to the transition from analog to digital television signal.

83. There has been a continuing decline in off-air reception of conventional television signals over the last ten years, as illustrated in Chart 4 below, provided by CMRI:

Chart 4 - Percentage of Canadians With Cable/DTH vs Off-Air Reception, All Canada, Persons 2+, Fall 1995 – Fall 2005



Source: CMRI (BBM)

(page 29 of *Television Industry, Television, the Internet and New Technologies in 2006*, CMRI, August 2006, prepared for TELUS, SaskTel, MTS Allstream and Bell Canada)

84. According to the above chart, only one in ten Canadians (10%) received their television signals off-air in 2005, down from more than one in six (16%) just five years ago.
85. These changes have not, however, been consistent between Canada's two official language communities. The table below presents satellite, cable and off-air penetration rates for English Canada (Canada excluding Quebec) and Quebec:

Table 16 Satellite, Cable and Off-air Penetration Rates %

	Canada Excluding Quebec			Francophone Quebec		
	Satellite	Cable	Off-Air	Satellite	Cable	Off-Air
Area Population						
1,000,000 +	14%	77%	8%	18%	59%	23%
100,000 - 1,000,000	22%	67%	10%	19%	69%	12%
50,000 - 100,000	39%	52%	9%	31%	60%	9%
< 50,000	50%	37%	13%	40%	50%	10%

Source: *BBM Fall 05 / Spring 06, Nielsen 05-06*
(CBC / Radio-Canada, page 41)

86. In English Canada, off-air penetration is quite low in all areas, regardless of population size. In Quebec, the off-air penetration rate is comparable to that of similar-sized urban areas in English Canada, with the exception of the larger urban areas, where it is much higher.
87. Although the current off-air reception rate of 23% (almost 1 in 4) in the large markets in Quebec is down from the 30% of five years ago, it is nevertheless much higher than the 8% off-air penetration rate in comparable sized areas of English Canada.
88. The distribution of television signals in Canada via BDUs has continued to grow in recent years, as is illustrated in the following table:

Table 17 Penetration of over-the-air (off air) and broadcasting distribution undertakings (BDUs) among Canadian households

	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05
Anglophones						
Off-Air	22.4	21.2	19.4	12.6	13.1	12.8
Cable/Satellite	77.6	78.8	80.6	87.5	86.9	87.2
Analog	-	-	61.5	58.7	52.7	50.0
Digital	-	-	8.2	13.4	14.5	16.2
Satellite	-	-	10.9	15.4	19.7	21.0
Francophones						
Off-Air	30.0	29.7	29.9	22.8	20.9	20.4
Cable/Satellite	70.0	70.3	70.1	77.2	79.2	79.6
Analog	-	-	56.2	53.8	47.7	46.8
Digital	-	-	4.7	6.7	10.9	12.4
Satellite	-	-	9.2	16.7	20.6	20.4

Source: Nielsen
(CBC / Radio-Canada, page 42)

89. In 2000-2001, less than 79% of Anglophone households in Canada received their television signals via BDUs, whereas in 2004-2005, more than 87% received their television signals in this manner. As for Francophone households, in 2000-2001, only about 70% received their television signals via BDUs, whereas in 2004-2005, almost 80% did.
90. Regarding the transition from analog to digital television-signals, cable subscribers receive a combination of both types. While the delivery of analog signals across Canada has declined, digital signal penetration has increased. Digital cable subscriptions increased significantly between 2001-2002 and 2004-2005, almost doubling to 16.2% of Anglophone households and almost tripling to 12.4% of Francophone households.

91. As noted in the previous section, DTH providers (satellite) have always provided all-digital services. Although satellite penetration is roughly equal in both the Anglophone and Francophone markets, combining digital cable and satellite penetration rates shows that 37.2% of Anglophone subscribers in 2004-2005 received digital service, compared to 19.1% in 2001-2002, whereas 32.8% of Francophone subscribers in 2004-2005 received digital service, compared to 14.1% in 2001-2002.
92. The following sections look at changes that have occurred in Canadian audience tuning to both radio and television, and at changes that have occurred in the use of different audio-visual technologies by Canadians.

1. Changes to audience tuning to radio and television

a) Audience tuning data - radio

93. Overall radio tuning habits in Canada have remained relatively stable over the last five years, with two exceptions: (i) the 12-34-year-old demographic has experienced the greatest general decline in radio tuning, and (ii) there has been a noticeable shift in tuning from AM radio to FM radio.

i. Decline for the 12-34-year-old demographic

Table 18 Per capita listening hours by age group

Average weekly hours tuned per capita								
BBM Fall 2000 – 2005 – all persons 12+, Monday to Sunday, 5 a.m. to 1 a.m.								
	All persons 12+	Teens 12-17	Adults					
			18-24	25-34	35-49	50-54	55-64	65+
2000	20.3	10.5	18.1	20.6	21.8	21.9	22.8	22.4
2001	20.1	10.1	17.3	20.5	21.6	21.6	22.7	22.3
2002	20.2	9.4	16.7	20.1	21.7	22.3	23.1	22.8
2003	19.5	8.5	16.3	19.3	21.3	21.8	21.9	22.3
2004	19.5	8.5	15.7	19.3	21.5	21.6	22.1	22.3
2005	19.1	8.6	15.2	18.1	21.0	21.5	21.9	21.6
<i>Growth⁽¹⁾ 2000 to 2005</i>	-1.2	-1.9	-2.9	-2.5	-0.8	-0.4	-0.9	-0.8

* In average hours

Source: 2006 Broadcasting Policy Monitoring Report, Table 2.1

94. The above table shows that from 2000 to 2005, per capita radio listening declined by approximately one hour and fifteen minutes per week, which suggests a downward trend in radio listenership.

95. As noted above, this decline is most notable for the 12-34 demographic (and especially the 18-24 demographic), the primary users of new emerging audio-visual technologies, and is relatively minimal for the 35-65+ demographic. As for the teen (12-17) demographic specifically, it has always recorded the lowest radio tuning levels. Whether this means that, unlike their parents, the three age groups within the 12-34 demographic will continue to stay away from radio as they grow older remains to be seen.

ii. AM to FM

96. The following table sets out the average hours that Canadian English-language and French-language AM and FM radio stations were tuned to over an average week during the BBM fall surveys that were administered from 2000 to 2005.

Table 19 Radio listening in an average week

BBM Fall – all persons 12+, Monday to Sunday, 5 a.m. to 1:00 a.m.							
	2000	2001	2002	2003	2004	2005	Increase/ decrease 2000 to 2005
AM English	126.6	126.2	122.2	117.6	114.1	111.2	-12.1
AM French	15.9	15.4	14.6	12.7	11.3	10.1	-36.5
FM English	267.5	267.0	276.2	275.9	283.5	280.2	4.7
FM French	92.5	94.5	99.5	97.4	101.2	100.3	8.4
Other	29.3	29.8	28.0	26.0	28.0	29.8	1.7
<i>Total average weekly hours (000,000)</i>	531.8	532.9	540.5	529.6	538.1	531.6	-0.04

Source: Calculated from the 2006 Broadcasting Policy Monitoring Report, Table 2.2. Note: Minor variances are due to rounding.

97. The following table sets out the percentage of hours that Canadian English-language and French-language AM and FM radio stations were tuned to over an average week during the same BBM Fall surveys.

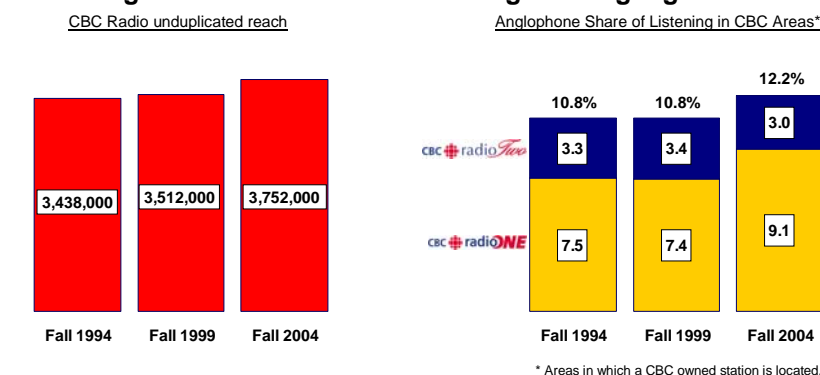
Table 20 Radio tuning share in an average week

BBM Fall – all persons 12+, Monday to Sunday, 5 a.m. to 1:00 a.m.							
	Percentage (%) of hours tuned						Increase/ decrease 00 to 05
	2000	2001	2002	2003	2004	2005	
AM English	23.8	23.7	22.6	22.2	21.2	21.0	-11.8
AM French	3.0	2.9	2.7	2.4	2.1	1.9	-36.7
FM English	50.3	50.1	51.1	52.1	52.7	52.7	4.8
FM French	17.4	17.7	18.4	18.4	18.8	18.9	8.6
Other	5.5	5.6	5.2	4.9	5.2	5.6	-1.8
Total	100	100	100	100	100	100	
<i>Total average weekly hours (000,000)</i>	531.8	532.9	540.5	529.6	538.1	531.6	-0.04

Source: BBM Television Databook 2005-2006 (2006 Broadcasting Policy Monitoring Report, Table 2.2)

98. As the tables above show, in terms of the number of hours radio was tuned to and in terms of radio tuning share, both over an average week, while tuning to English- and French-language FM radio posted marginal increases, tuning to English- and French-language AM radio posted marked declines from 2000 to 2005.
99. In its submission, the CBC noted that it identified such trends in radio listening several years ago and responded by strengthening both its local content and its connection with local communities. The CBC also undertook a major repositioning of its radio services, revamping its programming so as to better meet the tastes and needs of all listeners, including younger audiences. The CBC noted that, as a result of these forward-looking initiatives, its reach and market share in conventional radio has increased significantly in recent years, as shown in the following chart.

Chart 5 - Full coverage reach and share of CBC English-language radio station

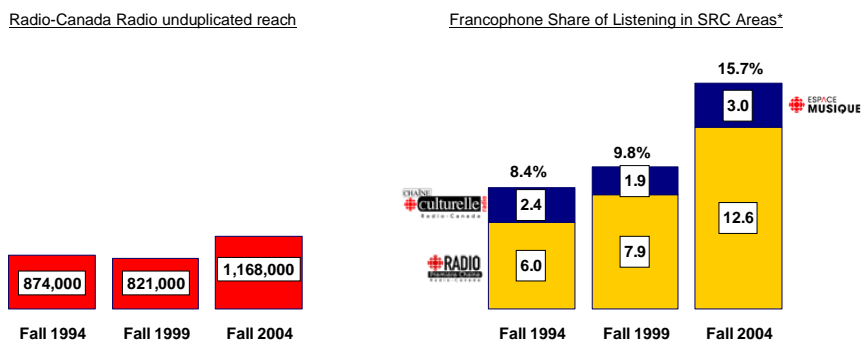


Source: BBM (Fall Sweeps)

* Areas in which a CBC owned station is located.

(CBC / Radio-Canada, page 23)

Chart 6 - Full coverage reach and share of CBC French-language radio station



Source: BBM (Fall Sweeps)

* Areas in which an SRC owned station is located. Based on listening to French-language stations

(CBC / Radio-Canada, page 23)

100. Based on this data and its own experience, the CBC suggested that while conventional radio faces serious challenges, those challenges can be met if the needs and expectations of listeners are identified and addressed. Thus, the CBC stated that conventional radio – and CBC services in particular – should continue to have an important role to play in the audio world for the foreseeable future.

101. In section I of this document, it was noted that satellite radio, among other new platforms from which to access audio content, have become available to Canadian consumers. Along with the other new technologies, satellite radio provides consumers with access to a greater volume and choice of music as well as greater flexibility and control over when they can listen to this music. To date, two satellite radio undertakings have recently gone to air. From the information available at the time of writing this report, CSR reports 120,000 subscribers while Sirius reports 200,000 subscribers.

b) Audience tuning date – television

102. The following tables provide the average weekly viewing hours by age group for the 2001-2002 to 2004-2005 broadcast years, using BBM national metered data for all persons 2+, Monday to Sunday, 2 a.m. to 2 a.m.

Table 21 Per viewer¹⁵ average weekly viewing hours by age group

Broadcast year	All persons 2+	Children 2-11	Teens 12-17	Adults			
				18+	18-34	18-49	25-54
2001/02	28.7	19.3	20.9	30.9	25.0	26.5	27.7
2002/03	28.6	18.8	21.1	30.6	24.4	25.9	27.3
2003/04	28.6	19.3	21.3	30.7	24.6	26.0	27.5
2004/05	28.1	20.5	21.3	29.9	23.3	25.0	26.5

Source: BBM Television Databook 2005-2006
(2006 Broadcasting Policy Monitoring Report, Table 3.1)

Table 22 Per capita¹⁶ average weekly viewing hours by age group

Broadcast year	All persons 2+	Children 2-11	Teens 12-17	Adults			
				18+	18-34	18-49	25-54
2001/02	23.7	16.3	16.4	25.7	19.8	21.4	22.8
2002/03	23.4	15.5	16.0	25.4	19.3	20.8	22.4
2003/04	24.7	17.5	17.9	26.5	20.7	22.0	23.3
2004/05	25.1	19.2	18.6	26.6	20.4	22.0	23.2

Source: BBM Television Databook
(2006 Broadcasting Policy Monitoring Report, Table 3.2)

103. According to Nielsen data, the Canadian per capita average weekly viewing hours for all persons 2+ in 2003-2004 and 2004-2005 were 26.5 and 25.7 respectively, which reflect the BBM findings in the above tables.

¹⁵ Average number of hours that the viewer spends watching television in an average week (total viewing minutes divided by average daily reach).

¹⁶ Average number of hours that the population spends watching television in an average week (average hours divided by the population).

Table 23 Viewing hours of Canadian and non-Canadian services by language and type of service

BBM Metered data								
2002-03, 2003-04 and 2004-05 broadcast years⁽¹⁾								
for all persons 2+, Monday to Sunday, 2 a.m. to 2 a.m.								
	Quebec				All regions excluding Quebec			
	02-03	03-04	04-05	<i>Inc./Dec %</i>	02-03	03-04	04-05	<i>Inc./Dec %</i>
CBC & affiliates	2.0	2.4	2.2	10.0	30.6	38.1	30.1	-16.3
Private conventional	8.2	9.0	9.4	14.6	147.8	152.8	161.0	8.9
Pay & specialty	7.3	8.8	8.4	15.1	155.8	184.3	191.1	22.7
Digital pay & specialty	1.0	1.3	0.4	-60.0	9.0	11.4	14.8	64.4
Total English-language	18.5	21.4	20.4	10.3	342.7	385.1	396.5	15.7
SRC & affiliates	19.5	21.3	27.3	40.0	0.5	1.1	0.5	-
Private conventional	67.5	72.4	75.9	12.4	1.0	0.5	0.5	50.0
Télé-Québec	4.5	4.8	7.5	66.7	0	0	0	-
Pay & specialty	44.8	53.4	60.2	34.3	1.0	1.1	0.5	50.0
Digital pay & specialty	0	0	0.8	-	0	0	0	-
Total French-language	136.3	150.4	171.8	26.0	2.5	2.7	1.0	-60.0
Private conventional	0.5	0.6	0.8	60.0	5.5	6.5	7.1	29.1
Pay & specialty	0.2	0.2	0.2	-	2.5	3.3	3.3	32.0
Digital pay & specialty	0	0	0	-	0	0	0	-
Total Other languages	0.7	0.8	1.0	66.7	8.0	10.3	10.4	15.6
APTN	0.0	0.2	0.0	-	0.5	0.5	0.5	-
Total Canadian services	155.6	172.7	193.2	24.2	353.7	398.6	409.1	15.7
US conventional	6.0	6.1	5.7	-5.0	56.6	57.1	50.9	-10.1
PBS	0.8	0.6	1.0	25.0	8.0	8.2	7.7	-3.8
Pay & specialty	3.7	3.5	2.9	-21.6	66.6	62.0	61.9	-7.1
TOTAL non-Canadian services	10.4	10.1	9.6	-7.7	131.3	127.2	120.5	-8.2
VCR ⁽²⁾	7.8	6.3	0.6	-90.6	23.5	19.6	17.0	-27.7
Other ⁽³⁾	0.8	0.9	1.2	50.0	12.0	13.6	14.2	18.3
Total hours (000,000)	167.0	184.1	204.0	22.2	501.0	543.8	547.7	9.3

Note: Minor variances are due to rounding

(1) Broadcast years: 2002/03: September 1, 2002 to August 31 2003; 2003/04: September 1, 2003 to August 29, 2004; 2004/05: August 30, 2004 to August 28, 2005.

(2) A change in methodology occurred as of August 30, 2004, when the wireless, passive Portable People Meter (PPM) technology replaced existing wired meter service (PMT) for Quebec (Franco), and diaries for the Montreal (Franco) market. Please note that when analyzing the 2004-2005 data for Quebec (Franco), VCR was not measured.

(3) Includes cable services such as CPAC, real estate, TV Guide, The Shopping Channel, Shaw Community Cable, CPAC-F, Télé-Annonce, provincial services such as Access, Knowledge, Ontario Legislature, SCN, TVO, Assemblée nationale and TFO.

Source: InfoSys, BBM metered data, calculated from the data in Table 24 below.

(2006 Broadcasting Policy Monitoring Report, Table 3.3)

104. According to the above table:

- viewing hours to Canadian English-language conventional television services increased by 8.9% while viewing hours to French-language conventional television services increased by 12.4%;
- viewing hours to Canadian English-language pay and specialty services increased by 22.7% while viewing hours to French-language pay and specialty services increased by 34.3%; and
- for all regions excluding Quebec, viewing hours to US conventional television decreased by 10.1% while viewing hours to US pay and specialty services decreased by 7.1%.

Table 24 Viewing share of Canadian and non-Canadian services by language and type of service

BBM Metered data – 2002-03, 2003-04 and 2004-05 broadcast years⁽¹⁾ for all persons 2+ Monday to Sunday, 2 a.m. to 2 a.m.												
Viewing share %	All Canada				Quebec				All regions excluding Quebec			
	02/03	03/04	04/05	<i>Inc./Dec.</i>	02/03	03/04	04/05	<i>Inc./Dec.</i>	02/03	03/04	04/05	<i>Inc./Dec.</i>
Canadian services												
English-language												
CBC & affiliates	4.9	5.6	4.3	-0.6	1.2	1.3	1.1	-0.1	6.1	7.0	5.5	-0.6
Private conventional	23.2	22.0	22.7	-0.5	4.9	4.9	4.6	-0.3	29.5	28.1	29.4	-0.1
Pay & specialty	24.3	26.7	27.1	2.8	4.4	4.8	4.1	-0.3	31.1	33.9	34.9	3.9
Digital pay & specialty	1.4	1.7	2.0	0.6	0.6	0.7	0.2	-0.4	1.8	2.1	2.7	0.9
Total English-language	53.8	56.0	56.1	2.3	11.1	11.6	10	-1.1	68.4	70.9	72.4	4.1
French-language												
SRC & affiliates	3.0	2.8	3.6	0.6	11.7	10.9	13.4	1.7	0.1	0.2	0.1	-0.1
Private conventional	10.2	9.9	9.8	-0.4	40.4	39.3	37.2	-3.3	0.2	0.1	0.1	-0.2
Télé-Québec	0.7	0.7	1.0	0.3	2.7	2.6	3.7	1.0	0	0	0	0
Pay & specialty	6.9	7.4	7.7	0.8	26.8	29.0	29.5	2.8	0.2	0.2	0.1	-0.1
Digital pay & specialty	0	0	0.1	0.1	0	0	0.4	0.4	0	0	0	0
Total French-language	20.8	20.8	22.2	1.4	81.6	81.7	84.2	2.6	0.5	0.5	0.2	-0.3

Viewing share %	All Canada				Quebec				All regions excluding Quebec			
	02/03	03/04	04/05	Inc./Dec.	02/03	03/04	04/05	Inc./Dec.	02/03	03/04	04/05	Inc./Dec.
Other-languages												
Private conventional	0.9	1.1	1.1	0.2	0.3	0.3	0.4	0	1.1	1.2	1.3	0.2
Pay & specialty	0.4	0.4	0.4	0	0.1	0.1	0.1	0	0.5	0.6	0.6	0.1
Digital pay & specialty	0	0	0	0	0	0	0	0	0	0	0	0
Total Other-languages	1.3	1.5	1.5	0.2	0.4	0.4	0.5	0.1	1.6	1.9	1.9	0.3
APTN	0.1	0.1	0.1	0	0	0.1	0	-0	0.1	0.1	0.1	0.1
Total Canadian services	76.0	78.4	79.9	3.9	93.2	93.8	94.7	1.5	70.6	73.3	74.7	4.1
Non-Canadian services												
US conventional	9.4	8.6	7.7	-1.7	3.6	3.3	2.8	-0.8	11.3	10.5	9.3	-2.1
PBS	1.3	1.2	1.2	-0.1	0.5	0.3	0.5	0	1.6	1.5	1.4	-0.1
Pay & specialty	10.5	9.0	8.7	-1.8	2.2	1.9	1.4	-0.7	13.3	11.4	11.3	-1.9
TOTAL non-Canadian services	21.2	18.8	17.6	-3.6	6.2	5.5	4.7	-1.5	26.2	23.4	22.0	-4.1
Other services												
VCR ⁽³⁾	4.9	3.6	2.4	-2.5	4.7	3.4	0.3	-4.4	4.7	3.6	3.1	-1.6
Other ⁽²⁾	1.9	2.0	2.0	0.1	0.5	0.5	0.6	0	2.4	2.5	2.6	0.2
Total	100	100	100		100	100	100		100	100	100	
<i>Total hours (000,000)</i>	<i>667.9</i>	<i>727.9</i>	<i>751.7</i>	<i>83.7</i>	<i>167.0</i>	<i>184.1</i>	<i>204.0</i>	<i>37.0</i>	<i>501.0</i>	<i>543.8</i>	<i>547.7</i>	<i>46.7</i>

Note: Minor variances are due to rounding.

(1) Broadcast years: 2002/03: September 1, 2002 to August 31 2003; 2003/04: September 1, 2003 to August 29, 2004; 2004/05: August 30, 2004 to August 28, 2005.

(2) A change in methodology occurred as of August 30, 2004, when the wireless, passive Portable People Meter (PPM) technology replaced existing wired meter service (PMT) for Quebec (Franco), and diaries for the Montreal (Franco) market. Please note that when analyzing the 2004-2005 data for Quebec (Franco), VCR was not measured.

(3) Includes cable services such as CPAC, real estate, TV Guide, The Shopping Channel, Shaw Community Cable, CPAC-F, Télé-Annonce, provincial services such as Access, Knowledge, Ontario Legislature, SCN, TVO, Assemblée nationale and TFO.

Source: InfoSys, BBM metered data

(2006 Broadcasting Policy Monitoring Report, Table 3.3)

105. According to the above table:

- Canadian English-language conventional services, including the CBC, captured a 27% share of total viewing in 2004-2005, down slightly from 28.1% in 2002-2003. French-language conventional services, including Radio-Canada, achieved a 50.6% share of total viewing in Quebec in 2004-2005, also down slightly from 52.1% in 2002-2003. The viewing share to all conventional Canadian English- and French-language television declined to 40.4% in 2004-2005 from 41.3% in 2002-2003.

- Canadian English-language pay and specialty services, including digital services, captured a 29.1% share of total viewing in 2004-2005, up from 25.7% in 2002-2003. French-language pay and specialty services, including digital services, captured a 29.9% share of total viewing in Quebec in 2004-2005, also up slightly from 26.8% in 2002-2003. The viewing share to all Canadian pay and specialty services actually increased to 36.9% in 2004-2005 from 32.6% in 2002-2003.
- US conventional television saw its share of total Canadian viewing decline to 7.7% in 2004-2005 from 9.4% in 2002-2003
- US pay and specialty services saw their share of Canadian viewing decline to 8.7% in 2004-2005 from 10.5% in 2002-2003.

2. Change in usage of other audio-visual technologies

a) Personal computers and Internet

Table 25 Personal computer ownership rates of Canadian households

	1996	1998	1999	2000	2001	2002	2003	2004 ¹⁷	2004	2005	2006
CyberTRENDS	-	49%	53%	55%	63%	64%	64%	68%	71%	74%	-
SRG	48%	53%	-	62%	-	-	69%	-	-	78%	80%

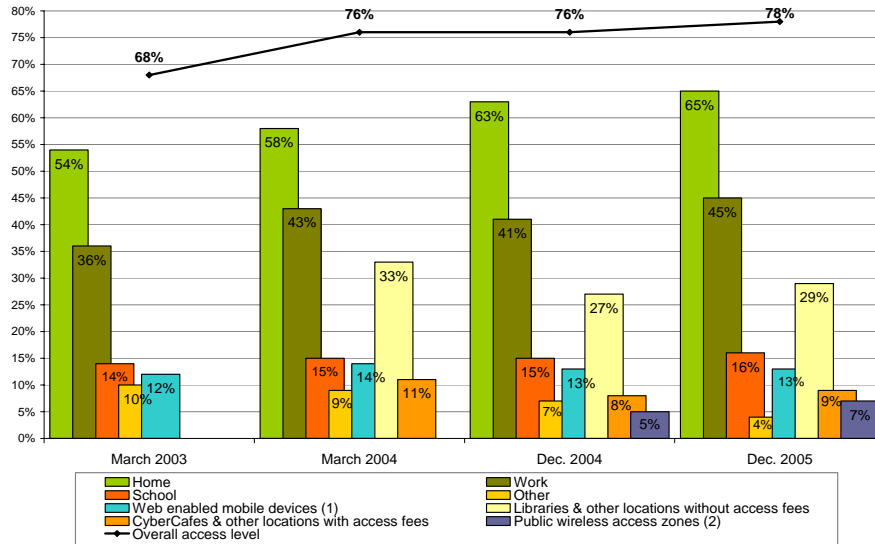
Sources: CyberTRENDS, ComQUEST Research, Research Dimensions: March 1998 to 2004 and December 2004 to 2005 editions (2006 Broadcasting Policy Monitoring Report, Table 6.1); page 28 from Fast Forward™ Trend Analysis prepared by SRG for CRTC – August 2006

106. The above table shows that overall PC ownership rates increased by approximately 17 percentage points, between December 2000 and December 2005.

- According to CyberTRENDS, significant ownership increases were noted among individuals between 55 and 64 years of age (7%) and those 65 years of age or greater (12%).
- Also, according to CyberTRENDS, income continues to be a determining factor in computer ownership. In December 2005, 96% of households with an income over \$80,000 owned computers, whereas only 49% of households with an income under \$20,000 owned computers.

¹⁷ The first 2004 percentage figure is for March 2004 whereas the second 2004 percentage figure is for December 2004.

Chart 7 - Overall Internet access and Internet access by location



(1) Such as BlackBerry, cell phone or PDA

(2) Sometimes referred to as Hotspots

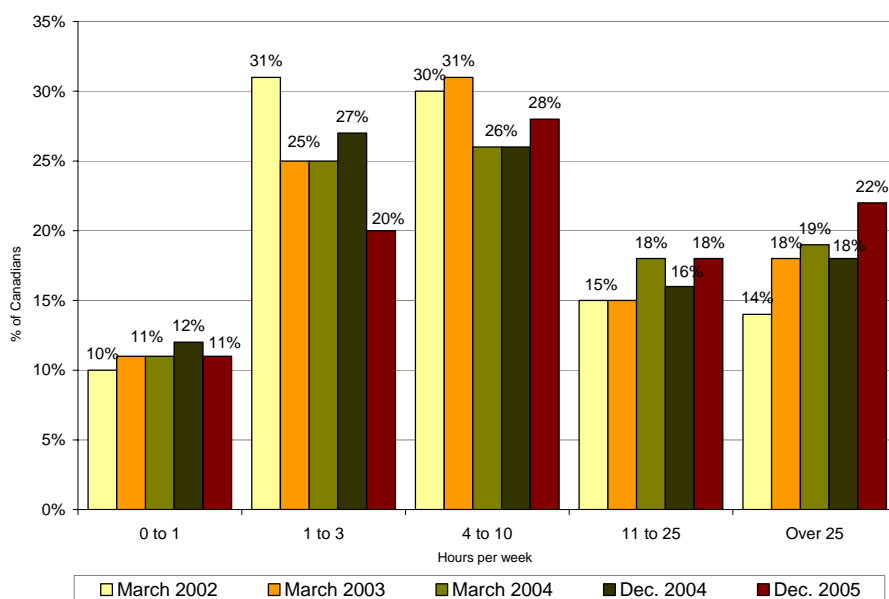
Source: CyberTRENDS, ComQUEST Research, Research Dimensions: March 2003 and 2004, and December 2004 and 2005 editions

(2006 Broadcasting Policy Monitoring Report, Chart 6.1)

107. According to the above chart, the percentage of Canadians accessing (using) the Internet increased to 76% in March 2004 from 68% in March 2003; however, by the end of December 2005, Internet use had only increased a further two percentage points, to 78%.

108. Again, according to CyberTRENDS and ComQUEST Research, Research Dimensions, the percentage of Canadians having access to the Internet in 2005 was the highest in Ontario and British Columbia at 83%, while in Quebec and Atlantic Canada it was 71%. This compares to 2003 when Quebec had the lowest rate of access at 54%, while British Columbia had the highest at 77%. The percentage of Canadians using the Internet weekly (i.e., at least once in a given week) increased from 40% in 2000 to 60% in 2005.

Chart 8 – Usage of the Internet by Canadians, in terms of amount of time spent per week



Source: CyberTRENDS, ComQUEST Research, Research Dimensions: March 2003 and 2004, and December 2004 and 2005 editions (2006 Broadcasting Policy Monitoring Report, Chart 6.5)

109. The percentage of Canadians using the Internet for less than 1 hour per week remained relatively constant at 10-12% from 2002 to 2005.
110. During this same period, there was a decline, from 31% to 20%, in users who reported spending 1 to 3 hours per week on the Internet, while the percentage of users who reported spending 4 to 10 hours per week on the Internet remained relatively stable.
111. There appears to be a trend, however, towards a general increase amongst heavier users of the Internet, as those who reported spending more than 25 hours per week on the Internet jumped from 14% to 22% between 2002 and 2005.
112. In its submission, Bell referred to a recent Statistics Canada study entitled *The Internet: Is it Changing the Way Canadians Spend their Time?* This study found little in the way of significant differences among Internet users – including heavy Internet users – and non-users in terms of the amount of time they spend watching television. Bell considers this to be an important finding, as it calls into question the suggestion that the Canadian broadcasting system is under an immediate threat from the Internet.

Table 26 On-line activities of high-speed users vs. dial-up users

% of Canadian adults who connected to the Internet at least once a month most or some of the time

Activity	High-speed				Dial-up			
	March		December		March		December	
	2003	2004	2004	2005	2003	2004	2004	2005
Download / Listen to music	53	32	41	37	32	21	25	18
Downloading files or software	54	41	46	40	46	37	35	35
Chat	26	20	17	14	16	15	11	14
Watch video	29	27	27	29	17	11	13	13
Listen to radio	20	23	30	26	12	13	16	11
Shop on-line	25	28	32	30	16	21	26	27
Download movies	-	-	7	4	-	-	3	2
Download TV programs	-	-	5	5	-	-	2	1

Source: CyberTRENDS, ComQUEST Research, Research Dimensions: March 2003 to 2004 and December 2004 to 2005 editions

(2006 Broadcasting Policy Monitoring Report, Table 6.6)

113. The above table shows that high-speed Internet users spend a greater percentage of their time than dial-up Internet users on bandwidth-intensive activities such as downloading large files, which may be related to the faster data transfer rates that characterize high-speed Internet.
114. The table also shows that the use of the Internet to download music and files/software declined significantly from 2003 to 2005, for both high-speed and dial-up Internet service, whereas the use of the Internet to listen to radio, shop online and download movies and television programs increased over this same period.

Table 27 Listening to radio via the Internet

Fall survey	Total hours tuned via the Internet (000)	Share of total tuning (%)
2000	454	0.1
2001	634	0.1
2002	942	0.2
2003	778	0.1
2004	1,285	0.2
2005	1,728	0.3

Source: MicroBBM, Fall 1997 to Fall 2005, All Canada, Persons 12+ (2006 Broadcasting Policy and Monitoring Report, Table 6.7)

115. The table above shows that the amount of tuning to Canadian radio using the Internet increased steadily between 2000 and 2005, although the share of tuning to Canadian radio using the Internet was relatively minimal when compared to other means of accessing radio programming.

b) Personal digital devices

Table 28 Percentage of Canadians who reported using various digital audio-visual devices in December 2005 and how they used these devices

Devices		% of device users who are	
		Male	Female
Cell phones	59%	52	48
BlackBerry	3%	75	25
PDA	7%	66	34
MP3 Player	12%	60	34
iPod	4%	70	30
Webcam	8%	60	40
Percentage of cell phone, BlackBerry or PDA owners who used these devices to:			
Watch television	2%	72	28
Take pictures / record video	3%	75	25
Obtain news or weather	7%	72	28
Obtain sports scores	4%	97	3

Notes:

PDA is a pocket-sized device that combines computing, telephone/fax, Internet, and networking features used as a personal organizer.

iPod and MP3 players are also referred to as digital music players.

Webcam is a video camera, usually attached directly to a computer, which sends periodic images or continuous frames to a Web site.

Source: CyberTRENDS, ComQUEST Research, Research Dimensions: December 2005 edition

(2006 Broadcasting Policy Monitoring Report, Table 6.8)

116. Noting that none of the above devices, with the exception of cell phones, was available prior to 2000, it is clear that the audio-visual devices listed in the above table are finding their place in Canada's technological landscape. It is also worth noting that men are by far the dominant users of all of these technologies, particularly with regard to the uses listed in the lower portion of the table.

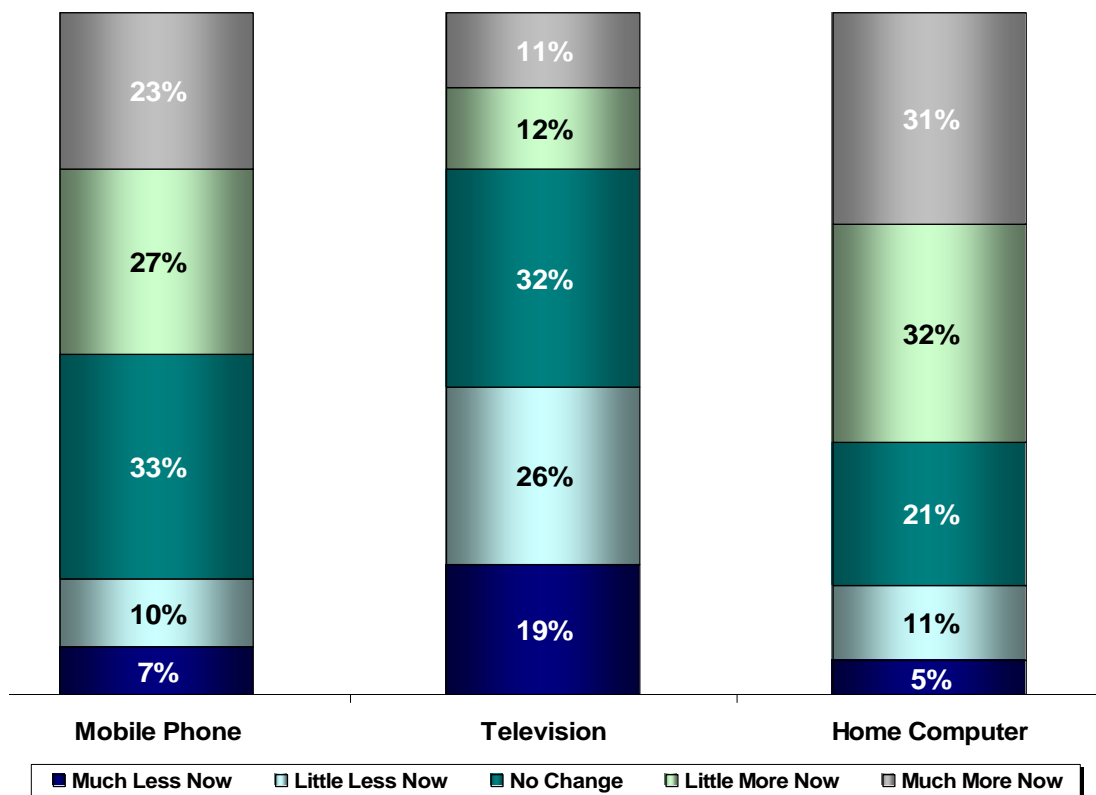
Table 29 Change in ownership of digital players by Canadians, in term of sex and age, 2003-2006

	2003	2004	2005	2006
	%	%	%	%
Canada	11	16	19	27
Male	14	19	22	29
Female	8	14	16	25
12-14	15	25	42	62
15-19	19	30	53	63
20-29	11	24	28	42
30-49	13	19	15	22
50+	5	6	7	10

Source: Page 40 of the Fast Forward™ Trend Analysis prepared by SRG for CRTC – August 2006

117. The above table shows that ownership of digital music players (such as iPods and MP3 players) has increased dramatically, from 11% in 2003 to a projected 27% in 2006. Also, men have generally shown a greater increase in ownership of these devices than women have, and 12-19-year-olds have shown a greater increase in ownership than have older Canadians.
118. According to the SRG study, about one in three (30%) of Canadian Internet users will have actively downloaded content in 2006, which is more than doubled (73%) by Canadians in the 15-19-year-old age group. Moreover, 29% of Canadian Internet users will have downloaded music in 2006, up from 20% in 2000; 8% will have downloaded a podcast in 2006, up from 5% in 2000; and 6-8% will have downloaded large files such as full-length movies or television shows in 2006, up from 5% in 2005. Regarding this final point, one-in-six (about 16%) Canadian Internet users in the 15-19 age group have downloaded a television show from the Internet.
119. Today, visual technology presents itself predominantly through three ubiquitous screens: the television screen, the computer screen and the mobile phone screen. The following chart provides an interesting and useful depiction of the change in the amount of time spent with each of these three screen types, over the 2-3 years preceding mid-2005.

Chart 9 - Change in time spent with three screens versus 2-3 years ago, as of mid-2005, Canadians 15-34



*Note: In the above chart the sequence from “much less” runs from bottom to top
 Source: Motorola Canada Ltd. News Release, “Canadian Youth Blazing the Trail for Third Screen Adoption,” October 19, 2005; Research Strategy Group, survey conducted for Motorola Canada Ltd, June 2005 (October 2005)
 (Page 29 of Technology and broadcasting: Implications for public policy, Communications Management Inc., 1 September 2006, prepared for CanWest MediaWorks Inc. and CHUM Limited)*

120. From this chart, it is interesting to note the relative increases in those who spend a “little more” time and “much more” time with both the mobile phone and the home computer, as compared to the same categories for television.
121. Finally, as noted in Table 29, ownership of digital music players such as iPods and MP3 players has more than doubled since 2003. The table below shows how the change in ownership rates of digital music players from 2003 to 2006 compares with the change in rates of ownership of digital cameras and digital video cameras over this same period.

Table 30 Change in rates of ownership of three digital devices

	2003	2004	2005	2006
Digital Music Player	11%	16%	19%	27%
Digital Camera	21%	33%	47%	60%
Digital Video Camera	-	-	25%	27%

Note: Digital Music Player includes iPods and MP3 players.

Source: Page 38 from the Fast Forward™ Trend Analysis prepared by SRG for CRTC – August 2006

122. Assuming that ownership equates directly to usage, the use of these devices has increased dramatically over this period. The greatest increase in ownership (and usage) has been with digital cameras, most of which are capable of allowing consumers to create their own digital videos, which can then be uploaded to various Internet sites.

B. Changes in the demand for various types of programming and programming services since 1 January 2000

1. Radio

123. As shown in Table 18 of the previous section, the demand for conventional radio tuning declined from 20.3 hours per week in 2000 to 19.1 hours in 2005. The biggest decline occurred among the 18-34-year-olds, which is consistent with this group also being those who tend to adopt any new emerging media platform the earliest and to the greatest degree.
124. With the advent, over the last five years, of new ways to access audio content, such as iPods, MP3 players, CD burners and Internet radio, Canadians are getting used to the idea of being able to choose the type of music programming they want to hear, the programming service on which they want to hear it, and the time and place at which they want to hear it. The data in the following table is taken from the MTM study provided in the CBC's submission:

Table 31 Rates of music player ownership and three types of Internet activity for Canadian Anglophones and Francophones 18 and over, 2005, in the month preceding the survey

	Anglophones 18+				Francophones 18+			
	18-34	35-49	50-64	65+	18-34	35-49	50-64	65+
iPod/MP3 Player penetration	42%	24%	13%	3%	23%	16%	7%	2%
Past month download podcast	12%	9%	4%	1%	5%	2%	2%	0%
Past month audio streaming	38%	25%	14%	6%	28%	17%	10%	3%
Past month music downloading	41%	18%	3%	3%	26%	11%	4%	2%

Source: CBC/Radio-Canada MTM, 2005
(CBC / Radio-Canada, page 51)

125. This table shows that 42% of Canadian Anglophones in the 18-34-year-old demographic owned an iPod and/or an MP3 player in 2005. This percentage was significantly higher than that of any other demographic. The fact that both iPods and MP3 players both require digital content explains how 41% of these individuals came to download music, and 12% came to download a podcast within the month preceding the survey. Given that 38% of these individuals also reported streaming music on the Internet during this same period, these technologies have certainly created a demand for this type of programming and the programming service, whether it is from P2P or from an on-line music service.
126. These trends in accessing audio content are comparable for Francophone Canadians 18 and over, although usage is generally lower for this linguistic group.

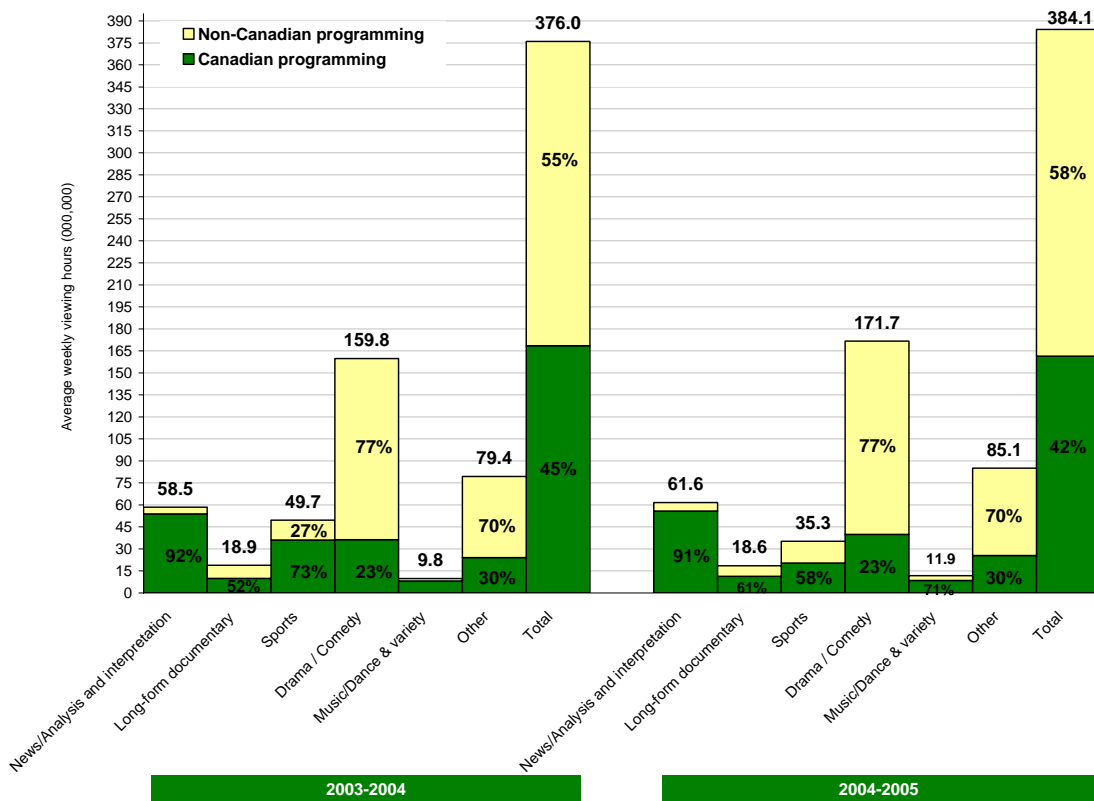
2. Television

127. As set out in Tables 27 and 24 above:
- the demand for television programming continued to increase as per capita average weekly viewing hours rose from 23.7 in 2001-2002 to 25.1 in 2004-2005;
 - Canadian English-language conventional television services, including the CBC, captured a 27% share of total viewing in 2004-2005, down slightly from 28.1% in 2002-2003. French-language conventional television services, including the SRC, captured a 13.4% share of total viewing in 2004-2005, also down slightly from 13.2% in 2002-2003. The viewing share to all conventional Canadian television declined to 40.4% in 2005 from 41.3% in 2003;
 - US conventional television saw its share of total Canadian viewing decline to 7.7% in 2005 from 9.4% in 2003;
 - the demand for Canadian English-language pay and specialty services, including digital services, rose as the medium captured a 29.1% share of total viewing in 2004-2005, an increase from the 25.7% in 2002-2003. French-language pay and specialty services, including digital services, captured a 7.8% share in 2004-2005, up slightly from 6.9% in 2002-2003. The viewing share to all Canadian pay and specialty services increased to 36.9% in 2004-2005 from 32.6% in 2002-2003;
 - US pay and specialty services saw their share of Canadian viewing decline to 8.7% in 2004-05, from 10.5% in 2002-2003,
 - Canadian other-language services, including ethnic services, increased their viewing share by 0.2% from 2002-2003, to 1.5% of hours viewed in 2004-2005; and

- per capita average weekly viewing hours increased across all age groups over the period 2001-2002 to 2004-2005, with children (2-11) and teens (12-17) reporting the largest increases.

128. The following chart illustrates the change in demand for Canadian and non-Canadian English-language programming by genre, from 2003-2004 to 2004-2005:

Chart 10 - Viewing of Canadian and non-Canadian programs distributed by English-language Canadian television services by program origin and genre – BBM metered data – 2003/04 and 2004/05 broadcast years – 2 a.m. to 2 a.m. - persons 2+ - average weekly hours (000,000)

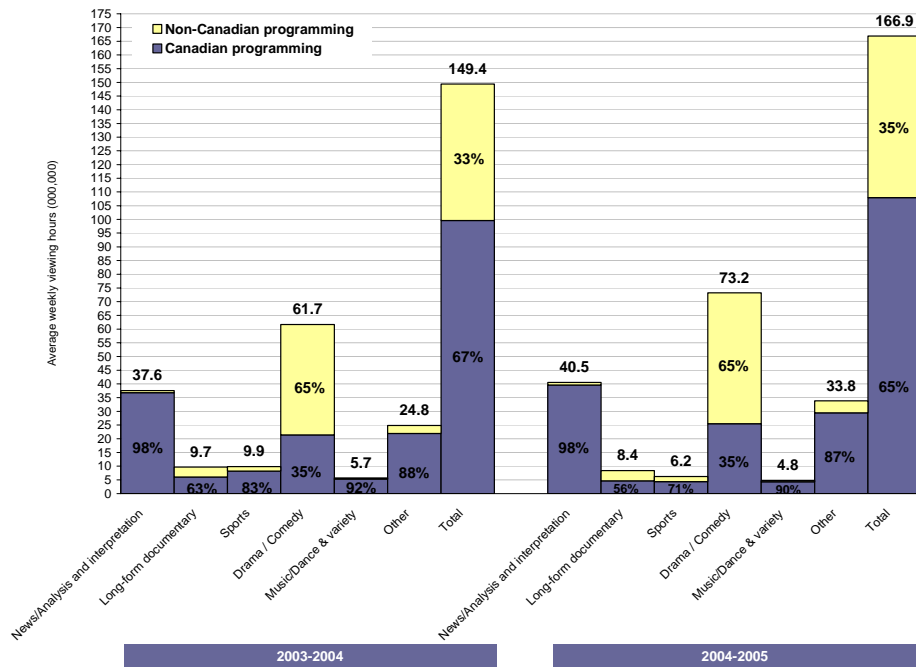


Based on Canadian services with available program level data that incorporates country of origin and program genre (2006 Broadcasting Policy Monitoring Report, Chart 3.2)

129. According to this chart, average weekly viewing to all genres of Canadian and non-Canadian English-language television programs increased by 2.1% in 2004-2005. However, viewing to all genres of Canadian English-language programs, when compared to total viewing to both Canadian and non-Canadian English-language programming combined, decreased from 45% in 2003-2004 to 42% in 2004-2005. Data for pre-2004 is available but has not been prepared on a basis consistent with the above and, therefore, is not comparable.

130. Drama/comedy continued to represent the most viewed English-language program category. The total number of hours viewed increased by 7.4% from 2003-2004 to 2004-2005, while the percentage that viewing to drama/comedy represented of the total hours of programming viewed increased to 44.7% in 2004-2005, from 42.5% in 2003-2004. Moreover, average weekly viewing hours to Canadian drama/comedy, as a percentage of the average weekly viewing hours to all drama/comedy (both Canadian and non-Canadian), remained constant at 23%, while the number of actual hours of Canadian drama/comedy viewed increased by 7.4%.
131. The following chart illustrates the change in demand for Canadian and non-Canadian French-language programming by genre, from 2003-2004 to 2004-2005:

Chart 11 - Viewing of Canadian and non-Canadian programs distributed by French-language Canadian television services by program origin and genre – BBM metered data – 2003/04 and 2004/05 broadcast years – 2 a.m. to 2 a.m. - persons 2+ - average weekly hours (000,000)



Based on Canadian services with available program level data that incorporates country of origin and program genre (2006 Broadcasting Policy Monitoring Report, Chart 3.6)

132. According to this chart, average weekly viewing to all genres of Canadian and non-Canadian French-language television programs increased by 11.7% in 2004-2005. However, viewing to all genres of Canadian French-language programs, when compared to total viewing to both Canadian and non-Canadian French-language programming combined, decreased from 67% in 2003-2004 to 65% in 2004-2005. As was the case for English-language programming, data for pre-2004 is available but has not been prepared on a basis comparable with the above.

133. As was also the case for English-language television, drama/comedy continued to represent the most viewed French-language program category. The total number of hours viewed increased by 18.6% in 2004-2005, while the percentage that viewing to drama/comedy represented of the total hours of programming viewed increased to 43.9% in 2004-2005, from 41.3% in 2003-2004. Moreover, average weekly viewing hours to Canadian drama/comedy, as a percentage of the average weekly viewing hours to all drama/comedy (both Canadian and non-Canadian), remained constant at 35%, while the number of actual hours of Canadian drama/comedy viewed increased by 6.5%.
134. The data in the following table shows that viewing to conventional television is on the decline while the demand for specialty and pay services is on the rise, as viewers look for the more specialised, niche programming that these latter services offer.

Table 32 Distribution of English TV viewing by station group

Prime Time	1994-95	1995-96	1996-97 ⁽¹⁾	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05
All English TV Viewing	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Cdn. Conventional	56.4	56.0	55.2	51.7	48.4	48.2	47.1	44.5	42.4	44.0	43.2
US Conventional	25.5	24.8	23.9	20.6	19.8	19.0	17.1	15.3	14.0	13.2	13.2
Total Conventional	81.9	80.8	79.0	72.3	68.2	67.2	64.2	59.8	56.4	57.2	56.4
Cdn. Specialty	8.7	10.3	11.1	15.8	18.5	19.3	21.5	24.5	26.2	27.3	28.5
Foreign Specialty	5.8	5.8	6.7	9.5	10.9	11.0	11.2	11.8	12.5	11.2	11.6
Pay TV	3.5	3.1	3.2	2.4	2.4	2.4	3.1	3.8	4.9	4.3	3.7
Total Specialty/Pay	18.0	19.2	21.0	27.7	31.8	32.8	35.8	40.2	43.6	42.8	43.7

(1) Data not available for the 2-week period January 6-19, 1997

Source: Nielsen

(CBC/Radio-Canada – page 45)

135. The above table shows that Canadian conventional English-language television managed to attract just over 43% of the prime time viewing audience in 2004-2005. This is due in part to the simultaneous substitution requirement as, shown in the following table, the demand for Canadian English-language programming in prime time has actually declined, while the demand for US programming in prime time has increased.

Table 33 Distribution of English TV viewing by program origin

6AM to 2AM	2000-01	2002-03	2004-05 ⁽¹⁾
All Programs	100%	100%	100%
Canadian	34%	32%	31%
Foreign	66%	68%	69%
Prime Time	2000-01	2002-03	2004-05 ⁽¹⁾
All Programs	100%	100%	100%
Canadian	26%	25%	22%
Foreign	74%	75%	78%

(1) Estimates based on Canadian Television Fund data as reported by Nielsen.

Additional coding undertaken in order to minimize the level of uncoded viewing.

Source: Nielsen

(CBC/Radio-Canada – page 46)

136. In the case of French-language television, the situation is almost the reverse, as two-thirds of the programming broadcast during the broadcast day and in prime time is Canadian. This is due to the fact that the demand for French-language programming must be met, almost exclusively, by home-grown productions.

Table 34 Distribution of French TV viewing by program origin

6AM to 2AM	2000-01	2002-03	2004-05⁽¹⁾
All Programs	100%	100%	100%
Canadian	65%	66%	66%
Foreign	35%	34%	31%
Prime Time	2000-01	2002-03	2004-05⁽¹⁾
All Programs	100%	100%	100%
Canadian	62%	63%	65%
Foreign	38%	37%	33%

(1) Estimates based on Canadian Television Fund data as reported by Nielsen. Additional coding undertaken in order to minimize the level of uncoded viewing. Source: Nielsen (CBC/Radio-Canada – page 46)

137. With the advent of new platforms to access video content, such as VOD, video streaming on the Internet and video downloads, Canadians are getting used to the idea of being able to choose the type of video programming they want to watch, the service on which they want to watch it, as well as the time and place at which they want to watch it. This is illustrated by the following data provided by the CBC in its 2006 CBC/Radio Canada MTM study:

Table 35 New ways of accessing video content

	Anglophones 18+	Francophones 18+	Trend
Past month VOD usage	5%	4%	Emerging
PVR penetration	4%	2%	Emerging
Past month video streaming	17%	14%	Growing
Past month video downloading	11%	7%	Growing

Source: CBC/Radio-Canada's MTM, 2005 (CBC/Radio-Canada – page 47)

138. The CBC points out that VOD services are offered by all major cable BDUs to their digital subscribers, and that while VOD usage is still low among the overall population, usage among digital subscribers is significant. Rogers provided an example of this in its submission when it stated that it launched its VOD service in 2002 with fewer than 100,000 digital households and 100 titles, whereas today, this service is available to approximately one million digital households, with more than 3,000 titles. Rogers' current experience is that approximately 50% of its digital cable base is using VOD at some point each month.

C. How Canadians of different generations use various audio-visual technologies, and the impact that these different uses will have on the broadcasting system

1. Audio

a) Radio

139. As set out in section I, the total average weekly hours tuned to radio have remained relatively stable since 2000. However, AM radio has continued to decline in total average hours tuned, whereas FM has been recovering those hours through increased tuning. It appears for the most part that listeners are simply switching from AM to FM.
140. According to BBM data, 92.1% of Canadians aged 12+ listened to the radio for at least 15 minutes per week in Fall 2005, as compared to 94% in 1998.
141. Also in Fall 2005, the average hours tuned per listener was 20.7 hours per week, roughly the same number as in the previous year. The average hours tuned per capita decreased by roughly 25 minutes to 19.1 hours per week.
142. The average weekly hours tuned per capita declined in 2005 across all age groups. The largest decline over the 2000-2005 period was in the 18-24 age group at 2.9 hours per week, followed closely by the 25-34 year olds at 2.5 hours. The 55-64 age group had the smallest decline at 0.8%.
143. As mentioned earlier, the Commission contracted SRG to conduct a trend analysis on the topics raised by the OIC. With respect to the demographic trends for audio, SRG compiled the data in the table below.

Table 36 Distribution of Time Spent Listening to Radio by Demographics

	2003	2004	2005	2006
	%	%	%	%
Canada	24	21	20	21
Male	23	22	21	20
Female	24	21	20	21
12-14	13	13	13	10
15-19	13	13	13	12
20-29	20	20	17	18
30-49	25	24	23	23
50+	27	23	23	23

Source: Page 78 of the Fast Forward™ Trend Analysis prepared by SRG for CRTC – August 2006

144. The share of media time spent listening to radio by teens (12-19) is roughly half that spent by Canadians 30+. This is consistent with the Commission’s statistics as well as the ownership and music downloading results presented in the following two tables.

b) Music players

145. Table 29 shows that digital music player (iPod, MP3, etc.) ownership has jumped significantly among teens and young adults since 2003. Currently, ownership of these devices is highest among 12-19 year olds, which, coincidentally, is also the age group that listens to radio the fewest number of hours (see table 2.3).

c) Music downloads

Table 37 Change in the amount of time that Canadians download music from the Internet⁽¹⁾, in term of sex and age, 2000-2006

	2000	2003	2004	2005	2006
	%	%	%	%	%
Canada	20	29	22	25	29
Male	27	34	26	29	32
Female	12	24	18	21	26
12-14	32	62	43	52	55
15-19	36	74	63	59	69
20-29	29	40	34	42	42
30-49	15	18	11	16	20
50+	4	7	6	5	9

(1) Based on the percentage of Internet users in the last month

Source: Page 52 of Fast Forward™ Trend Analysis, prepared by SRG for CRTC – August 2006

146. Given the significant percentage of teens and young adults who own digital music players, it is not surprising that the amount of time they spend downloading music is also noticeably higher than the average for all Canadians, and tapers off markedly for Canadians 30+.

d) Music buying

Table 38 Change in Canadians' music buying habits in terms of sex and age, 1996-2006

	1996	1998	2000	2003	2004	2005	2006
	%	%	%	%	%	%	%
Canada	46	54	49	41	33	29	29
Male	50	59	53	41	32	32	31
Female	42	51	46	41	33	25	28
12-14	n/a	n/a	59	31	30	17	25
15-19	71	73	59	37	32	35	33
20-29	58	68	57	43	39	33	38
30-49	50	57	55	46	41	34	32
50+	46	39	35	36	24	22	22

Source: Page 66 of Fast Forward™ Trend Analysis, prepared by SRG for CRTC – August 2006

147. The above table shows that the decline in music buying (i.e., the percentage of Canadians who have purchased 4+ CDs in the six months preceding the survey) is not limited to a young “downloader” audience, but is seen with Canadians of all ages, which suggests a long-term downtrend in this type of activity.

e) Podcasts

Table 39 Change in the percentage of Canadian Internet users who downloaded a podcast within the last month, in terms of sex and age, 2005 and 2006

	2005	2006
	%	%
Canada	5	8
Male	6	9
Female	4	7
12-14	10	13
15-19	10	14
20-29	9	11
30-49	3	7
50+	2	2

Source: Page 53 of Fast Forward™ Trend Analysis, prepared by SRG for CRTC – August 2006

148. This table shows that there has been a slight increase in the downloading of podcasts from 2005 to 2006. As was noted with other types of Internet activity, the most active podcast “downloaders” are 12-19-year-old Canadians, with Canadians 30+ showing much less interest in this type of activity.

2. Video

a) Television

149. As set out in section I, the total average weekly hours tuned to television have also remained relatively stable. The viewing share of all conventional Canadian English- and French-language television services fell from 41.3% in 2002-2003 to 40.4% in 2004-2005. Conversely, the viewing share of all Canadian pay and specialty services rose from 32.6% in 2002-2003 to 36.9% in 2004-2005.
150. US conventional television and US pay/specialty services saw their shares of total Canadian viewing fall from 9.4% and 10.5%, respectively, in 2002-2003, to 7.7% and 8.7%, respectively, in 2004-2005.
151. Therefore, Canadian pay and specialty services are gaining viewers, whereas Canadian and US conventional services as well as US specialty services are losing viewership.

152. The average weekly hours tuned per capita increased in 2005 across all age groups. The largest increase in hours over the period 2002-2005 was in the 2-11 age group at 2.9 hours per week (1.8%), followed by the 12-17 year olds at 2.2 hours (1.3%). The 25-54 age group experienced the smallest increase at 0.4 hours, or 0.2%.
153. With respect to the demographic trends, SRG provided the data in the following table:

Table 40 Distribution of time spent watching television, in terms of sex and age, 2003-2006

	2003	2004	2005	2006
	%	%	%	%
Canada	26	26	24	24
Male	26	24	23	24
Female	27	27	25	24
12-14	20	19	19	18
15-19	18	16	15	15
20-29	20	19	16	18
30-49	25	24	22	22
50+	34	34	33	32

Source: Page 77 of Fast Forward™ Trend Analysis, prepared by SRG for CRTC – August 2006

154. The above table shows that 24% of the average Canadian’s media/leisure time was spent watching television in 2006, down from 26% in 2004. Among those in the 12-29 age group, the amount of time spent watching television has consistently been at or below the 20% mark.

b) Other television-related technologies

155. Ownership of DVD players continues its rapid rise. In 2006, 87% of Canadian households report having at least one DVD player, compared to only 7% in 2000.
156. Ownership of PVRs remains low – 6% in 2006, up from 4% in 2004 – due to it being a relatively new technology with a higher price point. Interest in owning a PVR does, however, remain high, at 55% in 2005. The greatest interest is among 12-19 year olds (76% to 82%), the group that heavily influences a family’s media technology purchases. In fact, the degree to which 12-19 year olds are “very interested” in this technology is almost twice as high as that of any other age group.
157. Ownership of video game consoles (such as Xbox or PlayStation 2) averages 44% of Canadian households in 2006, but jumps to 72% of households with 15-19 year olds, and 82% of households with 12-14 year olds.

3. Other audio-visual technologies

a) Personal computers and the Internet

158. The following table shows the change in access to a PC, from 2003 to 2006, in terms of sex and age.

Table 41 Percentage of Canadians living in households having 2 or more personal computers, from 2003 to 2006, by sex and age

	2003	2004	2005	2006
	%	%	%	%
Canada	21	24	30	32
Male	25	28	34	35
Female	17	20	27	28
12-14	35	35	42	49
15-19	35	44	56	53
20-29	23	26	31	36
30-49	21	28	31	36
50+	13	12	21	17

Source: Page 30 of Fast Forward™ Trend Analysis, prepared by SRG for CRTC – August 2006

159. Having two or more PCs serves as an indication of above average computer and Internet activity within the home. According to this table, there has been an increase in the number of households having at least two PCs for all age groups, with the exception of those 50+. Moreover, having two or more PCs is most common in households with teens.
160. The following table shows the age of PCs in Canadian households, based on the sex and age of the occupants, in 2006.

Table 42 Percentage of Canadians living in households with newer personal computers, and the average age of the computers in these households, 2006, by sex and age

	Canada	M	F	12-14	15-19	20-29	30-49	50+
	%	%	%	%	%	%	%	%
Less than 2	41	43	38	33	49	45	43	34
2 to less than 5	37	37	37	32	40	38	35	39
5 to 10	18	17	20	18	9	14	20	22
Don't Know	4	3	6	18	2	3	2	6
Average Age of PC	3.1	3	3.3	3.3	2.6	2.8	3.2	3.5

Source: Page 31 of Fast Forward™ Trend Analysis, prepared by SRG for CRTC – August 2006

161. This table shows that households with teens and young adults are most likely to have newer home computers. Newer generation computers are normally synonymous with the latest and fastest PC technology that is compatible with today's high memory/high bandwidth programs, games, downloading requirements, etc., which are typically used by 15-29 year olds.

162. The following table shows how much time Canadians of different ages spend using the Internet.

Table 43 Distribution of time spent using the Internet by Canadians, 2003-2006, by sex and age

	2003	2004	2005	2006
	%	%	%	%
Canada	11	13	15	15
Male	12	15	16	16
Female	10	12	14	14
12-14	18	19	18	21
15-19	17	20	22	22
20-29	14	17	18	18
30-49	13	15	17	16
50+	6	8	9	10

Source: Page 79 of *Fast Forward™ Trend Analysis*, prepared by SRG for CRTC – August 2006

163. Canadians in general currently spend 15% of their leisure time using the Internet, compared with 11% three years ago. Canadians under 20 years of age spend over 20% of their leisure time in this way.
164. The following table shows how many Canadians log on to the Internet at least once a week.

Table 44 Percentage of Canadians who use the Internet weekly (i.e. at least once a week), 1996 to 2006, by sex and age

	1996	1998	2000	2003	2004	2005	2006
	%	%	%	%	%	%	%
Canada	20	34	51	63	70	74	72
Male	25	40	56	65	73	77	74
Female	15	28	46	61	67	71	70
12-14	n.a.	n.a.	85	89	95	87	95
15-19	35	57	81	89	93	96	96
20-29	31	51	65	77	83	87	86
30-49	20	32	52	71	76	80	77
50+	9	20	30	39	48	53	51

Source: Page 34 of *Fast Forward™ Trend Analysis*, prepared by SRG for CRTC – August 2006

165. According to this table, almost all teens currently use the Internet at least once a week. Although weekly use tapers off for older age groups, over 50% of Canadians 50+ also use the Internet at least once a week.

b) Laptop computers (laptops)

166. The following table shows laptop ownership by Canadians.

Table 45 Percentage of Canadians who own at least one laptop, 2003 to 2005,¹⁸ by sex and age

	2003	2004	2005
	%	%	%
Canada	10	15	17
Male	13	17	19
Female	8	13	15
12-14	10	10	16
15-19	14	18	20
20-29	14	19	21
30-49	10	19	18
50+	8	9	13

Source: Page 43 of *Fast Forward™ Trend Analysis*, prepared by SRG for CRTC – August 2006

167. Although the highest level of laptop ownership (around 20%) is seen among 15-19, which typically includes students and “tech savvy” young business types, recent trends in laptop ownership support the notion that today’s consumer desires portability, wireless Internet capability, and the ability to view DVDs and play digital music remotely.

c) Cellular telephones (cell phones)

168. The following table shows changes in cell phone ownership among Canadians.

Table 46 Percentage of Canadians who own at least one cell phone, 2001 to 2006, by sex and age

	2001	2003	2004	2005	2006
	%	%	%	%	%
Canada	41	50	56	58	58
Male	44	53	58	58	61
Female	38	47	54	57	56
12-14	6	26	31	32	37
15-19	30	48	56	58	58
20-29	36	51	62	63	68
30-49	51	59	64	65	65
50+	37	43	48	50	50

Source: Page 46 of *Fast Forward™ Trend Analysis*, prepared by SRG for CRTC – August 2006

¹⁸ Data for 2006 was not available.

169. Between 2001 and 2005, growth in cell phone ownership among Canadians 12+ slowed somewhat, levelling off in 2006 with 58% of Canadians owning a cell phone. This translates into over 15 million cell phones in use in Canada in 2006.
170. Although teens showed the most dramatic increase in cell phone ownership from 2001 to 2006, it is the 20-49 year olds who show the greatest rate of ownership. This is important since there is a greater tendency for 20-49 years olds to have the disposable income to spend on this type of mobile audio and video technology.

d) Video (television) downloads

171. The following table looks at the downloading of television shows by Canadians.

Table 47 Percentage of Canadian Internet users who have downloaded a television show from the Internet within the month preceding the survey, 2005 and 2006, by sex and age

	2005	2006
	%	%
Canada	5	8
Male	7	10
Female	2	6
12-14	6	9
15-19	10	19
20-29	9	12
30-49	3	6
50+	2	4

Source: Page 55 of Fast Forward™ Trend Analysis, prepared by SRG for CRTC – August 2006

172. Among Internet users in the 15-29 age group, one in six (16%) downloaded a television show from the Internet.

e) Adaptation to technology

173. In a question that SRG asked respondents in 2005 as to whether or not, in their opinion, technology made their life simpler, younger Canadians were much more likely to say “yes”, which is not surprising given their tendency to be more at ease with technology when compared to older Canadians.

Table 48 Percentage of Canadians who *strongly agreed* and *agreed* with the statement, “Technology Makes my Life Simpler”, 2005, by age and sex

% “strongly agree” and “agree”	2005 %
Canada	56
Male	56
Female	55
12-14	74
15-19	74
20-29	60
30-49	53
50+	49

Source: Page 69 of *Fast Forward™ Trend Analysis*, prepared by SRG for CRTC – August 2006

174. Younger Canadians (12-19 year olds) as a group are much more likely to “strongly agree” and “agree,” while the 50+ group finds new technologies less helpful.
175. In response to a question asked by SRG, regarding the degree of difficulty associated with adapting to new technologies, Canadian respondents 50+ were much more likely to say that most technology is too complicated to use. Once again, younger Canadians (12-19 year olds) were the least likely to characterize new technologies in this way.

Table 49 Percentage of Canadians who *strongly agreed* and *agreed* with the statement, “I Find Most New Technology Too Complicated to Use” 2005, by age and sex

% “strongly agree” and “agree”	2005 %
Canada	39
Male	32
Female	46
12-14	20
15-19	23
20-29	32
30-49	41
50+	48

Source: Page 71 of *Fast Forward™ Trend Analysis*, prepared by SRG for CRTC – August 2006

176. In a study done for Bell, TELUS, Allstream and SaskTel (Bell et al.), *Youthography* conducted an online national technology survey of 9-29 year olds in July 2006.

177. When asked about the types of audio-visual technology they used:

- 78% - a DVD player
- 72% - a desktop computer
- 71% - high-speed Internet
- 53% - a digital camera
- 50% - a cell phone
- 50% - a portable MP3 player
- 45% - a portable CD player

178. When asked about the types of audio-visual technology they were *least* interested in:

- satellite radio - 49%
- satellite television - 42%
- PDA or smart phone - 41%
- VoIP - 37%
- digital cable - 32%
- Given youth's high level at technical savvy, a surprisingly large number of respondents were not familiar with VoIP (21%), PDA or smart phone (14%), or satellite radio (12%).

179. Only 6.9% of respondents reported that they did not watch television. The remainder accessed television programming as follows:

- cable - 50%
- digital cable - 29%
- DTH - 26%
- off-air - 12%.
- Of rural respondents, 50% had DTH, whereas 31% had cable service.

180. When asked about the other methods they used to access TV programming:

- Television series DVD - 59%
- downloaded online - 29%
- subscription to a PVR service - 21% (who also reported recording 2-3 shows per week)
- streaming from a website - 20%
- other handheld devices - 5%
- cell phones - 2%
- A total of 18% responded that they accessed their TV programming by no alternative methods, only watching it live on TV.

Of those reporting having downloaded TV shows online:

- 39% - did so rarely
- 17% - 1 or 2 times a year
- 13% - 1 or 2 times every 6 months
- 18% - 1 or 2 times per month
- 13% - once or more per week

181. When asked about future intentions as to how they will access TV programming:

- 79% - television
- 37% - downloading online
- 37% - television series on DVD
- 27% - streaming from a website
- 24% - other handheld devices
- 19% - cell phone.

182. When asked about their Internet use:

- they reported spending an average of 17 hours online a week.
- 54% reported downloading music
- 24% downloaded video
- 18% used streaming video
- 60% stated that they preferred the Internet to television, with half of those saying so because there was more content online reflecting their interests
- 34% agreed or strongly agreed that there was not enough Canadian-specific content on the Internet
- 20% agreed or strongly agreed that the government should be responsible for controlling/deciding what content is acceptable to access online, whereas 20% disagreed and 34% strongly disagreed
- 14% agreed or strongly agreed that their Internet service provider should be responsible for controlling/deciding what content is acceptable to access online, whereas 64% disagreed or strongly disagreed

183. When asked about what they wanted to be able to do on their cell phones:

- 42% - watch music videos
- 36% - watch news clips
- 29% - watch full movies
- 27% - watch full television shows
- 25% - watch television clips
- 25% - watch sports highlights
- 15% - all of the above.

184. A persistent theme in the SRG and *Youthography* research relates to the significant difference in the attitudes and behavior of people in the 12-29 age group compared to those over the age of 30, regarding media and technology. In this regard, the research indicates:

- The 12-29 generation is “always on”:
 - 75% use Instant Messaging vs. only 28% of those aged 30+
 - 70% with wireless use Short Message Service (text messaging) (SMS) vs. 25% of those aged 30+
- They are the new broadband generation: deeply engaged with the Internet – some say they ‘live on the Internet’ – downloading, surfing, consuming and creating content at rates much greater than older generations.
- They are more likely to be replacing traditional with new: only 31% of their media/leisure time is spent with television/radio, compared to 50% among those 30+.
- One implication of this generational chasm is that traditional assumptions about media use do not necessarily apply to younger generations. On-demand is now a consumer expectation and a frame of reference among younger Canadians. We believe that they will carry those “on-demand” expectations as they come of age and that this will have an impact on the choices they make in consuming media.
- At the same time that younger generations are shifting their behaviour, there has been little change in the media habits of older Canadians, those 30+. Our tracking is consistent with other research and indicates that the amount of time dedicated to television or radio has largely remained at consistent levels in the past ten years in older age groups, notwithstanding increasing time spent with the Internet.
- The large size of the boomer population in Canada today suggests that traditional “linear” media (generally the choice of older generations) will continue to co-exist with “on-demand” media (the choice of younger generations) in the medium term. It will take some time – about ten years – before today’s younger generation exerts its full influence as the dominant segment in the Canadian consumer landscape.

185. Finally, in one submission received, the following was proffered: “It would be a mistake to characterize the adoption of new technologies purely as a youth phenomenon. As these technologies become less expensive and easier to use, they will become mainstream choices for all generations. CTV cites a survey on generational uses of podcasting and a study of household online activities. According to the survey, Canadian baby-boomers are embracing podcasting at double the rate of those under 24. At the same time, however, there are generational differences in usage. Younger consumers spend more time online, and use instant messaging and blogs in greater numbers. But generational variation is very small for basic activities such as email, online shopping, and getting local news.”

D. A comparison between Canada and other countries of adoption rates for technologies

1. Digital Audio Broadcasting (DAB)

186. Digital audio broadcasting (DAB) is currently being introduced in many countries, including Canada, Europe and parts of Asia. It is based on the Eureka 147 standard worldwide, with the notable exception of the United States where digital radio uses a technology called In Band, On Channel (IBOC).

Australia

187. In October 2005, the Australian Minister for Communications, Information Technology and the Arts announced the adoption of a Eureka 147 system, but added that the Australian radio industry should investigate the use of newer audio compression technology that would allow more services to be broadcast in the available spectrum, which has been reserved in Band III and L-Band. The Australian Government has set 1 January 2009 as the launch date for digital radio in the country.

Austria

188. The national broadcasting company, ORF, is testing DAB in Vienna and in the province of Tirol.

Belgium

189. DAB was launched in Belgium in 1997. The transmitter network is comprehensive, resulting in excellent mobile coverage. Investments in new DAB services and more networks are expected, especially for the commercial and regional networks. An upgrade of the transmitter network for better indoor coverage is planned.

China

190. There is only limited service in Beijing and Guangdong.

Denmark

191. The country has rolled out an extensive DAB network with the goal of covering the entire country by 2007.

Finland

192. Finland switched off their DAB transmitters in 2005. Finland is now investigating the provision of digital radio via other digital broadcasting systems, such as Digital Video Broadcasting-Handheld (DVB-H).

France

193. The French communications regulator, CSA, has launched a technical forum to determine the standard for digital radio. The five largest French radio broadcasters are currently participating in a trial of the DVB-H and Terrestrial-Digital Multimedia Broadcasting (T-DMB) digital broadcasting system in Paris. T-DMB is a standard which evolved from DAB.

Germany

194. Regular Terrestrial-DAB (T-DAB) service was launched in April 1999, and licences have been granted to eight different network operators. They are obliged to construct their undertakings within a time frame of five to eight years. At present, about 85% of German households are located within the service area of T-DAB transmitter networks. However, the market penetration of receiver equipment is still low and several initiatives are underway in order to improve the situation.

Indonesia

195. Indonesia began DAB trial transmissions last summer with four DAB radio stations.

Ireland

196. There have been a number of test transmissions. However, DAB development has been limited by the lack of Band III frequencies. L-band allocations have recently been awarded to a number of local radio franchises.

Korea

197. On 1 December 2005, South Korea launched its T-DMB service, which includes both television and radio stations.

The Netherlands

198. Dutch Public Radio has been transmitting in Block 12C since 2004. Nine radio channels are available, including a non-stop Top 2000 channel and a continuous repetition of the last news bulletin. Territorial coverage of the Netherlands is currently limited.
199. In March 2005, the Dutch Minister of Economic Affairs announced that the government had postponed plans to push ahead with the roll out of DAB. Instead, it will assess certain new technologies which make more efficient use of the spectrum.

Norway

200. Several channels are available on DAB, including all of Norway's national broadcaster's (NRKs) broadcast channels and several of its niche services. There is also a private DAB broadcaster with a music channel. Some local radio stations are also licensed to broadcast via DAB. Coverage is currently being expanded to 80% of the population.
201. A government working group released a report on 19 December 2005, where it proposed that all FM distribution should be switched off by 2014, to be replaced by DAB, and by Digital Radio Mondiale (DRM) for smaller local radio channels.

Poland

202. In October 2001, test transmissions were resumed in Warsaw on DAB Block 10B. These facilities will form the first part of the single frequency network (SFN) covering central Poland.

Romania

203. As of Summer 2005, there is a single transmitter in Bucharest that broadcasts five radio stations multiplexed on channel 12A (223.9 MHz). Of the five digital radio stations, three are public and two are commercial.

Russian Federation

204. There are no T-DAB transmitters on air at the present time, but two licences for commercial T-DAB broadcasting services have been granted.

Singapore

205. MediaCorp's SmartRadio was launched on 19 November 1999 using the Eureka 147 DAB system. SmartRadio provides six digital-only stations and eight simulcast FM services, along with images and text to supplement the audio.

Sweden

206. On 14 December 2005 the country's Minister of Culture announced that the Swedish government was freezing investment in DAB. According to the Minister, DAB was very expensive to transmit and cheaper digital radio systems should be investigated, particularly transmission via the Internet and via the digital terrestrial television system. DAB transmissions continue, however, with coverage of Stockholm and other cities.

Switzerland

207. DAB service began in the north-eastern parts of Switzerland, followed by the central region. By the end of 2007, the entire German-speaking population should be within reach of one of the DAB stations. The remaining regions will be fitted out for DAB reception during the years 2007 to 2010.

United Kingdom

208. Experimental transmissions by the British Broadcasting Corporation (BBC) started in 1990, with permanent transmissions covering London in September 1995. Coverage has reached 85% of the population. Receivers are growing in availability; the £30 barrier was broken in 2006.
209. The BBC national DAB multiplex contains Radios 1-5, and a number of digital-only services. The Digital One national commercial multiplex contains eight audio stations, an electronic programming guide (EPG) and an experimental video service for mobile phones. Coverage of the latter is at 88% of the population. In addition to the national services, there are 48 local and regional radio multiplexes, providing over 250 commercial and 34 BBC stations.
210. UK broadcasters have used lower bit rates to increase the number of radio stations in each multiplex, leading to criticisms of reduced audio quality.

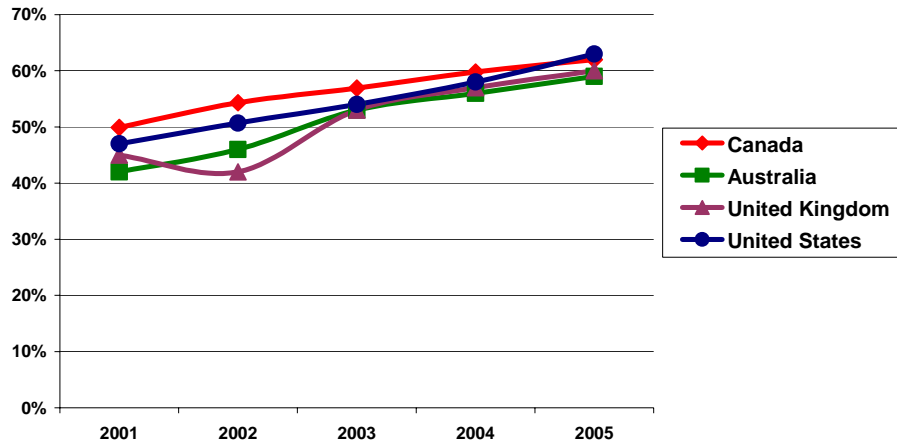
United States

211. Due to its unwillingness to assign suitable new domestic spectrum for the Eureka 147 system, the United States introduced digital radio in the current AM/FM radio broadcasting bands using IBOC.

2. Broadband/Internet

212. As stated by Communications Management Inc. (CMI) in its report prepared for this proceeding, the patterns of growth for home Internet access (e.g. dial-up, broadband) are quite similar across Canada, Australia, the UK and the US, with all having about 60% of households connected to the Internet in 2005.

Chart 12 - Percentage of households with Internet access in Canada, Australia, the United Kingdom, and the United States, 2001-2005



Sources: Statistics Canada; Australian Bureau of Statistics; Ofcom; MPAA; CMI
(For 2005, data for Australia are based on 2004-05; for the UK, data for 2005 are based on Q1 2006.)

(Page 26 of *Technology and broadcasting: Implications for public policy*, CMI, 1 September 2006, prepared for CanWest MediaWorks Inc. and CHUM Limited)

213. As included in the submissions by CanWest MediaWorks Inc. (CanWest), CCAU, OMDC and Canadian Conference of the Arts (CCA), the December 2005 OECD report showed that until 2003, Canada ranked second among OECD countries for broadband Internet. Mid-way through 2005, Canada fell to sixth place, and then to eighth by the end of 2005, when Iceland ranked first, Korea second and Netherlands third.

Table 50 Broadband subscribers per 100 inhabitants, by technology, December 2005

	DSL	Cable	Other	Total	Rank	Total Subscribers
Iceland	25.9	0.1	0.6	26.7	1	78,017
Korea	13.6	8.3	3.4	25.4	2	12,190,711
Netherlands	15.7	9.6	0	25.3	3	4,113,573
Denmark	15.3	7.2	2.5	25	4	1,350,415
Switzerland	14.7	8	0.4	23.1	5	1,725,446
Finland	19.5	2.8	0.1	22.5	6	1,174,200
Norway ⁽¹⁾	17.8	2.9	1.2	21.9	7	1,006,766
Canada	10.1	10.8	0.1	21.9	8	6,706,699
Sweden ⁽¹⁾	13.3	3.4	3.6	20.3	9	1,830,000
Belgium	11.3	7	0	18.3	10	1,902,739
Japan	11.3	2.5	3.8	17.6	11	22,515,091

Table 50 Broadband subscribers per 100 inhabitants, by technology, December 2005

	DSL	Cable	Other	Total	Rank	Total Subscribers
United States	6.5	9	1.3	16.8	12	49,391,060
United Kingdom	11.5	4.4	0	15.9	13	9,539,900
France	14.3	0.9	0	15.2	14	9,465,600
Luxembourg	13.3	1.6	0	14.9	15	67,357
Austria ⁽¹⁾	8.1	5.8	0.2	14.1	16	1,155,000
Australia	10.8	2.6	0.4	13.8	17	2,785,000
Germany	12.6	0.3	0.1	13	18	10,706,600
Italy	11.3	0	0.6	11.9	19	6,896,696
Spain	9.2	2.5	0.1	11.7	20	4,994,274
Portugal	6.6	4.9	0	11.5	21	1,212,034
New Zealand	7.3	0.4	0.4	8.1	22	331,000
Ireland	5	0.6	1.1	6.7	23	270,700
Czech Republic ⁽²⁾	3	1.4	2	6.4	24	650,000
Hungary	4.1	2.1	0.1	6.3	25	639,505
Slovak Republic	2	0.4	0.2	2.5	26	133,900
Poland	1.6	0.7	0.1	2.4	27	897,659
Mexico	1.5	0.6	0	2.2	28	2,304,520
Turkey	2.1	0	0	2.1	29	1,530,000
Greece	1.4	0	0	1.4	30	155,418
OECD	8.4	4.2	1	13.6		157,719,880

(1) Data are preliminary estimates.

(2) The OECD statistics for the "Other Broadband" category of the Czech Republic include a large number of fixed wireless broadband connections provided over mobile networks. Broadband subscriptions over 3G networks are not included for other countries but an exception was made for the Czech Republic because the connections make use of "fixed" equipment in a home and offer speeds greater than 256 kbps to individual users. The Czech market is particular due to the high number of these wireless broadband connections as a percentage of total connectivity. It is important to note that there is continuing debate in international circles as to whether this type of wireless connection (numbering 188 000 in the Czech Republic) should be included in international broadband comparisons.

214. Both the CanWest and Rogers' submissions pointed out, however, that the OECD ranked Canada in first place among G7 countries. Canada is well ahead of the US and, according to figures published by the OECD,¹⁹ has consistently been in the lead among the G7 countries for broadband penetration. Canada's broadband Internet penetration is 51% of households compared to 38% in the US²⁰ Forecasts suggest that, by 2010, Canadian penetration levels could reach 10 to 11 million households, a penetration rate of approximately 80%.²¹ This compares to 79 million households or 65%, by 2011 in the US²² and 40% of households in European countries by 2010.²³

¹⁹ OECD Broadband Statistics, December 2005.

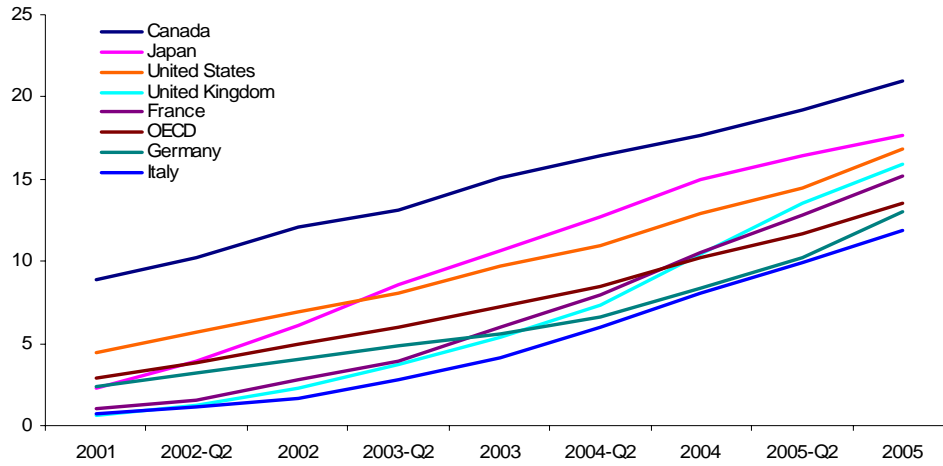
²⁰ FCC statistics for residential broadband access lines, released 26 July 2006.

²¹ PWC, "The Global Entertainment and Media Outlook: 2006–2010," June 2006.

²² Jupiter Research, 19 June 2006.

²³ Forecasts based on data released by Forrester Research, Inc., "Forrester Research Predicts That Broadband Will Hit 41% Of European Households By 2010," 19 January 2005.

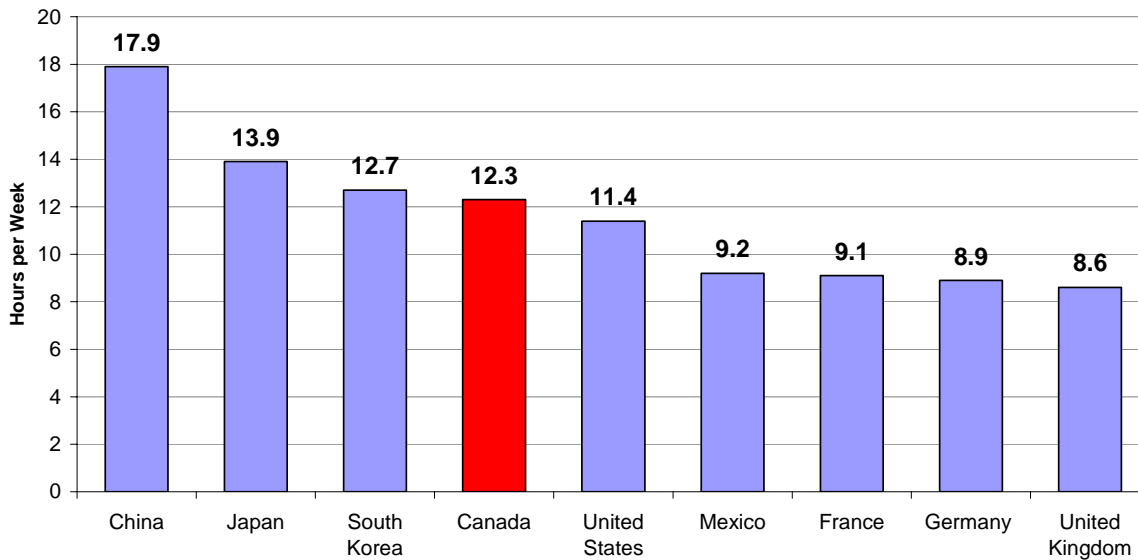
Chart 13 - Broadband Penetration in G7 Countries



Source: OBCD

215. According to OMDC, Canadians were also among the earliest users of the Internet, along with the United States and Sweden. Globally, the amount of time users spend on the Internet is relatively high in Canada and the United States. This is also true in Germany, Spain and South Korea. Canadians also rank high in terms of time spent using the Internet on a weekly basis.

Chart 14 - Internet use – time spent online



Source: Ipsos, "The Face of the Web," press release March 29, 2006.

216. According to CTV, consumers use broadband in different ways. The United States, along with the UK, lead the way in online commercial activities while Canadians, like the Chinese and South Koreans, are more likely to use broadband for entertainment activities such as playing games and downloading music and videos.²⁴
217. When it comes to online file swapping, the Canadian Recording Industry Association (CRIA) reports that Canada has the highest per capita rate in the Western world. In 2005, Canadian illegitimate downloads greatly outnumbered legal ones, accounting for over a billion pirated tracks. The monthly average of unauthorized downloads was well over 200 million in 2005 in Canada. Furthermore, from 2001 to 2005, music consumers increasingly used new technology to reproduce music contained on CDs. A recent study also found that software piracy rates in Canada are significantly higher (36%) than those of our major trading partners, such as the United States (21%) and the UK (27%), both of which have enacted digital copyright reforms.

3. Digital TV (DTV)

218. Digital TV (DTV) penetration in the United States is approximately 55%, compared to 45% in Canada. Some European countries are already far ahead of the United States and Canada, and analysts predict that all of Europe will overtake the United States with regard to DTV penetration by the end of 2010.²⁵
219. Regarding OTA DTV, according to an article referred to by the Union des artistes (UDA), the Association des producteurs de films et de télévision du Québec (APFTQ), The National Film Board (NFB) and Rogers, 1,566 off-air television stations in 211 markets in the US were delivering signals in digital format as of the end of August 2006. This represent 92% of all commercial and non-profit stations, which cover 99% of households in the United States.²⁶ The digital transition deadline in the United States is 17 February 2009, pushed along by up to \$1.5 billion being allocated by the United States Department of Commerce for a digital-to-analog converter box program.
220. According to the McEwen report and the OECD:
- The European Union's current proposals suggest that analog switch-off will take place in Europe between 2008 and 2015, with most countries ending analog terrestrial television around 2012.
 - France has a shut-off date in 2012 for its OTA analog television. There will be a multi-channel multiplex offering: 18 channels free to air and 10 pay services will be available. Digital signals presently cover about 65% of the country, and coverage is projected to rise to 85% by 2007. No OTA HD service is presently available and

²⁴ Forrester's Research, "North America, Europe, and Asia Pacific Consumer Technology Adoption Studies", April 2006

²⁵ Moore Carla, "Europe to surpass US in digital TV penetration by 2010", 28 July 2006,

<http://www.digitalmediaasia.com/default.asp?ArticleID=17088>

²⁶ National Association of Broadcasters website <http://www.nab.org>

none is currently planned for immediate OTA distribution. In border regions, there is a scarcity of available frequencies, which renders this digital transition necessary. In 2006, a fund of 15 million Euros was created to finance digital terminal equipment for television audiences situated in the coverage contour of each analog transmitter that will be shut down.

- In the UK, approximately 25.7 million households will see the shutdown of analog television in December 2012. The transition will take place over a four-year period between 2008 and 2012 on a region-by-region basis as a way to ensure that no household will be deprived of services. Up to 30 free services will be provided OTA, including pay services. Currently, no OTA HD is available, but it will be part of a future multiplex. Industry and government are jointly financing the promotion of the shut-off.
- Germany is the largest television market in Europe. It also has very few OTA viewers. Over 95% of Germany's 36 million television households with televisions receive their primary reception from cable or satellite. Less than 5% rely on terrestrial signals, and even factoring in households with second television sets, that figure rises only to about 12%. An analog shut-off date is planned for 2010, although it is likely to be earlier. Currently, OTA digital coverage extends to 60% of German households. There are up to 30 standard definition (SD) services on each multiplex, but no pay services are available. No OTA HD service is presently available and none is currently planned for immediate distribution. There have been some modest government subsidies to private broadcasters and consumers in the early part of the transition.
- Among European countries, the Netherlands has the earliest shut-off date for analog, firmly set for 2006. Finland is scheduled to shut off analog in 2007, followed by Sweden in 2008, Denmark and Norway in 2009, and Austria in 2010.
- The analog shut-off dates for Australia are targeted for 2010 to 2012. Currently over 85% of the population are within reach of a digital OTA signal. Analog channels will be duplicated in digital service in both SD and HD display. Also, according to the plan, each network will be obliged to provide 1,040 hours of HD programming. Pay and specialty channels are not part of the digital OTA offering and HD display on cable or satellite is yet to be considered.
- Mexico published its digital transition plan in 2005. Mexico has a long transition strategy beginning this year and ending in 2021. It is seen as a straight replacement technology for the existing services. The digital simulcast of analog will contain 80% HD content. No multi-channel service will be offered. There is no pay digital OTA service planned at this time.

- In Canada, the Commission has adopted a market-driven approach for the analog switch-off. Since 2002, 26 off-air digital television services have been licensed for the cities of Toronto, Montréal and Vancouver, but not all are in operation. As the Commission recognized in *Review of certain aspects of the regulatory framework for the over-the-air television*, Broadcasting Notice of Public Hearing 2006-5, 12 June 2006 (Notice of Public Hearing 2006-5), the pace of transition in Canada has been slow, particularly in comparison with the United States.

221. According to the McEwen report, Canada's market place approach has had some benefits. The industry decided a two-year lag behind the US roll out would save a great deal in early adoption costs for broadcast, production and consumer equipment. In fact, this has happened and Canada has enjoyed the benefits of that decision. This plan always assumed that when the United States became operationally viable with their digital OTA transmission services that the Canadian transition would begin in earnest. Canada has fallen further behind the United States and the two-year lag has turned into at least four years and maybe more.
222. According to the CCAU's submission, as of early 2006, HD broadcasts were available in 12 countries around the world: United States, Canada, Japan, Australia, South Korea, China, Germany, Austria, Sweden, Finland, Denmark and Norway. Mid-way through 2006, 15 million homes were tuning to HD worldwide, with penetration projected to reach 20.3 million by year-end. The United States and Japan have the greatest HDTV penetration of any countries, together accounting for 91% of the global market.²⁷ In the United States, by the end of 2005 there were 19 million households with HDTV sets (17% of total households), and 11 million of these were actually watching HD broadcasts either through HD decoders or off-air via built-in HD tuners. At the end of 2005, there were two million households with HD-ready televisions in Europe, and by 2010 it is predicted that there will be more than 50 million HD-ready television sets. Screen Digest predicts that by 2010 there will be approximately 100 HD channels available in Europe and that more than 11 million households will actually be watching television in HD.
223. Rogers stated that only about one-third or 650,000 of the Canadian households that own an HD television set subscribe to an HD service offered by a distributor, while more than half of US HD television set owners do. The following table provides figures on the number of HDTV sets in 2005 and forecast for 2010, for different countries worldwide.²⁸ Rogers suggests that this difference might be a result of the lack of HD content in Canada, which, in turn, may be related to the lack of an analog shut-off date.

²⁷ Webdale, Jonathan, "HD on track for 20 million homes", C21media.net, 15 August 2006, <http://www.c21media.net/news/detail.asp?area&article=31715>

²⁸ Informa Telecoms and Media report, September 2005, as summarized at: <http://www.dtg.org.uk/news/news.php?id=1131>

Table 51 HDTV-ready displays (in millions of units)

	2005	2010
United States	16.5	48.3
Japan	7.6	19.9
Canada	2.2	4.3
Europe	0.5	14.8
China	1.2	10
Australia	0.3	0.7
South Korea	0.3	3.6
Rest of world	0	4.60
Worldwide	28.6	106.2

(Rogers, Table E-1)

224. According to the submission by High Fidelity, Canada is also lagging behind in the production and delivery of HD programming to Canadians. In spite of the growing conversion of cable BDUs to digital and the advent of new technologies, most BDUs continue to frame their inability or unwillingness to carry new Canadian programming services in terms of bandwidth capacity.

4. Television viewing

225. North American consumers watch more television than Asian and European consumers. Average viewing hours per week were 25.1 in Canada, 19.0 in the United States, 17.3 in France and 18.0 in The United Kingdom.

5. Internet Protocol Television (IPTV)

226. According to submissions by the CCAU and Bell, North America is behind Europe and Asia in terms of IPTV implementation. Europe has a total of 700,000 subscribers to IPTV in comparison to 77,000 in Canada, although as a percentage of the respective populations, Canada does much better. MRG predicts worldwide IPTV subscriber penetration to increase from 3.7 million in 2005 to 36.9 million by 2009, with global IPTV service revenues rising from \$880 million in 2005 to \$9.9 billion by 2009.²⁹

6. Online music

227. CRIA states in its submission that the Canadian online music market is currently tracking at \$18 million annually, which is much less than the \$636 million US market. The gap between the Canadian and US markets in terms of the adoption of authorised music by consumers is vast, especially given the economic and technological similarities of the

²⁹ IP TV Global Forecast – 2005 to 2009: September 2005, MRG.

respective markets. Moreover, according to CRIA, Canada's lack of penetration of legitimate digital services is underscored by the fact that countries such as the UK, Germany, France and Italy, all of whom have significantly lower broadband penetration than Canada, are capturing considerably more revenues from the authorised download market.

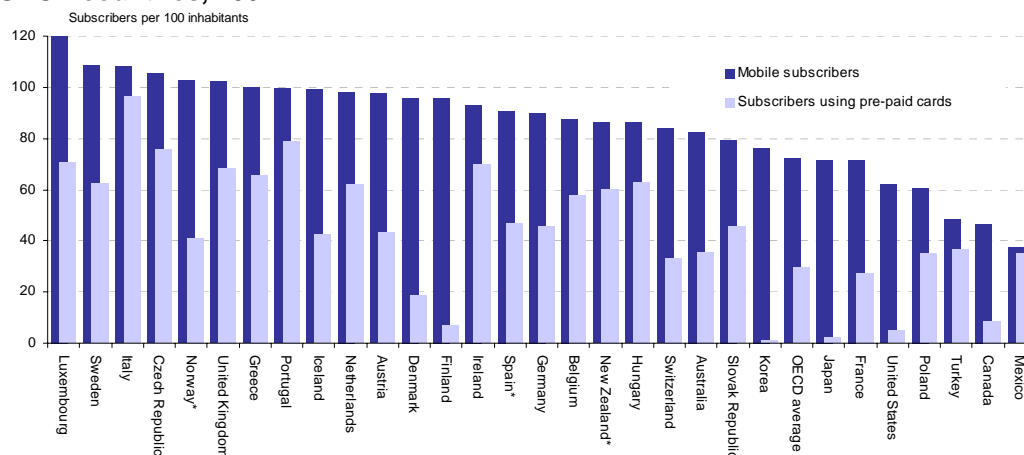
7. Satellite Radio

228. In their submission, the Association québécoise de l'industrie du disque, du spectacle et de la vidéo (ADISQ) stated that it is difficult to get an indisputable measurement of current satellite radio penetration because of various promotional programs and churn. It is understandable that forecasting take-up would be an even tougher call. Researchers estimate a range from 25 million to 52 million US subscribers in 2010 for satellite radio. These estimates represent between 7% and 15% of both households and vehicles in the United States.

8. Wireless/Cellular telephone

229. According to the CCAU, the Canadian Independent Record Production Association (CIRPA) and the OMDC, Canada has fallen far behind European countries in the implementation of wireless services and especially in the implementation of third-generation (3G) high-speed data services. To date, 3G rollout has only taken place in a limited way in a few large Canadian cities. For example, the CCAU stated that mobile phones have very high adoption rates in Japan (95%), France (85%), the UK (79%) and the United States (75%), as compared to Canada (61%). Although the lower rates in Canada can be attributed in part to this country's superior landline service and low cost, it is 3G technology that will enable Canadians to use their portable devices for accessing more and higher quality content, including television programming and video games.
230. The OECD published the following chart showing the number of mobile subscribers and the number of subscribers using pre-paid cards per 100 inhabitants in OECD countries in 2004.

Chart 15 Mobile subscribers and subscribers using pre-paid cards per 100 inhabitants in OECD countries, 2004



*Estimations
Source: OECD

231. This chart illustrates the differences in cell phone penetration among OECD countries and compares, for each country, the number of mobile subscribers with the number of subscribers who use pre-paid cards. This comparison is important because from a revenue standpoint, contract subscribers are generally more desirable to cell phone service providers than are subscribers using pre-paid cards. Service contracts generally attract subscribers who use their cell phones more often, given that having such a contract is more cost-effective for such subscribers. As well, when there is a contract, the service provider is guaranteed the revenue stream for the term of the contract. On the other hand, for occasional cell phone use, using pre-paid cards is more cost effective. However, for pre-paid cards, the service provider's revenue stream is generally lower, given that subscribers will tend to use their cell phones less. It is also certainly less predictable, given that some subscribers may not always renew their pre-paid cards.

9. Personal Video Recorders (PVRs)

232. Rogers provided data in their submission that PVRs have proven to be increasingly popular in the US. It is estimated that 13 million US households had a PVR at the end of 2005, equal to about 12% of all households.³⁰ The United States is by far the largest market internationally for PVR technology. At least one forecast suggests that more than 50 million US households could have a PVR by 2010, which is consistent with other forecasts suggesting a penetration level of 45%.³¹ As a percentage of households, survey findings suggest that Canada has a much lower PVR penetration level, about 6%. This is, however, higher than that in the UK and Europe. The data available for other countries is limited, but does suggest that North America and Japan are the two largest markets. In the UK, it is estimated that there were about one million PVR users at the end of 2005

³⁰ Forrester Research Inc. "The State of Consumer Technology Adoption," 13 June 2006; available at: www.forrester.com

³¹ Leitchman Research Group, Inc. "DVR and VOD Users and Usage Continue to Grow", press release, 27 July 2006; available at: <http://www.leitchmanresearch.com/press/072706release.html>

and at that time, the UK was considered a leader among European countries. A recent report released by Ofcom indicated that the number of subscribers in the UK with PVRs had reached 1.4 million as of the first quarter of 2006.³² It has been forecast that the level of penetration of PVRs in the UK could reach 20%, or 5 million homes by 2010.³³

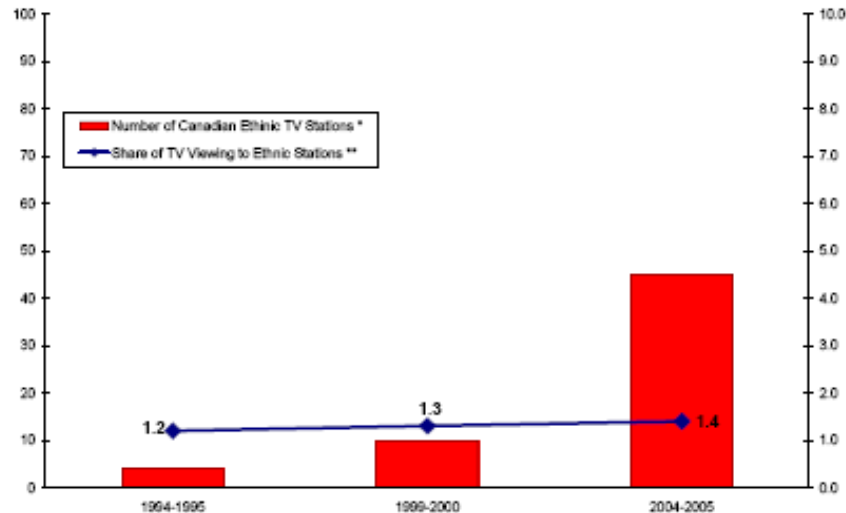
10. Digital consumer technologies

233. The adoption of digital consumer technologies is relatively high in Canada compared to many countries. In a survey of 14 countries, based on an index that measured the use of home networks, digital entertainment, consumer electronics, broadband and Internet services, Canada ranked fourth behind Taiwan, South Korea and the United States.³⁴

E. Demand for various types of programming and programming services by the Canadian population, taking into account the full diversity of Canadian society.

234. In the CBC's view, the increasing ethnic diversity of Canadian society is an important factor when looking at the future of television, as this increase has impacted the demand for third language/ethnic television channels. Ethnic language television stations have proliferated in the last decade, as shown in the following chart.

Chart 16 Share of total television captured by ethnic stations and the number of Canadian ethnic television stations broadcasting in Canada



* Based on the number of stations that received viewing captured by Nielsen for each respective year. Excludes non-Canadian services.

** Source: Nielsen

(CBC / Radio-Canada, page 6)

³² Ofcom, "The Communications Market 2006," 10 August 2006, page 189; available at: <http://www.ofcom.org.uk/research/om/>

³³ Opera Economic and Media Forecasts for 2006, November 2005; available at: <http://www.operamedia.net/pdfs/Economic%20and%20Forecast%20%202006%20Final.pdf>

³⁴ Parks Associates, June 2006

235. As of April 2006, there were 21 private commercial OTA ethnic radio stations authorised to broadcast in Canada, the majority located in Vancouver and Toronto. Toronto is now the most ethnically diverse city in the world, and Vancouver is not far behind. According to Statistics Canada, visible minorities represent about two-fifths of the population in each of these two cities. While the ratings data indicate that ethnic stations capture about 3% of total radio listening audience in Toronto and Vancouver, there is again a sense that this may be an underestimation of the popularity of such stations.
236. Changing ethnocultural demographics have provided support for the growing demand for the equitable, inclusive portrayal of ethnocultural and Aboriginal diversity on television. Under the Commission's licensing approach, Canada's ethnic broadcasting landscape has expanded considerably over the years. It currently includes four ethnic OTA television stations and 17 ethnic radio stations, all of which devote a significant portion of their schedules to third-language programming. There are also five general interest third-language specialty services that were approved under the analog licensing framework.
237. In addition to the third-language ethnic broadcasting services noted above, 26 Category 2 ethnic specialty services licensed for digital distribution have now been launched, as have several specialty audio services. A further 126 Category 2 ethnic digital services have received authorisation, but have not commenced operations.
238. There are 23 third-language, non-Canadian services that, to date, have been authorised for distribution in Canada. Six of them are currently offered by Canadian broadcasting distribution undertakings.
239. Several community cable channels also provide multilingual programming relevant to the local demographics they serve. As a result, viewers in every part of the country can now receive programming in well over 40 languages.
240. Over 15 Subsidiary Communications Multiplex Operations (SCMO) services (auxiliary radio on the FM band) in various languages are available in various cities. Multilingual programming is also available in many cities, on various campus and community radio stations. Several of the above radio and SCMO services are also available as cable and satellite "audio services".
241. The Commission also licenses Aboriginal services. Aboriginal Peoples Television Network (APTN), launched in 1999, is the only national Indigenous television network in the world. It is required to be carried by all BDUs, making it a service available to all Canadians, both Aboriginal and non-Aboriginal. It is run by Aboriginal peoples with an aim to reflect Aboriginal concerns and the diversity within their cultures to all Canadians, in many languages.

242. Native Communications Inc. serves Manitoba with a province wide network of Aboriginal radio stations. As of 2004, it serves approximately 95% of Manitoba.
243. Aboriginal Voices Radio Network was launched in Toronto in 2002. It is designed to be a national urban network in the larger cities. It has eight licences for cities across the country.
244. Today, there are over 250 native radio stations across the country in rural areas, small towns and reserves. In order to encourage the roll-out of as many services as possible, most are exempt from the regular licensing process.
245. The Commission also licenses religious programming services. Vision TV, for example, is a multi-faith, multicultural specialty service that has been in operation since 1987 and is carried by most BDUs. It provides interfaith, religious programming that is related to, inspired by, or arises from persons' spirituality, including related moral or ethical issues. It serves approximately ten world religions primarily in English, in addition to some other languages.
246. To date there are 29 spoken word and Christian music religious radio stations across Canada. In addition, four religious conventional OTA television stations have been licensed in Vancouver, Lethbridge, Winnipeg and Toronto/Hamilton. While primarily Christian, they are also required to provide programming that reflects other religious perspectives.

F. How future generations will consume or access content, programming, and programming services

247. According to the *Youthography* research study provided by Bell et al., young and future generations are looking to access programming services and their video content via alternative distribution platforms. These platforms are now unfolding and will complement the traditional broadcast model for some time to come. Programming of short or “clip” duration (standalone news, sports highlights, etc.) has no natural home on the traditional broadcast model, but is particularly well-suited to the “anytime, any place, any device” distribution capabilities of the Internet, which in turn also serves both broadband video and wireless mobile video. Canadians will consume traditional video content on a time-and-place-shifted basis, and format-shifted video content on a traditional basis.

248. The CBC maintains that:

- as technologies continue to evolve, there will likely be an increasing demand for “on-demand” services. However, it also seems likely that there will be an on-going role for traditional broadcasting entities providing scheduled content.
- despite the myriad of new technologies allowing on-demand access to video content, it is expected that both radio and television will remain a key component of the Canadian broadcasting system. While viewing to conventional television has steadily decreased as more Canadian specialty services have come on stream, the general interest programming offered by conventional television still attracts a major audience share in both anglophone and francophone markets.
- new audio platforms represent a significant challenge to traditional OTA. The wide array of new platforms has increased audience fragmentation, decreased the visibility of any single audio service and successfully attracted a significant portion of the younger demographic. It is no longer a case of one size fits all. Audio programs will have to be carefully designed and targeted to the appropriate platforms, and it is critical for Canadian broadcasters to be present on as many audio platforms as possible as this is where future generations of young Canadians will access and consume their audio and video programming.
- as the research indicates, a significant segment of the Canadian population (18-34 year olds) has strongly embraced the new ways of accessing video and audio content. Older Canadians (39+), on the other hand, have been much more reticent to accept these new on-demand technologies, and it is this segment of the population that typically represents the heaviest users of television and radio, and is likely to remain a strong supporter of traditional media. As the population ages and the demographic of the country shifts to this older age group, it appears likely that television viewing and radio listening will continue to attract good audience numbers, particularly amongst this segment of the population.

249. As stated in their survey, SRG “anticipate on-demand use via the cable or DTH platform (e.g., PVR or VOD) to increase in the next five years to the 30% range of all Canadian households.”³⁵

250. Other parties who submitted comments noted that current consumers, and most likely future generations as well, increasingly want to personalize and customize their programming content. The development and availability of new forms of technology, such as wireless and mobile devices, PVRs, the Internet and on-demand services, allow consumers to create their own programming and customize their viewing habits. New platforms also offer viewers more choices in regards to how they access their programming content and better accessibility to different types of programming content.

³⁵ *Fast Forward Trend Analysis*, SRG, August 2006, p.86

251. Therefore, the Internet, as well as wireless and mobile devices represent new means by which users can access their programming content. However, the comments submitted point towards a belief that even though the use of these new platforms will most likely increase from generation to generation, new platforms will not necessarily represent a replacement of traditional television viewing, but will serve as a complementary means to access programming content.
252. SRG further stated that “the large size of the boomer population in Canada today [...] suggests traditional ‘linear’ media (generally the choice of older generations) will continue to co-exist with on-demand media (the choice of younger generations) in the medium term. It will take some time – about 10 years – before today’s young generation exerts its full influence as the dominant segment in the Canadian consumer landscape.”³⁶

G. Impact of the evolution of audio-visual technologies on content and programming choices available to Canadians

253. The following comments regarding the impact of the evolution of audio-visual technologies on content and programming choices available to Canadians, including local, regional, national and international content, were submitted to the Commission by various parties.
- The Society of Composers, Authors and Music Publishers of Canada (SOCAN) maintained that the lack of regulation requiring the new technologies to provide any Canadian content is actually resulting in Canadians having fewer Canadian programming choices available to them when they use these new technologies than when they access conventional television and radio stations.
 - The Canadian Broadcasting Corporation (CBC) maintained that the increase in the number of platforms and in the carriage capacity of individual platforms means that the diversity of programming available to Canadians is likely to continue to expand. Given the underlying economics of program production, this suggests that national and international programming is likely to increase in visibility and availability, while the relative amount and visibility of local and regional programming will decrease.

³⁶ *Fast Forward Trend Analysis*, SRG, August 2006, p.93

- The CBC also stated that the multiplication of new platforms and the increase in their carriage capacity will probably diversify programming in the future. As well, Canwest MediaWorks Inc. (CanWest) added that new technologies, such as the PVR, allow time-shifting of television programs and have the potential to make it easier to send or receive television programs over the Internet, to skip commercials or to allow alternative commercials or commercial extensions. They also stated that new technology erodes borders between media of different types, between media and advertisers and between media and consumers.
- The Canadian Film and Television Production Association (CFTPA) stated that Canadian television broadcasters will need to provide greater support for, and assume a greater portion of the risk in the financing of independently produced Canadian programming. They also added that producers must recognize television broadcasters' need to acquire sufficient exclusivity across a variety of platforms so as to ensure that they may continue to deliver distinctive programming to large audiences. The CFTPA also encouraged the government to take steps to stimulate production of Canadian content for new digital platforms and ensure a predominant place for this content on these new platforms. If adequate funding is not made available, the CFTPA stated that both unregulated and regulated new digital platforms will increasingly be filled by foreign (namely US) content.
- The Alliance of Canadian Cinema, Television and Radio Artists (ACTRA) and the Communications, Energy and Paperworks Union of Canada (CEP) argued that Canadians must have access to their own culture and the means to express their national identity. The CEP added that ownership of new technology poses the greatest threat to content and programming choices available to Canadians, particularly at a local level. Although new technology has lowered production costs, local production continues to be abandoned, with cuts even to local news. Technology has allowed centralization of master control and other production facilities, as well as less expensive shooting, editing, etc. Such cost-saving, however, has not led to more local output or to more Canadian drama. The CEP feared that arguments about new technology are being used as excuses to abandon Canadian programming obligations.
- Cogeco Inc. (Cogeco) stated that some of the trends that impact audio-visual content production include: the globalization and localization of content; the growing active participation of consumers, particularly younger people, in the creation, presentation and distribution of online content; users filtering content for their own needs; format shifting; and creation of new formats.

- The Canadian Conference for the Arts (CCA) indicated that it is unclear whether Canadians will continue to have access to Canadian content, as previously provided by licensed broadcasting undertakings, because of the emergence of new platforms and distribution technologies. They added that the pay-for-performance system advocated by distributors, in relation to Internet speed and carriage capacity, will reduce users' access to the Internet, limit the development of the new content that draws people online, and reduce overall innovation. They also argued that an ongoing challenge that continues to exist is the lack of adequate and stable funding to support the availability of Canadian content.
- The Canadian Cable Systems Alliance Inc. (CCSA) indicated that in smaller communities, such as most of those served by CCSA members, conventional broadcasters are providing less and less local programming and more and more regional programming. Community channels offered by cable BDUs are frequently the only local television stations in smaller communities and are often the only local source, other than radio, of broadcasting information for such communities.
- The Union des Artistes (UDA) stated that large-scale cost-saving measures in the production and distribution of audio-visual content favour the production and broadcasting of national and international content (specifically content produced by larger countries) over local and regional content – whether distributed via new platforms or more traditional media. The Commissioner of Official Languages added that new technologies, whether they are satellite radio or mobile devices, allow all Canadians to access the same programming. Consequently, broadcasters tend to choose programming of national and international nature and, therefore, to not broadcast local and regional programming on a priority basis.
- The UDA also indicated that the power, flexibility and mobility permitted by the new audio-visual digital devices favours the use of audio-visual content in a more and more specialised and personalized way. For example, the Internet, whether the connection be by computer, iPod or cell phone, allows better access to international, national, regional and local content.
- The Canadian Association of Broadcasters (CAB) stated that small market stations are particularly vulnerable to the impact of competition, whether from within their markets through newly licensed radio stations, or out-of-market through new audio platforms within the parallel audio system such as satellite/subscription radio, or any other commercially available media. They added that the challenges experienced by small market radio will escalate over the next several years as new and emerging competitive audio distribution platforms become more widely available.
- The National Film Board of Canada (NFB) stated that the universal nature of digital media favours the globalization of audio-visual production, distribution and public access by Canadians. In the new communications-based world of tomorrow, governments must find ways to provide more financing to underwrite research, development and production of new audio-visual technologies so as to ensure

Canada's relevance in the new information-based economy. The New Media Business Alliance (NMBA) added that there has been no marked improvement in the visibility and availability of Canadian content on the Internet relative to the amount and popularity of content available from foreign competitors.

- CTV Television Inc. (CTV) indicated that consumers and the new centre of power, acting as creators, programmers, aggregators and distributors. This represents a seismic shift to user-driven content and distribution, whether on television or other platforms. As a result, new notions of community are created – locally, regionally and internationally – where consumers share their stories and content with others – broadcasting without borders. Shaw Communications Inc. (Shaw) raised the concern of consumers creating their own content. They indicated that new technologies allow Canadians to create their own content, become their own broadcasters and bypass the Canadian broadcasting system.
- Bell Canada (Bell) noted that there has been an explosive growth in online video streams. As well, the Internet, because of its on-demand nature, searchability and capacity for storing large amounts of digital content economically, has a unique role in delivering content whose distribution is not feasible through traditional channels. These online channels complement a broadcasting network's regular programming. Bell added that the Internet is a medium that fosters community and the submission of user-generated content. User-generated video platforms also allow independent producers and creators to use them in order to find an audience for their products.
- Saskatchewan Telecommunications (SaskTel) commented that recent research indicates that consumers are seeking out new content and using it in more sophisticated ways than in the past. As Canadians are consuming more digital content on an increasing number of sophisticated devices and technologies, and are staying abreast of new technology developments, they are poised to consume even more. This slow but steady trend is being fuelled by infrastructure upgrades providing greater bandwidth speeds and capacity and burgeoning service experimentation.
- Rogers Cable Communications Inc. (Rogers) also expressed the view that the new media model will be based, in part, on viewers' time-shift and place-shift content from on-demand platforms, on consumers who pay only for content downloaded or ordered from VOD, and on advertisers who pay for targeted and measurable audiences and leads.

254. The submitted comments concerning the impact that the evolution of technologies will have on content available to Canadians indicate that there are different views on how this evolution will affect programming choices, including local, regional, national and international content. A first impact of this evolution relates to the fragmentation of programming services and the diversification of programming. A second impact relates to the erosion of traditional borders that affect the amount of local, regional, national and international programming that is broadcast.

255. Some who submitted comments stated that the evolution of audio-visual technologies will allow for a greater diversification of programming and permit consumers to access a wider variety of content through different media of distribution. They argued that the multiplication of new platforms, such as the Internet, mobile devices and PVRs, will diversify programming and allow consumers to personalize and customize their own programming content and to share this content through various and simultaneous media platforms. These new platforms will not replace existing technologies, but will complement them. Nevertheless, they will have a negative impact on the use of existing technologies.
256. However, one of the consequences of this diversification, as expressed in the comments submitted, is that it allows consumers to become their own distributors and creators of their own content, thus bypassing the Canadian broadcasting industry.
257. The second impact regarding the effect that the evolution of technologies will have on programming and content relates to the globalization of programming and the decrease in local/regional content versus an increase in national/international content. Several parties expressed this concern over this impact in their submissions.
258. These parties expressed agreement that the current regulatory environment ensures that local programming is made available to Canadians (it should be noted that local programming consists largely of local news). However, due to the emergence of a wide variety of new platforms that allow consumers to personalize, customize and distribute their own programming, local and regional programming may be on the decline. Since consumers become creators and distributors, new notions of community are created where users share and view each other's content. The report published by CMI noted that "another consequence for broadcasting is that fragmentation makes it more difficult to do local programming," because diversification produces specialised services that "take audiences and revenues away from the local general services that previously offered some of the same types of programs."³⁷ For example, the increased use of the Internet as a means to obtain content compromises the availability and visibility of local programming in favour of national/international content. As mentioned in the SRG report, "one in three Canadian Internet users actively downloads content (music files, podcasts, TV shows or full-length movies in the last month - 2006). This figure more than doubles in the 15-19 age group (73%)."³⁸
259. It should be noted that the Commission is addressing the issue of local programming in its review of certain aspects of the regulatory framework for OTA television³⁹ and that a more detailed analysis should be available at the end of this process.

³⁷ *Technology and broadcasting: Implications for public policy*, CMI, 1 September 2006, p. 32

³⁸ *Fast Forward Trend Analysis*, SRG, August 2006, p. 55

³⁹ *Review of certain aspects of the regulations framework for over-the-air television*, Broadcasting Notice of Public Hearing 2006-5, 12 June 2006

Section III: Impact on the broadcasting system

A. Adoption of technologies by broadcasting undertakings since 1 January 2000

260. Driven by technological advancements, the Canadian broadcasting environment and the technologies upon which it operates have changed and expanded during the last decade. New platforms and technologies have been developed in the areas of audio and video broadcasting and reception, digital radio and television, pay audio, satellite radio, wireless broadcast and telecom services, DTH, mobile wireless, the Internet, audio and video streaming, podcasting, audio and video downloading, VOD, PVRs, and more.
261. The following two tables illustrate the technology changes in both the video and audio environments during the last decade:

Table 52 Illustration of Multi-Platform Growth –Video

1995	2000	2005
<u>TV Distribution</u>	<u>TV Distribution</u>	<u>TV Distribution</u>
•Over-the-air TV	•Over-the-air TV	•Over-the-air TV
•Analog Cable	•Analog Cable	•Analog Cable
	•Digital Cable	•Digital Cable
	•DTH Satellite	•DTH Satellite
<u>Personalization</u>	<u>Personalization</u>	•Wireless Cable (MDS)
•VCR	•VCR	•IPTV
•Specialty TV	•Specialty TV	•Internet
•Pay TV	•Pay TV	
	•DVD Player	<u>Personalization</u>
	•PPV	•VCR
		•Specialty TV
	<u>Portable</u>	•Pay TV
	•DVD Player	•DVD Player
		•PPV
		•PVR
		•VOD
		•Video Downloads
		•Video Streaming
		<u>Portable</u>
		•DVD Player
		•Digital Video Player
		•Mobile Phone
		•Laptop Computer

Source: CBC / Radio-Canada, page 14

Table 53 Illustration of Multi-Platform Growth –Audio

1995	2000	2005
<u>Distribution</u>	<u>Distribution</u>	<u>Distribution</u>
•Radio	•Radio	•Radio
	•Audio Player	•Internet
		•Satellite Radio
<u>On-demand</u>	<u>On-demand</u>	<u>On-demand</u>
•Tapes	•Tapes	•CDs
•CDs	•CDs	•Music downloads
	•Music downloads	•Streaming Audio
<u>Portable</u>	<u>Portable</u>	<u>Portable</u>
•Walkman	•Walkman	•Podcasting
	•Digital Audio Player	•Walkman
		•Digital Audio Player
		•Mobile Phone

Source: CBC / Radio-Canada, page 24

262. Faced with these new platforms, some regulated, some not, and the certain prospect of more in the future, broadcasters have had to change their business models in order to remain competitive. Licensed broadcasters are taking steps to access new digital platforms with their own content so as to establish a presence in the unregulated broadband spaces. In this regard, a number of Canadian broadcasters have already adopted or are in the process of adopting the new technologies, including:

- Radio undertakings now routinely broadcast their programming on the Internet.
- Satellite radio has been launched.
- A number of radio undertakings are now providing podcasts to their listeners.
- Conventional television undertakings have transitioned, or are in the process of transitioning, to digital as licences have been issued to a number of stations in major markets.

263. These undertakings, along with the specialty services, are commissioning and broadcasting more and more HDTV programming. The CBC currently produces all of its audio and video programming in digital. CTV Television Inc. has also invested in HD programming and indicated that most of its acquired programming is currently in HD and the transmitters of both CFTO-TV Toronto and CIVT-TV Vancouver have been upgraded for HDTV.

- Independent producers have started to produce programming in HDTV in a variety of formats so that it has multi-platform appeal.

- Broadcasters are starting to make their programming available on as many platforms as possible whether it is on-line, VOD, or mobile television, to address the audience fragmentation caused by these new technologies and to ensure that their product is accessible to as many viewers as possible.
 - DTH is all-digital and the cable industry is rapidly approaching that capability.
264. In August 2005, Bell, Rogers and TELUS began offering mobile television services. Some programs are streamed live to the handset while others consist of pre-recorded content downloaded to the handset of a host server. In August 2006, there were 11 licensed Canadian broadcasters making programming available on the mobile television services of all three mobile phone carriers.
265. Rogers and CanWest have announced a new service to offer CanWest content to customers of Rogers Wireless Inc. via BlackBerries.
266. A number of Canadian broadcasters have created their own websites to promote and brand their programming, increase their advertising revenues and attract viewers back to the programming of their conventional and/or specialty services. For example:
- CTV is currently broadcasting television programming as well as providing customized offerings over the Internet. Viewers have access to both full-length television shows and to unique content. CTV also offers on-demand video clips of top stories and paid live Internet streaming of its CTV Newsnet channel.
 - Corus Entertainment Inc. has announced that many of its programs directed to children will be available on a number of platforms.
 - CHUM partnered with yahoo.ca to offer on-demand access to certain of its shows and added Mobisodes of 12 of its shows.
 - In March 2006, two of the top 20 websites visited by Canadians were those of the Weather Network with 4.4 million visitors (18th) and the CBC (20th) with 4.2 million visitors (as measured by the total number of unique visitors). The top news and information websites include many Canadian broadcasters' sites. Ten of the top 23 sites were those of Canadian broadcasters: The Weather Network, Météomédia, CBC, SRC, CTV, TSN, TQS, RDS, MuchMusic and Teletoon.

B. The economic and regulatory impact of new technologies on the broadcasting system

267. In the CBC's view the primary economic impact of the new technologies relates to the increase in programming choices available to consumers and consequent audience fragmentation. While the overall revenues of the broadcasting industry have increased, audience fragmentation has put significant financial pressures on some sectors. In particular, audience fragmentation has put in considerable doubt the ongoing viability of

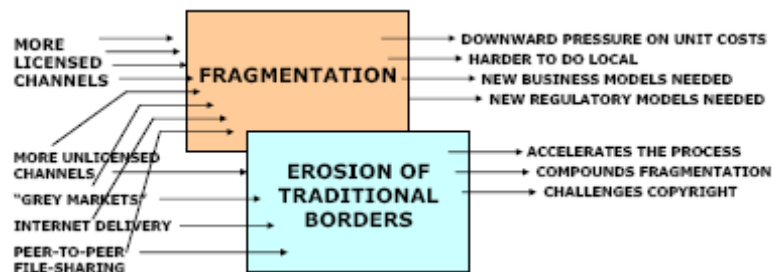
the advertising model used by conventional television. All broadcasters will need to be able to rely on multiple revenue streams in order to maintain their financial health in the new environment.

268. According to the CMI study commissioned by CanWest and CHUM Limited, the economic and regulatory impact of technologies on the Canadian broadcasting system includes:

1. Fragmentation and the erosion of borders:

269. Fragmentation and the erosion of borders are the two technology factors that currently have the largest impact on broadcasting. Fragmentation is the result of more channels from more places on more devices.
270. Erosion of borders refers not only to the erosion of geographic borders which comes with the ability of consumers to access content from virtually around the world, but also to the erosion of borders between media of different types such as websites of print media carrying audio or video features, between media and consumers, or between media and advertisers, such as the “Go Beyond” broadband channel launched by Land Rover, featuring original programming in sport, lifestyles and popular culture.
271. The following chart provides a graphic representation of the impact of new technology on the Canadian broadcasting system.

Chart 17 – Fragmentation and the erosion of border have a compounding effect on media:



Source: Page 29 of *Technology and broadcasting: Implications for public policy*, CMI, 1 September 2006, prepared for CanWest and CHUM

2. Copyright challenges:

272. As a result of the borderless nature of new technologies, exclusive program rights on a territorial basis are becoming more difficult to acquire and to protect – thereby threatening the integrity of the Canadian program rights market. New technologies have changed the previously stable marketplace for program rights. Producers see the “ancillary rights” associated with new platforms – VOD, Mobile, Internet, etc. – as new revenue centres and seek to sell them off separately, or at least, receive incremental licence fees. For example, in today’s environment, US producers and rights holders can reach Canadian consumers directly via unregulated Internet and mobile platforms rather

than through a Canadian broadcaster “middleman”. This bypass of Canadian broadcasters may result in a breakdown of the Canadian rights market and may significantly erode support for Canadian content by eroding the cross-subsidy essential to its support, at least in the English market.

3. Downward pressure on unit costs in fragmented markets:

273. As a result of fragmentation, broadcasters are faced with increasing pressure to reduce their unit costs. In television, for example, one of the consequences of this downward pressure is that fragmentation makes it more difficult, and riskier to invest in high-quality drama programs. Fragmentation also makes it more difficult to produce local programming. This is compounded when the new, fragmented services are also specialised services, which take audiences and revenues away from the local general services that previously offered some of the same types of programs. The fragmentation of media markets makes it more difficult for local or even national broadcasters to produce content that will continue to attract large audiences.

4. Changes in audience measurement and media buying:

274. As technology changes the nature of media, it is also changing the way that media are measured, and the way advertising is purchased. For many years, audiences for both radio and television were measured by having a sample of consumers fill out diaries that recorded what they listened to or watched. For television, diaries have given way to meters, and for both radio and television, more advanced “portable people meters” (PPMs) are on the horizon. In Canada, BBM has already begun to use PPMs to measure radio audiences. In the US, Nielsen has announced plans to use its technology to provide television ratings data for commercials, which may replace television program ratings as the currency for buying television commercials. Digital set-top boxes and PVRs also have data-tracking capabilities. In five or 10 years, it is possible that audience measurement devices may be linked with radio frequency identification tags in consumer products. These changes in measurement, and the kinds of data that will be produced, will change the way advertising is purchased, with a potential impact on all media.
275. The impact of technological change also extends to the process of buying advertising. For example, there are signs of some early moves toward multiplexing commercials, so that advertisements may be targeted directly at the consumers most likely to be interested in the product or the offer. Consumers may be watching the same television program, but would see different commercials, based on their demographics, location, or expressed interests.

5. Pressure on traditional concepts of scheduling and bundling:

276. In the television industry of the last five decades, broadcasters sought to take advantage of their ability to schedule and bundle programs, in order to maximize audiences and advertising revenues. The ability to schedule and bundle in that way is increasingly

challenged by fragmentation, by the ability of viewers to watch programs other than at the time they are broadcast by recording, downloading or purchasing the program on DVD, by the fact that many programs are available on a VOD basis, and by the fact that more and more consumers now use electronic program guides and the Internet as sources of information about what to watch.

277. For television broadcasters in Canada, this changes their ability to attract audiences to programs, in part because of the fragmented ways in which audiences now learn about and choose to watch programs, and in part because television broadcasters may not always control the rights to exhibit a given program in all of the different ways possible.
278. With regard to the economic and regulatory impact of new technologies, the CAB stated that:
- The proliferation of platforms and the drive to greater choice has created a level of fragmentation that may make it difficult for broadcasters to afford quality professional content, certainly for the Canadian domestic market, unless they are able to reintegrate audiences across all platforms.
 - The ability of existing and new technologies to disrupt the territorial segmentation of rights demands a new approach to revenue models. One example is the severely reduced ability of local television broadcasters to monetize the program rights they have acquired for their markets when out-of-market signals devalue those rights.
 - Today, both the producer and the broadcaster are acutely aware that the technology-driven, changing environment is fundamentally altering the once relatively stable marketplace for program rights. The producer sees “ancillary rights” associated with new platforms – VOD, Mobile, Internet, etc. – as new revenue centres and seeks to sell them off separately, or, at least receive incremental licence fees. Broadcasters on the other hand, view new or additional platforms as sources of audience fragmentation which invariably produce revenue threats if exploited by others. For the most part, new platforms have not represented “new” revenue for broadcasters and, if anything, have served only to decrease the revenue from traditional platforms.
 - Unregulated Internet and mobile platforms have the potential to grow exponentially and generate more and more significant revenue. US producers and broadcasters will be in a position to access Canadian viewers directly through unregulated platforms. A point may be reached with the Internet and other unregulated platforms at which Canadian broadcasters could be completely bypassed. This would result in a breakdown of the Canadian rights market that would significantly erode support for Canadian content by eroding the cross-subsidy essential to its support, at least in the English market.

- While cultural groups criticize the increasing amount of money Canadian broadcasters spend on non-Canadian (primarily US) programming, it is arguably these increasing amounts that ensure foreign rights holders remain satisfied that they are earning a fair return from the Canadian broadcasting system and that they therefore have little incentive to bypass it completely. Should US suppliers conclude that Canadian broadcast licence fees are inadequate and decide to bypass Canadian broadcasters, it could only result in significantly less money being available for Canadian content and Canadian producers, creators and other rights holders.
- In competition for revenues and viewers/listeners, the short term impact of these new technologies and services may be modest. However, as they begin to draw listeners and viewers away from conventional media, as happened with younger audiences to conventional radio in recent years, their combined impact may grow.
- Radio advertising revenues have held up in competition with other traditional media, especially with respect to television. However, television is viewed by advertising specialists as declining in effectiveness as an advertising medium, for several reasons that include the increasing cost of purchasing television advertising, increasing audience fragmentation due to expansion of television services, and technologies that enable consumers to avoid advertising in programming.
- The radio and television industries must compete with the effects of an increasingly fragmented media universe. While the short-term impacts of the parallel system of new audio services such as the Internet, cell phone and satellite/subsription radio may be modest, their combined effect may result in a reduction in tuning levels among listeners/viewers, followed by a loss of revenue once certain thresholds are met.

279. CTV also addressed the economic impact of technology on program rights, stating that:

- The borderless nature of new technologies means that exclusive program rights on a territorial basis have become more difficult to acquire and to protect, thereby threatening the integrity of the Canadian program rights market. Foreign content in Canada exists solely at the pleasure of the rights holders, or the unlicensed rights aggregator. They decide whether they can derive the most value by selling to a middleman (i.e., a Canadian broadcaster), or by selling to consumers or distributors (e.g., mobile phone companies) directly on a pay-per-view or subscription basis, or by posting the content on their own broadband channels and selling ads directly to advertisers. In the case of broadband streaming, “geo-gating” content (i.e., gating off content by territory, so that, for example, users outside of the US cannot view video streamed on a US network website) is critical to protect the exclusive Canadian program rights acquired by Canadian broadcasters.

- Despite broadcasters' efforts,⁴⁰ the abundance of pirated content on the Internet also lowers the value of the rights to those programs, with a commensurate impact on the revenues that can be attracted through television advertising. For instance, content for which CTV has the exclusive Canadian broadcast rights is posted illegally on YouTube.com (You Tube) the day after its initial broadcast by CTV – complete with CTV branding – but with ads served by Google⁴¹ and monetized by YouTube and/or a third party advertiser.) Broadcasters run the risk of these new aggregators becoming the de facto distribution point for all things other than broadcasting, with no focus on supporting either the primary business of broadcast or – more importantly – domestic television production.
- Hit shows are not performing on conventional television as well as they used to, and their potential for earning advertising revenue is diminished, due to a combination of factors that increase audience fragmentation. These factors include time-shifting caused by distant signals and the availability of programs through alternate distribution means such as over the Internet or on DVD.
- Consequently, the traditional economic model used by Canadian broadcasters, whereby revenues earned by airing profitable US programs help fund Canadian programming, is under threat and it is doubtful whether new forms of advertising will achieve the revenues formerly earned from conventional television advertising. Specialty services are also vulnerable to declining advertising revenue because, while specialty services have a dual revenue stream comprising both advertising and subscription revenue, market forces and Commission policy require that, as they mature, specialty services must rely more heavily on advertising revenue than subscription revenue.⁴²
- At the same time, the advertising market is also transforming to take advantage of opportunities presented by new technologies and distribution platforms. Advertisers are making greater use of the Internet than ever before in an effort to reach consumers directly. On the level of television broadcasting, the gradual intrusion of advertising into non-traditional areas known as “ad creep”, particularly in the form of product placement, is seen as an increasingly effective tool. The growing emphasis on these advertising methods, which sometimes

⁴⁰ CTV is actively monitoring and pursuing the piracy of its content.

⁴¹ Google sells text-based ads associated with search keywords, with revenues based on the number of hits users make upon ads.

⁴² For instance, in *Introduction to Broadcasting Decisions CRTC 2004-6 to 2004-27 renewing the licences of 22 specialty services*, Broadcasting Public Notice CRTC 2004-2, 21 January 2004, the Commission indicated that “[a]s a general principle, the Commission considers that specialty services should examine all possible alternative means to expand their revenues, especially their advertising revenues, before applying to increase their wholesale rates.”

come at the expense of traditional television advertising, poses risks to the revenues of broadcasters. Although those broadcasters with the size and scope to offer multi-platform or product placement advertising opportunities will be less affected, it is unlikely that the revenues earned through these alternative methods of advertising will be equal to those earned through traditional spot advertising.

- Product placement, prevalent in the US, is growing in use world wide, with global spending on paid placements estimated to reach \$3.1 billion this year (compared with \$2.2 billion in 2005).⁴³ While this represents an opportunity for Canadian broadcasters, it also poses a risk: where multi-national companies are already getting brand exposure in hit American programs (e.g. on American Idol), through product placements, advertisers feel no need to buy additional 30-second spots when those shows are broadcast in Canada. This highlights the need for Canadian broadcasters to develop their own hit programming that can attract either its own product placement or traditional spot advertising.
- Capturing and engaging consumers become even more important in an era where digital devices allow viewers to skip advertising: for example, in a recent survey, 87% of polled PVR owners claimed to fast-forward through commercials.⁴⁴
- The Internet is also keeping in check the expansion of advertising in traditional media around the world. A study from one major media buying group suggests that the rapid expansion of online advertising opportunities is meeting the demands of marketers, keeping price inflation in check for the overall advertising economy. While television remains the number one growth driver for the global advertising marketplace, the Internet has become the second biggest contributor. The study predicts that Internet advertising will account for 21% of ad spending in 2006 in North America, in comparison to television (33%), newspapers (11%), magazines (9%) and outdoor advertising (6%). The Internet is predicted to contribute 44% of Western Europe's spending growth.⁴⁵
- A recent study by the Institute of Communications and Advertising, which focused on Canadian marketing practices, shows that, although the advertising market is healthy, with advertisers spending as much or more as in the past, dollars spent on traditional advertising methods are being shifted into other disciplines, including Internet advertising.⁴⁶ The study found that Internet advertising continued to outperform all other categories except for direct marketing, with one in four companies reporting increases to their Internet-related marketing budgets, and with only 2% reporting a decline in the second quarter of

⁴³ S. Elliott, *A Column on (Your Product Here) Placement*, New York Times, 16 August 2006

⁴⁴ R. Grover, *Are DVRs Killing Network TV?* Business Week, 11 May 2006

⁴⁵ J. Mandese, *GroupM: Web Slows Worldwide Ad Expansion, Marketing Too*, Mediapost, 31 July 2006

⁴⁶ Institute of Communications and Advertising, *Marketing budgets revised up to largest extent in three-year survey history in Q2*, available online at http://www.ica-ad.com/new/sub_main.cfm; see also K. McArthur, *Marketers feeling bullish, survey shows* globeandmail.com, 3 August 2006

2006.⁴⁷ According to the Internet Advertising Bureau (IAB), online advertising will account for nearly 7% of all advertising revenue in Canada in 2006.⁴⁸ Although some are doubtful about the rate at which Internet advertising will generate revenue,⁴⁹ these trends support a realistic assumption that advertising for conventional television will not be the economic driver it has been in the past. In August 2006, Pontiac announced that the entire marketing budget for the introduction of its sport G5 coupe would be spent online⁵⁰, and Foster's is the first beer brand to totally abandon television advertising in favour of online advertising.⁵¹

- HD quality offers a key distinction between television broadcasting and the streaming of audio-visual material over the Internet. However, upgrades will be expensive: CTV estimates that the cost of upgrading its 25 main television station transmitters and its 89 rebroadcast transmitters, including master controls, downlink facilities and network program distribution costs, will be over \$200 million in capital costs alone – not including close to \$10 million annually in operating costs.

280. The CAB, supported by the CCSA, added that HDTV provides a ready example of the load shouldered by conventional broadcasters due to regulatory expectations. The CAB noted that “the Commission’s framework for digital and HD television is a highly detailed set of regulatory expectations relating to timelines, technical standards, and content quotas. These obligations will have a significant impact on the cost of the digital and HD transitions for broadcasters.”⁵²

C. The types of content delivered through the regulated and non-regulated systems, and how they are delivered

281. All forms of content are delivered through both the regulated and non-regulated aspects of the system.

282. The CCAU noted that new non-regulated platforms will provide windows for new content and content repositioned from traditional media. Customized short-form video is being developed for mobile and Internet use, including short snippets of information, and video material used to promote viewing of longer-form content on traditional media.

⁴⁷ *Ibid.*

⁴⁸ D. Keeble, *The Evolving State of Audio-Visual Technology: and Implications for Business and Policy Models in Canada* p. 32, Appendix 1 to the submission of the CAB, 1 September 2006

⁴⁹ See, for example, R. Siklos, *Waiting for the Dough on the Web* New York Times, 25 June 2006 at BU3.

⁵⁰ J. Halliday, *Pontiac G5 Blazes Trail to Internet-Only Advertising* MediaWorks, 27 August 2006, available online at http://adage.com/mediaworks/article?article_id=111535

⁵¹ R. Cornwell and J. Kollwee, *Foster's, the 'Australian for beer', calls time on television advertising* The Independent (UK), 4 August 2006, available online at

<http://news.independent.co.uk/world/americas/article1212768.ece>

⁵² CAB, *Broadcasting Technology – Industry Adoption and Issues* at para. 3, Appendix 2 to the submission of the CAB, 1 September 2006

There is an increase in cross-platform licensing of programming, but generally in a way that complements rather than competes with new media. At this stage, it does not appear that the new platforms will cannibalize existing television. Cross-platform projects will increasingly be anchored around major television properties and will be used to promote traditional viewing. This situation suggests a multiplier effect in terms of accessibility of Canadian programming if Canadian content created for traditional media reappears on the new platforms. In that case, traditional television undertakings should continue to be subject to meaningful Canadian content requirements.

283. CTV maintained that a great deal of the abundant unregulated content is of low quality, and that the way for traditional broadcasters to compete is to provide high-quality content via HD together with a strong brand identity. Delivering such content would be expensive, and would require depth and reach, which only the largest entertainment companies could provide.
284. CTV also noted that almost all television broadcasters are exploring new or related content models and distribution strategies, including evolving or releasing content methodically via the Internet, mobile, broadband, iTunes, VOD, DVD and other traditional paths. For traditional broadcasters, this means three things. First, a successful business model will rely on protecting content against piracy and monetizing it across as many platforms as possible. Secondly, in an era of citizen journalism, broadcasters must contribute to the content that drives that creation. For example, the US television network NBC recently completed an agreement with the Internet web site YouTube to supply the site with clips from television programs, intending to stir up interest in its programs and entice Internet users back to television.⁵³ There might also be a role for broadcasters as compilers and facilitators, selecting the best works from unregulated platforms and packaging the content for traditional television broadcast. Third, and most importantly, the use of new models encourages traditional broadcasters to emphasize the presentation of high-quality television content that will engage and retain viewers.
285. CTV further indicated that the exploration of new unregulated outlets for content must be about more than the distribution of full shows. Broadcasters must provide supplementary content on associated websites, downloadable podcasts of programs that include “extras” such as commentary from the show’s director, the creation of web logs or “blogs” related to the shows, and other online opportunities to engage viewers. Various virtual tools are being used to keep viewers interested in their favourite shows, such as chat rooms, photo albums, polls, music, trivia, live voting, instant messaging and m-commerce opportunities such as the sale of ring tones, wallpaper, and videos. Content is being designed for specific platforms such as “mobisodes” for mobile phones and specialised programs for broadband channels.

⁵³ G. Robertson, *Networks playing nice with Web foes* globeandmail.com, 17 August 2006

286. Bell Broadcast and New Media Fund (BBNMF) indicated that projects have become more multi-platform and more likely to include web and mobile components, with web strategies being integrated into a project from inception. Input from consumers on these unregulated multiple platforms is in turn influencing the content of regulated television programs. The new media component functions in part as an online marketing tool for television programs. BBNMF maintained that mobile content is becoming more relevant as a form of entertainment; however, interactive television (iTV) is an attractive opportunity that is currently more significant internationally than in Canada due to limited audience size and the lack of financial resources, rights, and technical skills. BBNMF also noted that the popularity of user-generated content is a significant change occurring in the industry. Projects submitted to the BBNMF in recent years, particularly in 2005 and 2006, have seen an increase in the use of technology like that pioneered by popular sites like YouTube, a relative novelty in 2000. More and more, media consumers are becoming producers. The evolution of passive media consumers to more active participants is leading to a fundamental shift in the way in which television is made. Web strategies are used to generate input from consumers about traditional television programs in the regulated system.
287. Cogeco maintained that it is technically possible to send, receive, manipulate and store the same types of audio-visual content through the non-regulated aspects of the system (chiefly, the Internet) as are received through the regulated system. Cogeco also noted that downloading of movies and television programs is still limited to less than 10% of Canadians who use the Internet, and that traditional television still garners a slightly greater overall share of viewing hours than Internet use.
288. Rogers indicated that broadcasters can no longer rely on the traditional regulatory framework, including priority carriage and channel placement, for the delivery of content. Working together with distributors, new technologies can be used to create compelling television programming that can compete with alternative platforms. The best way to ensure the prominence of Canadian content is to offer compelling programming that is at least as good, if not better, than the alternatives, and for traditional media to offer this content to consumers in ways that are as convenient and easy to access as what they experience on-line.
289. Rogers added that some viewers are accessing alternative platforms for content (i.e., content available via the Internet), which are essentially unregulated. These alternative platforms are becoming more robust and cost-efficient for content creators as well as easier for consumers to use. Rogers noted, for instance, that the sharing of audio and video files between individual Internet users (i.e., using software that establishes “peer-to-peer” connections) is an increasingly popular activity. Traffic studies of Rogers’ Internet network indicated that peer-to-peer traffic represents the single largest component of all network traffic, accounting for 57% of upstream traffic and 45% of downstream traffic. Beyond Rogers’ own network, surveys conducted by the Strategic Counsel in 2004 and 2005 on behalf of the Canadian Cable and Telecommunications Association (CCTA) indicated that 14% of all Canadians had watched video over the Internet in 2004, rising to 19% in 2005. According to Rogers, more recent evidence from

SRG indicated that 42% of Canadian Internet users view video on the Internet on at least a monthly basis. Lastly, Rogers cited a study it commissioned from Market Media that concludes that, although still in the early stages of commercialization, the new technologies already allow Canadians to create their own content and become their own broadcasters, access and package content of their choice across national boundaries and without regulatory restriction, unsubscribe from basic cable services and access mainstream broadcast content on a PPV basis without mandatory Canadian content, bypass the cable and DTH networks to access broadcast content on other types of broadband networks with similar performance characteristics, and access broadcast content on a variety of devices other than televisions. Traditional television stations face the distinct possibility of becoming a secondary choice after personal computers, PDAs and multimedia mobile telephones. With such options available to consumers, they will require compelling reasons to continue to choose Canadian services and programming when they no longer have to tolerate regulatory limitations on available content.

290. Telefilm Canada (Telefilm) stated that many Canadian producers are experimenting with new technologies, and designing media products and services in every imaginable format.
291. The NFB indicated that, unlike Internet users, digital music player and digital video cellular phone users are accustomed to paying for content. Therefore, there exists a potentially lucrative market for short digital films that are appropriate for display on these devices. Exploiting this market will almost certainly require the development of a new set of production techniques and rules that address the requirements of small screen display. The Internet, as well as downloading to cellular telephones and digital music players, provides new instruments for promoting and distributing short films that are rarely seen on broadcast television.
292. In its submission, Shaw made the point that the Internet, mobile devices, multi-player video games, digital music and DVD rentals are increasingly becoming substitutes for conventional broadcasting. With rapid technological advancement, new unregulated programmers and distributors compete with BDUs, aided by Canadians' increasing familiarity and comfort with the use of new technologies and digital content. A study by Market Metrics identified five enabling technologies, which have emerged since the year 2000 and are now being used by unregulated new entrants to offer services that compete with the Canadian broadcasting system: video streaming, digital music, IPTV, advanced game consoles, and multi-media mobile telephones.

D. Methods by which local, regional and national programming can continue to be provided

293. In the CBC's opinion, any distribution technology may be used to provide local, regional, national or international programming. However, services such as OTA radio and television or cable community channels, which have a distribution area limited by technology, can be expected to act as the primary sources of local and regional programming.

294. Cable Public Affairs Channel Inc. (CPAC Inc.) indicated that it has explored new technologies to better serve its audience and supplement its existing broadcast platform. For example, all of its programming offered by the Cable Public Affairs Channel (CPAC) is now available online, 24 hours a day, seven days a week, in both official languages. In addition, a number of CPAC programs are archived on its website, with VOD access. CPAC Inc. has also expanded its online presence with CPAC 2, which is a companion service to its main service. This Internet service allows CPAC to air live content such as the Gomery Inquiry, while continuing to broadcast House of Commons proceedings on the primary broadcast feed. As well, in Fall 2005 CPAC Inc. began to podcast its most popular programs. As many as 5,000 podcasts and archive downloads have occurred in a one-month period. In general, CPAC Inc. indicated that it views the new technologies as providing supplements or companions to its main service, to better serve the information needs of Canadians, while expanding CPAC's reach and presence.
295. SaskTel stated that its application for a licence to operate a national, live event PPV service was made, in order to meet customer demand and competitive pressures. Similarly, SaskTel filed an application to offer local programming on an on-demand basis through its VOD service. The flexibility of this all-digital system would provide customers with free local programming in a manner that can be adapted to their individual lifestyles. This programming will not replicate the traditional channels offered by analog systems, where customers are limited to whatever programming is being delivered at set times. Rather, all community programming would be available on demand, 24 hours per day, seven days per week.

1. Community channels

296. In *New Regulatory Framework for Broadcasting Distribution Undertakings*, Public Notice 1997-25, 11 March 1997, the Commission introduced flexibility for cable licensees in regard to the manner in which they contribute to Canadian programming and local expression, formerly required through investment in a community channel.
297. The *Broadcasting Distribution Regulations* (BDU Regulations) no longer require Class 1 and Class 2 licensees to operate a community channel. Apart from its benefits to the public through local reflection, the community channel provides cable operators with a highly effective medium to establish a local presence and to promote a positive corporate image; accordingly, many continue to offer one (*Broadcasting Policy Monitoring Report 2006*, p. 108).
298. The following table outlines the number of Class 1 licensees that have reported community channel expenses between 2001 and 2005. The figures do not necessarily represent the actual number of community channels in operation, as some channels are funded by more than one undertaking (*Broadcasting Policy Monitoring Report 2006*, p. 108).

Table 54 Cable undertakings contributing to community channels

	2001	2002	2003	2004	2005
Class 1 > 20,000	70	68	66	68	69
Class 1 < 20,000	75	75	77	69	66

Notes: Based on August 31 of each year. 2001 to 2004 figures have been updated to reflect current aggregate August 31 results.

Source: CRTC financial database
(2006 Broadcasting Policy Monitoring Report Table 4.7)

299. As the cost of transition from analog to digital technology is significant, many Class 1, 2 and 3 BDUs have recently stated that, due to lack of local interest and rising production costs, it is becoming increasingly difficult to provide community programming of high quality. As a result, BDUs indicate that it is financially not feasible to upgrade existing analog community services to digital technology.
300. The Commission has received applications from many BDUs to “reclassify” their community programming service zones. In these cases, local programming for local service areas is being reduced and in some cases, eliminated in favour of more regional-based programming and service.
301. To ensure there is a suitable amount of local expression in some communities, independently-owned community programming undertakings may be an important provider for local and regional programming. In response to this concern, in *Policy framework for community-based media*, Broadcasting Public Notice CRTC 2002-61, 10 October 2002 (Public Notice 2002-61), the Commission introduced four classes for community-based media: cable community channel, community programming undertaking, community-based low-power television undertaking and community-based digital service. Each community-based media has different operating criteria.
302. Traditional broadcasters seem to be adapting to the new media environment as content providers and distributors. Unregulated content is being used to complement and promote regulated content. Regulated content is being recycled for distribution on unregulated outlets, often in shorter forms for promotional purposes. The symbiotic relationship between regulated content and unregulated content raises questions about programming access, and the need to ensure that Canadian content created for traditional broadcasting also has a presence in the unregulated or parallel broadcasting system. Multi-platforming could be used to build audiences for Canadian content.

E. The predicted economic impact of new technologies on broadcasting undertakings

303. According to CanWest, both traditional and new media formats provide more outlets for advertisers to use and options for consumers. This fragmentation puts downward pressure on unit costs and as the cost of channels declines, less costly reality and variety programs emerge. The economic impact of this fragmentation is that it becomes riskier to

invest in high-quality drama programs and, as the media market is fragmented, makes it more difficult for local or national broadcasters to produce content that will continue to attract large audiences.

304. CanWest noted further that at the present time, broadcasting of television programs has the advantage over streaming video on the Internet. However, streaming technology is improving and it is possible that in the future a program's audience, success and revenues will be measured across multiple platforms and multiple business models.
305. Saskatchewan Communications Network (SCN) cited the fact that the US federal government has a plan to move its broadcasting industry to HD in 2009. No such plan exists in Canada, and SCN expressed concern that the Canadian broadcasting system will be economically disadvantaged as it lags behind and Canadian viewers migrate to US HD services.
306. CPAC Inc., as a non-profit entity with a fixed revenue stream and the absence of advertising revenue, expressed concern about the economic impact on its service due to the prohibitive cost of converting to HD, estimated at \$4 million in capital expenditures, and almost \$1 million in additional operating expenses annually.
307. Bell submitted that new audio-visual technologies are establishing themselves as exempt, i.e. unregulated, broadcasting distribution platforms, and that their economic impact on the Canadian broadcasting system, although complementary in the short-to-mid term, will likely be disruptive in the long-term.
308. TELUS noted that technology has expanded the time spent on the consumption of media by making access portable and extending the reach of media from home to office and in-between. That, in turn, has increased potential advertising and multi-platform promotional opportunities. The economic impact is that this extended reach of media provides opportunities for content providers to establish new windows for products, thereby offsetting pressures associated with increased choice and fragmentation. In TELUS' view, providers that have invested heavily in production and rights will be best able to adjust to market changes.
309. Moreover, technology shifts the role of the consumer from a passive recipient to a more active component of the system. As a consequence, consumer demand has become a greater factor in determining supply. This does not mean the majority prevails at the expense of minorities. It means that supply expands exponentially from mass media to minority, or "long tail" interests. Enterprises and creators that can harness and respond to this demand shift could see significant growth in their businesses.
310. As noted in the CMRI report,

All of the population growth in the next 25 years will come from older groups, while younger age groups (under 35) will actually shrink in absolute terms and become a much smaller percentage of the population. So, for the next quarter century,

broadcasters and producers must balance the emphasis and resources on youth media, i.e. iPods, downloading from the web, mobisodes, podcasts, etc. versus the more traditional programming formats and platforms that middle-aged and older consumers want.

311. In assessing the impact of new media on traditional broadcasting markets, it is important not to be blinded by rhetoric and hyperbole. While TELUS is convinced the new media revolution is real, it takes time for new markets to gel and for sustainable business cases to be established. TELUS maintained that in most markets, we are still at an innovation and early adopter stage. But change is much more dynamic today than in the past and the opportunity to adjust to emerging realities should not be squandered.
312. The APFTQ questioned the economics of requiring broadcasters to invest in the construction of OTA digital transmitters to serve the approximately 11% of the population that receives their television signals OTA. As 89% of Canadians receive or can receive their television by cable, APFTQ maintains that the money would be better spent in acquiring high quality Canadian programming.
313. The Alliance des radiodiffuseurs communautaires du Canada (ARC du Canada) expressed its concern that, as the Canadian broadcasting system evolves over the next few years, community radio will have to find a niche in the new system. With its lack of financing and small size, community radio risks finding its prospects of growth reduced.
314. According to the CAB, there are a number of areas in which these technologies will have an economic impact on broadcasting undertakings, namely:
 - Private radio broadcasters are facing new forms of unregulated competition (e.g. broadband radio, podcasting) at the same time as they are planning their digital business models. Opportunities exist for traditional radio broadcasters to make use of new platforms to extend the reach of their brands and content, but so far, those opportunities do not represent revenue opportunities equal to the impact of new audio and multi-media technologies on radio's business models.
 - The audience for television has not grown; therefore more channels simply fragment the audience more and more. While the subscriber revenue stream will continue to rise, advertising rates will fall as the audience for any given commercial becomes smaller. The combined sources of revenue will ultimately reach a point where they cannot support attractive, competitive new programming to fill the channels available.
 - The cost of upgrading to digital/HD production and transmission are substantial for both large and small market television broadcasters, and for specialty and pay services. A key economic issue is the extent to which these costs significantly increase capital investment and operating expenses without any ability to recover the incremental costs in the marketplace under existing regulatory and business models.

- The main costs associated with digital and HD transitions are for upgrading the production and master control facilities, but conventional broadcasters also face additional transmission costs for upgrades, replacement, etc, and specialty and pay broadcasters face increased satellite uplink fees.
- Incremental costs associated with the adoption of digital and HD technologies specific to French-language broadcasters are mainly related to the need to upgrade studios used for local production other than news. These additional costs are necessary because French-language broadcasters produce a wider variety of programs from dramas to sitcoms, and therefore have to maintain a greater number of production studios than are required in the English market.
- The adoption of digital and HD technologies by private broadcasters is occurring under a variety of scenarios, depending on a number of regulatory and business considerations. However, the one constant is that the costs associated with the transition are largely unrecoverable in the current regulatory and business environment.
- Internet advertising is the fastest growing segment of the Canadian advertising industry. According to the IAB, in 2006, Internet advertising is expected to account for nearly 7% of all advertising revenue in Canada. We are bound to see slowdowns in sectors such as radio and television because Internet advertising is more targeted.
- PVRs are a potential threat to advertising revenues because they allow viewers to skip advertising in recorded programs. While a significant impact is yet to be felt, it is predicted that advertising revenues will be significantly less by 2010. This is projected to be due to several factors, including PVRs and saturation due to multiple choices and decreased attention due to multi-tasking by viewers.
- The much-hyped “interactive television” revolution has yet to materialize, at least to the extent that it would result in new revenue streams to offset the onerous transition costs. Nor are broadcasters’ current mobile and broadband initiatives delivering nearly the return on investment necessary to counterbalance new digital/HD production and transmission costs.
- The impact of new technologies and new services may also be experienced more dramatically in certain segments of the industry. For example, the impact of satellite/subscription radio services may be experienced more acutely in small radio markets that already have significant business challenges.

315. CIRPA stated that:

- In the next five years, it is unlikely that new technologies would represent a serious threat to conventional broadcasting systems. Even though younger consumers are quickly adopting new technologies, the majority of consumers over 30 years of age are adopting them at a much slower pace.
- The majority of technological changes having the greatest effects on traditional broadcasting have emerged only in the last 18 months. Further, the most rapid changes in technology are occurring in the field of new devices and services. It is expected that the broadcasting system will be affected by such concepts as IPTV, video mobile phones and the carriage of satellite subscription radio via traditional BDUs, coupled with an increasing demand for a variety of content for these devices and services rapidly coming to market.

316. The CCAU, the CEP and the CCA all indicated in their submissions that new platforms will serve as an adjunct to television, and not as a replacement.

317. The CCAU also indicated that the use of new platforms will be anchored around television viewing and that these platforms will be an extension of a main program and may even serve to increase the ratings of television programs.

318. The CEP indicated that it is hard to determine the rate of adoption of new technologies by future generations, who may or may not decide to adopt the viewing patterns of their parents, and also may have different programming tastes.

F. Adoption of new technologies by the independent production sector and the impact of them

319. In the CBC's view, the independent production sector must adapt to the changes in broadcasting technologies and formats. While this constitutes a challenge to some established businesses, ultimately it represents a source of significant new opportunities, provided adequate resources – financial, technical and creative – are available.

320. In addressing this issue the CFTPA made the following points:

- Canadian independent producers are actively engaged in using new technologies to produce and deliver content to Canadians.
- Most television producers now develop companion websites for most, if not all, of the television programs they produce.
- Certain television and new media producers are making content available to MoboVivo for downloading to video iPods.

- The producers of one Canadian television program are producing 13 original “webisodes” of the program and making them available for download on the CTV Broadband Network.
- Another Canadian producer is producing two- to three-minute webisodes of a popular television program and making them available for download on the CTV Broadband Network.
- The producers of a new preschool series have made the program available to a Canadian broadcaster for mobile, online and VOD.
- According to a survey of CFTPA members, 66% of television producers are currently producing content in HDTV format, and 56% are producing video content for the Internet or mobile platforms.
- 87% of those surveyed who are not currently producing content in HDTV expect to begin producing in HD within the next two years. This suggests that producers have embraced HD despite the challenges they face in producing HD programming, such as extra cost and lack of funding.
- 65% of television producers surveyed agreed with the statement “finding the money to produce content in HDTV is difficult” and 78% agree that “Canadian broadcasters are generally not willing to pay a premium for HDTV content despite the added costs of producing in HD and/or the added value of the content.”
- 55% of television producers surveyed who are currently producing content in HDTV say the cost of producing programming in HD is expensive but manageable; 39% say it is reasonable; and 6% say its prohibitive.
- 48% of television producers say that on average, producing content in HD costs 15% to 20% more than does producing in SD. Of producers who are currently producing in HD, 48% are funding a portion of the extra costs themselves, while 19% are funding the entire amount themselves.
- According to the Nordicity Group study filed with its submission, the profit margin (earnings before taxes) of Canadian independent producers dropped from 6.7% in 1999 to 1.6% in 2002. It recovered to 4.3% in 2004, but that level was still equal to only two-thirds of the profit margin of all industries and about 60% lower than that of all broadcasters.
- With inadequate funding from broadcasters and a weak financial position in the sector, independent producers are concerned that both regulated and unregulated new digital platforms will increasingly be filled by foreign (likely US) content.

321. The OMDC made the following comments:

- Independent producers are becoming adept at navigating the multi-window and multi-platform universe that is today's broadcasting environment. Many are already developing products that are intended for online distribution or for distribution through mobile devices. In an Ontario study, all of the survey respondents currently producing traditional television programs and films indicated that they intend to continue doing so over the next three years. But, in addition to the continuation of these core business activities, the survey respondents also indicated the following plans for the future:
 - more than twice as many respondents than are currently doing so are planning to produce programs intended for online distribution in the next three years,
 - 50 more respondents than are currently doing so intend to produce interactive products intended for online distribution in the next three years,
 - almost three times more respondents than are currently doing so are planning to produce programs intended for distribution through mobile devices in the next three years, and
 - twice as many respondents than are currently doing so are planning to produce interactive products intended for distribution through mobile devices in the next three years.
- These producers are clearly ready and able to face the challenges and take advantage of the opportunities presented by the new technologies that are part of today's broadcasting world. However, producers cannot be expected to bear the costs of dealing with these challenges alone. Broadcasters who wish to exploit new programming opportunities need to increase the licence fees they pay for all the programming they are acquiring, no matter how it is delivered to the audience.
- All of the producers surveyed who indicated they are producing HD programming for broadcasters also said this programming is more expensive to produce, with more than half (53%) indicating that HDTV programs cost 21% to 50% more than SD programs. At the same time, 90% of those producers said that these costs are not covered by broadcasters through increased licence fees.
- Producers are also bearing the costs of the more complex development process. In addition to the traditional elements of program development, producers must now also take into account new delivery platforms and new elements such as interactivity that may need to be integrated into traditional programs. While producers are incurring greater costs for this increased complexity, there are not

yet revenue models for these additional features and broadcasters are attempting to acquire these features for free. Since no one yet knows what the features are worth, policies that require “fair market value” for exploitation of intellectual property in order to access government funding are virtually meaningless.

- As delivery of programming over the Internet increases, this could have profound implications for independent producers and the entire Canadian broadcasting system. Since the Internet is unregulated, there are no domestic expenditure or Canadian content safeguards. Internet programming was seen as a complement to, rather than a replacement for, television broadcasting. While the complementary nature of Internet programming is unlikely to change in the near future, its increasing popularity and the corresponding growth in share of Internet advertising revenues is challenging some of the assumptions made in the context of *Exemption order for new media broadcasting undertakings*, Public Notice CRTC 1999-97, 17 December 1999.

322. CTV maintained that there are new opportunities for independent producers to create innovative and customized content for broadcast on mobile phones or online. Integrated relationships between traditional and non-traditional broadcast media can be formed, with commensurate benefits for both.
323. The NFB stated that the adoption of digital technologies by the independent production sector raises a variety of issues related to costs, particularly the costs of producing in HD digital formats, rights management (including the sale of productions to various platforms) and security to protect rights holders, including creators.
324. For example, broadcasters are increasingly demanding rights to television programs for multiple platforms. For the independent production sector and the NFB, the individual pricing of such rights is a basic principle that must be respected. The NFB considers that broadcasters should not acquire rights for platforms that they cannot use within their own corporate group.
325. The APFTQ stated that digital broadcasting will provide a unique opportunity for Canadian producers to export their product to other countries in order to maximize their revenues. This is already happening with documentaries produced in HD.
326. The UDA stated that, like broadcasters, independent producers will continue to adapt to the changes in technology with success.
327. The CAB made a number of comments on the adoption of technologies by the independent production sector and the impact they would have on the sector, including:
 - the main issue for producers in a multi-platform world is the protection and exploitation of rights.

- content producers face significant incremental costs in the digital/HD environment as the cost of producing HD television is typically 10% to 15% more than the cost of producing television in SD.
- factors that tend to result in higher costs for HD programming include equipment rental (companies charge a premium for HD equipment, 3% higher than for SD), post production (HD tape is five times more expensive than SD tape) and increased “on-screen” costs because HD production requires new sets, special make-up, etc.
- an April 2006 study entitled *Status of Digital Production in Canada* showed that approximately 50% of Canadian television production is captured in SD digital, which the report describes as the preferred choice for lower budget productions. The report estimates that in 2004/2005, over 800 hours of Canadian television content were produced in HD, while over 4,000 hours were produced in SD. Of the over 2,000 hours of Canadian programming supported by the CTF in 2004/2005, 178 hours were produced in HD, and 2,100 in SD.
- as broadcasters are the primary investors in independently produced Canadian television productions, it stands to reason that independent producers will look to recover some of their incremental HD production costs in the form of higher licence fees to be paid by Canadian broadcasters.

Section IV – Concluding observations

A. Introduction

328. In the OIC, the Governor in Council stated that it sought “a factual record on the future environment facing the whole broadcasting system that will inform the Government’s own policy determinations with respect to the future of broadcasting in Canada”.
329. In assessing the impact on the broadcasting system of new audio-visual technologies, among the areas that the Governor in Council requested that the Commission seek comment and report on were:
- the economic and regulatory impact on the broadcasting system caused by these technologies;
 - the kind of content delivered through the regulated and the non-regulated aspects of the system, and how it is delivered; and
 - the predicted economic impact these technologies will have on broadcasting undertakings

330. A large majority of the submissions received by the Commission not only addressed issues of current and predicted impact, but made specific recommendations concerning policy direction, including the appropriateness of the current legislative framework under the *Broadcasting Act* (the Act), its priorities and instruments, and the role of regulation, market forces and public subsidy.
331. While not strictly “factual” in nature, the Commission considers these comments to be consistent with the purpose of the OIC, and therefore deserving of observations. Accordingly, in this section, the Commission discusses the positions of parties on some of the key policy issues and closes by setting out its views, where appropriate.

B. Appropriateness of current legislation

332. The majority of parties either explicitly or implicitly supported the current legislative framework under the Act. While parties held a wide range of views on matters of priority and degree of regulatory oversight, even those who called for a different emphasis were largely content to advocate change from within the current legislative framework.
333. The CAB, for example, stated as follows:

While policy and regulatory approaches need to be updated for the complex communications and media world that we are operating, new approaches for broadcasting policy should still be guided by the fundamental principles of the Broadcasting Act and the specific realities of the English and French market.

334. Similarly, Rogers called for a more flexible approach to regulation, still guided by the Act:

[B]roadcasting and cultural policy objectives under the Act remain relevant, but the broadcasting system can only continue to play an important role in the lives of Canadians if it is regulated and supervised in a more flexible manner.

335. Three parties called specifically for changes to broadcast legislation. Cogeco called for “unified” telecommunications and broadcasting legislation:

... the Canadian Government should undertake without further delay legislative reform with a view to adopting comprehensive and unified legislation dealing with electronic communications, as has already been done in Europe and as recommended in the Afterword of the final report by the Telecommunications Policy Review Panel ...

336. The APFTQ suggested that the *Broadcasting Act* and the *Telecommunications Act* be harmonized. Quebecor suggested that such a harmonization include the *Copyright Act*.
337. In addition, the Communications Research Centre (CRC) noted that: “The convergence between telecommunications, Internet and broadcasting networks is accelerating and may require a convergence of regulation between telecommunications and broadcasting.”

C. The impact of new audio-visual technologies on the objectives of the *Broadcasting Act*

338. A common theme among the submissions is that the new audio-visual technologies are creating a more “open” Canadian broadcasting system. While Canadians still consume the vast majority of electronically delivered audio-visual information and entertainment programming through regulated Canadian broadcasting undertakings, they are now increasingly accessing programming via currently unregulated electronic platforms – primarily the Internet and, to a lesser but growing extent, mobile networks.
339. As pointed out by the CAB and other parties, Canadians can, in theory, bypass the regulated Canadian broadcasting system altogether and still obtain much of the same kind of programming that licensed broadcasting undertakings were once uniquely positioned to provide. This includes:
- local, national and international news and information programming,
 - streaming music,
 - movies and television series, and
 - foreign programs and channels.
340. Many interveners also noted, however, that it is those characteristics of the Internet that differentiate it from traditional broadcasting that are driving its adoption. These include the fact that it is a largely borderless global platform, with access to almost limitless content, available on demand virtually anywhere with increasing quality.
341. Together, these characteristics have the potential to significantly impact both the business of Canadian broadcasting and the objectives public policy seeks to achieve through the Act.
342. A number of parties suggested that these trends require placing a different emphasis on, or finding new ways of approaching certain objectives of the Act.
343. Distributors largely argued for a greater emphasis on economic objectives such as innovation and consumer choice. Distributors also suggested that such an emphasis would advance, or at least need not come at the expense of, cultural objectives. For example, Rogers argued that “broadcasting policy and regulation should foster consumer choice and program diversity, having regard to the need to maintain a predominantly Canadian system.” TELUS argued that technology “may now be providing solutions to the diversity challenge by exponentially expanding the choices available and providing

an environment where even content with very scarce and scattered audiences can succeed.” Bell argued that there is a “wealth of Canadian content available to Internet users”, obviating any need for regulatory intervention.

344. By contrast, cultural groups generally took the position that cultural objectives should be paramount and that these objectives would be at risk if regulatory or other public policy measures were not extended to new platforms. The CFTPA advocated a requirement for preponderance of Canadian on all platforms. SOCAN expressed concern that by not regulating new technologies “there is less Canadian content available to Canadians”.
345. Private broadcasters generally had no issue with the objectives of the Act, but expressed concerns over “regulatory asymmetry”. Educational broadcasters argued that greater emphasis needed to be placed on the non-commercial objectives of the system, particularly educational programming, given the potential for greater impact on their services. The Commissioner for Official Languages stated that there should be continued emphasis on the social objectives, “specifically the principle of the equality of English and French”.
346. The Commission notes that the current Act distinguishes between subsection 3(1) objectives for broadcasting policy and subsection 5(2) objectives of regulatory policy. The section 3 objectives are mostly cultural in nature, while the section 5 objectives include broader regulatory concerns of technology adoption, consumer choice and administrative burden.
347. In general, the Commission considers that while parties to this proceeding expressed support for or acceptance of the section 3 *broadcasting policy* objectives of the Act, they had significant differences of opinion as to the weight, priority and effect given to implementing these objectives, that is the crafting or interpretation of section 5 *regulatory policy* objectives.
348. This dichotomy of interpretation and implementation is no more evident than in the stark differences of opinion between proponents of “consumer choice” and “Canadian content”.
349. On the one hand, Shaw states:

The current regulatory approach, by seeking to limit consumer choice, is inconsistent with the *Broadcasting Act*. The *Act* requires the provision of *comprehensive* programming choice from local, regional, national and international sources (and *nowhere* mandates denial of choice) ... Nothing in the current *Act* needs to be changed to accommodate a new, simplified framework that frees Canadian BDUs and programmers to compete in the new environment.

350. On the other hand, SOCAN states:

SOCAN is concerned that there is less Canadian Content available to Canadians. Increasing access to more US product does not mean that Canadians have more choice. Declining diversity and lack of access to Canadian Content means Canadians have less choice. There is a fundamental difference between more choice, and more of the same.

351. The Commission also notes that different platforms and services have always had a greater or lesser capacity to contribute to the objectives of the Act. To this end, as the OIC suggests, it is important to distinguish between the kind of audio-visual content made possible by, or available through, new technologies.

352. Parties generally referred to audio-visual content in one or more of three broad categories:

- User-generated content. This tends to be inexpensively produced, largely non-commercial, lower quality content. This type of content is manifested in the success of social networking sites such as “YouTube” and “Myspace”.
- Relatively inexpensive, commercial content. This includes news and sports clips, music and other information and entertainment content. Canadian content of this type abounds on Canadian television and radio today and is generally viable in Canada without significant direct subsidy.
- High quality, relatively expensive programming, such as drama and documentary. This type of content is popular on Canadian television but has generally not been produced in Canada without significant subsidy. Canadian content in this category remains largely “uneconomic”.

353. The evidence shows that the open nature of the Internet and other new digital media is allowing user-generated, non-commercial audio-visual content generated by Canadians to flourish. This user-generated content would also appear to be outside the intended scope of the Act. In any event, user-generated content appears to require no regulatory intervention, at this time.

354. In the second category of relatively inexpensive commercial content, Canadian undertakings are, at the present time, showing evidence of successfully competing without regulatory intervention. For example, as noted in the CMRI report filed by the Telco parties, Canadian web sites dominate in the news and information category, with 17 out of the top 20 most popular sites (by monthly visitors). The Commission was not provided with specific evidence on the availability or usage of Canadian content on the Internet but, at least in this category, there appears to be no compelling evidence for regulatory intervention, at this time.

355. It is in the third category of high quality, relatively expensive content, still nascent on Internet and mobile platforms, that parties expressed the most significant differences of opinion.
356. Cultural and broadcast parties expressed strong concerns that without public policy intervention of a regulatory and/or subsidy nature, distinct Canadian programming of this type would suffer. As articulated by the CBC:

Amidst all this change, one thing is clear. If Canada is going to continue to have a broadcasting system that meets the needs of Canadians, a system that provides them with audio and video programming that reflects their country, their communities, their music, their way of being in the world, then Canadian broadcasters and the Canadian government must collectively develop new ways to ensure that high quality Canadian programming has a place on Canadian televisions, radios, computers, iPods, cell phones, and every new device that comes on the scene.

357. On the other hand, most distributors suggested that the Internet should provide greater opportunities for content to find audiences both domestically and around the globe. Bell noted that the Internet was becoming a medium for the delivery of third-language programming. Shaw argued that “the market, rather than a rigid and complex regulatory system, is the best way to ensure that Canadian consumers receive attractive, high-quality and affordable Canadian programming choices”.

D. The evolution and impact of new audio-visual technologies

358. The record of this proceeding confirms that Canadians’ use of new audio-visual technologies continues to grow significantly and, for younger Canadians in particular, represents a shift in media consumption patterns. Nevertheless, the majority of submissions suggest that, to date, any negative financial impact on the broadcasting system caused by such changes in media consumption patterns has been marginal. As the CMRI research points out, while Canadians use the Internet on the order of six hours per week, aggregate tuning to radio and television has remained largely unaffected, and broadcast industry revenues have continued to grow.
359. Parties had differing views, however, on the matter of future economic impact.
360. Many parties suggested that traditional radio and television broadcasting can remain vibrant and profitable for the immediate future.

361. As stated by Bell:

The Canadian broadcasting system is healthy at this time. It will not be usurped by new audio-visual technologies in the short (and perhaps) medium term. Unregulated distribution technologies will, for the most part, play an additive role to that of traditional broadcasting, complementing and enhancing the current regulated system rather than becoming a substitute for it.

362. Similarly, TELUS argued that “traditional broadcasting will continue to have an audience for the foreseeable future ... new technologies and over-the-top service providers are disruptive, but not harmful”, while CCAU stated “signs point to a relatively robust scenario for Canadian ... television over the next number of years”.

363. Other parties suggested more immediate negative economic impacts.

364. For example, Cogeco stated:

... the Canadian broadcasting system is clearly under pressure as the competitive and financial position of Canadian players in this system is threatened by disruptive audio-visual technologies ...

365. The NMBA similarly stated:

... we can have little doubt at this point that new media and interactive media content are growing in cultural and economic performance and are affecting the television broadcast paradigm.

366. Essentially, all parties shared the view that new audio-visual technologies will have some economic impact on broadcasting undertakings. They differed on the “when” and “by how much” – not the “if”.

367. Parties cited a number of factors which will affect the timing and extent of economic impact, including:

- usage trends and the pace of change;
- the degree of substitutability between services and content provided by broadcast platforms and new audio-visual technologies;
- the relative ability to monetize usage on the new platforms either through advertising or subscription revenue models;
- the efficiency and cost effectiveness of “broadcast” versus “unicast” network architectures;
- the availability, pricing and user-friendliness (including ease of access and quality) of consumer equipment; and
- competitive and/or public policy response, including the ability of the broadcast system to offer Canadians equivalently priced and available content.

368. Given the evidence before it, the Commission considers that while traditional distribution, television and radio undertakings will continue to have a significant place in the lives of Canadians for the foreseeable future, new audio-visual technologies will have an increasing impact over time.

E. Monitoring the impact and contribution of audio-visual technologies

369. One of the common themes emerging from the submissions is the need to monitor developments relating to audio-visual technologies; their potential and actual contribution to the objectives of the Act; and, their impact on the ability of licensees to contribute to those objectives. As noted by the CAB:

Public policy needs to develop a more thorough understanding of new audio-visual technologies, and impacts ... including the extent to which regulatory oversight of new technologies may be appropriate.

370. The CCAU stated:

... the CRTC and the government should closely monitor developments at home and abroad with regard to the impact of the unregulated platforms. Once the Commission's upcoming policy review proceedings for over-the-air television and pay and specialty television are concluded, the CRTC should convene a policy proceeding to reassess the impact and regulatory status of these platforms.

371. Pelmorex also underlined the need for clear and accurate information and proposed an industry working group that could report to the Commission on a regular basis with respect to developments in new technologies and their impact on the system.
372. The Commission agrees that there is a need to monitor developments relating to all audio-visual technologies and in particular their use by Canadians, their contribution and their impact.
373. Continued and focused monitoring of the new audio-visual technologies, in particular, appears all the more important given significant differences of opinion expressed on both the state of these technologies and the need for, and nature of, any public policy response.
374. The Commission's annual Broadcasting Policy Monitoring Report, now in its seventh edition, is one means by which the Commission currently provides an ongoing assessment of the performance of the Canadian broadcasting system in relation to CRTC regulations, policies and decisions.

375. Detailed ongoing monitoring of developments in the evolution, contribution and impact of audio-visual technologies will be an essential underpinning to informed public policy response, including:

- the need for and timing of amendments to the regulatory frameworks of existing broadcasting undertakings;
- the nature of regulatory oversight, if any, appropriate to new audio-visual technologies; and
- the need for additional public policy response outside the jurisdiction of the Commission.

F. Addressing the impact of new audio-visual technologies on existing broadcasting undertakings

376. The Commission acknowledges the efforts made by parties to present meaningful data on the new audio-visual technologies. In this regard, the Commission notes the submission of the CRC with its useful summary of the wide range of digital technologies being used throughout the world.

377. A number of parties argued that in light of the emergence and increasing popularity of new audio-visual technologies, the Commission should eliminate certain detailed regulations, introduce increased regulatory flexibility and/or rely to a greater extent on market forces. Implicit in these comments was the notion that increasing competition from the new technologies reduces the capacity of broadcasters and distributors to contribute, or at least contribute in the same way.

378. These calls for decreased regulation came largely from the regulated industries themselves, most notably the distribution sector.

379. Shaw, for example, stated its "... strong belief that the existing broadcasting regulatory framework – specifically the regulations governing BDUs – must be immediately and substantially overhauled if Canadian distributors and media companies are to compete, survive and flourish in the new communications environment." TELUS suggested "... it is time to fundamentally reconsider the rules and regulations built on and required by spectrum scarcity".

380. Bell stated:

In the longer term, it is anticipated that new, on-demand distribution models may fundamentally change the way in which consumers access programming. New audio-visual technologies are necessitating a regulatory reassessment. A lighter hand is required therefore in order to give regulated broadcasters and BDUs the flexibility to expand their reach

into new media, to compete against unregulated entities and to provide consumers with more innovative packaging options. It will be necessary for broadcasting regulation, as established pursuant to the *Act* and the *Regulations*, to achieve a new and more delicate balance.

381. Three of the seven parties with broadcast distribution interests called on the Governor in Council to direct the CRTC to eliminate “micro-regulation” of the BDU sector.
382. Broadcasters also called for less regulation. For example, CTV called for a “light-handed regulatory structure to strengthen broadcasters’ ability to compete with unregulated entrants in a borderless world”. The CAB argued that “there will be important areas in which licensed broadcasters will need regulatory flexibility to reduce the degree of regulatory asymmetry that currently exists, if they are to continue to make a strong contribution in the face of unregulated competition.”
383. By contrast, parties in the production and cultural industries were generally supportive of increased, or at least continued, regulatory vigilance. SOCAN, for example, stated “the fact that the technological means or media may have changed does not mean that the Commission should abandon its regulation of content.”
384. In light of pending, current and planned reviews, the Commission will not specifically comment on proposals for regulatory change to its various regulatory frameworks for existing broadcast undertakings.

G. Regulatory oversight of new audio-visual technologies

385. Pursuant to *New Media*, Broadcasting Public Notice CRTC 1999-84, 17 May 1999 (Public Notice 1999-84) and *Exemption order for new media broadcasting undertakings*, Public Notice CRTC 1999-197, 17 December 1999, the Commission has to date exempted from licensing, without terms and conditions, new media services delivered and accessed over the Internet.
386. As set out in Public Notice 1999-84, among the reasons the Commission chose not to regulate the Internet at that time was its view that:

... the circumstances that led to the need for regulation of Canadian content in traditional broadcasting do not currently exist in the Internet environment. Market forces are providing a Canadian presence on the Internet that is also supported by a strong demand for Canadian new media content.
387. In *Regulatory framework for mobile television broadcasting services*, Broadcasting Public Notice CRTC 2006-47, 12 April 2006 (Public Notice 2006-47), the Commission concluded that current mobile broadcasting services that are delivered and accessed over the Internet fall under the current exemption order. The Commission also stated its view that:

... there is nothing on the record of this proceeding to indicate that the use of the Internet to deliver and access programming has increased to the point that the ability of traditional broadcasters to fulfill their obligations under the Act has been impeded.

388. The Commission is currently considering the more general exemption of mobile television broadcasting undertakings, whether or not these services are delivered and accessed over the Internet.
389. The issue of potential regulatory oversight over the Internet or mobile based audio-visual technologies was one that almost all parties addressed and with a great difference of opinion.
390. Parties with broadcast distribution interests were strongly of the view that the exemption order should be continued and extended to other new audio-visual technologies. TELUS called on the Governor in Council to direct the CRTC in this regard.
391. Bell stated:
- Broadcasting industry stakeholders recognize that regulating the distribution of new technologies such as Internet video and wireless mobile TV is impractical, unnecessary and ultimately counter-productive.
392. MTS/Allstream stated:
- ... at this point it would be extremely difficult, if not impossible, to impose licensing or other regulatory obligations [on new media Internet/mobile TV services] given the sheer numbers involved ...
393. The CBC, the Commissioner for Official Languages, and parties in the production and cultural industries had opposing views.
394. The CBC argued that it was time to re-examine the new media exemption order and in particular “whether managed or subscription based Internet broadcasting should continue to be exempt.” SOCAN argued that the “lack of regulation of new technologies is diluting the Commission’s effectiveness”. The CCAU urged the Commission to “convene a policy proceeding to reassess the impact and regulatory status of these platforms”, and to regulate “if circumstances warrant”.
395. The NMBA argued that the new media exemption order was correct in 1999, but that the Commission “was overly optimistic in regards to the future potential of the Canadian new media industry to thrive in an unregulated and fast-changing global market.”

396. The Commission notes the comments from many parties that the new media exemption order has helped foster innovation and entrepreneurship by Canadian companies on the Internet. The Commission also notes the comment from Rogers that the “traditional broadcast system lacks incentives needed to encourage investments in new technologies and services”.
397. It is certainly the case that the presence of the new media exemption order does not in any way preclude Canadian entities from undertaking self-initiated activities consistent with the objectives of the Act. Nor does the presence of the new media exemption order prevent government or the Commission from creating incentives to encourage broadcasting undertakings to launch Canadian content-rich Internet or mobile based services or invest in new media technologies that help promote Canadian content.
398. Traditional regulatory approaches are not the only means by which public policy can enhance a Canadian presence on new media platforms. Incentive-based regulatory measures may ultimately be more likely to succeed in the emerging “open” broadcasting system.
399. The Commission notes that many broadcast undertakings have launched Internet and mobile based services that enhance the presence and promotion of Canadian programming. Such activities are to be encouraged and the Commission is open to considering specific incentive proposals designed to expand the scope or nature of such activities.

H. The need for non-regulatory public policy action

400. While the Commission is responsible for regulating and supervising all aspects of the Canadian broadcasting system, it is not the only government body or agency charged with supporting Canadian audio-visual content. As stated by CTV:

Government cannot ensure the creation of high quality programming simply by reviewing the regulatory system applicable to Canadian broadcasters ... [it must also] look at the system of content development as a whole and in particular at how funding mechanisms can be adapted in light of the new and evolving digital environment.

401. CanWest noted that:

... one of the important consequences of new technology and its impacts may well be a shift in the balance between regulation and subsidy, with less emphasis on regulation and more on subsidy.

402. A number of broadcasters and distributors suggested that a new digital infrastructure, be it HD or broadband, merited government support or incentives, potentially through a reallocation of Canadian content and production funding. On the other hand, most cultural parties argued in favour of increased funding to support both high quality Canadian television programming and new media content.
403. Parties also raised issues relating to copyright and program rights generally. TELUS, for example, argued for “flexible copyright exceptions”, while the APFTQ argued for a private copy levy on digital media. A number of parties across all sectors, including the CAB, the CCAU and Bell, also commented on the importance of maintaining and/or enhancing measures that support the integrity of the Canadian rights market.

I. Timing and choices

404. The Commission notes that many parties expressed a sense of urgency that the government and/or the CRTC should take action, notwithstanding the lack of agreement on what that action would be.
405. Quebecor, for example, stated that Internet will soon have consequences for broadcasting policy ... now is the time to have a fundamental debate on broadcast regulation ... quotas will no longer be practical ... the desire to maintain a Canadian presence must move to incentives rather than coercive measures:
406. Similarly, the NMBA considers:
- ... that there currently exists a window of opportunity, which may be narrow, for the Government of Canada to make significant strategic contributions that may create the conditions necessary for Canada to build a truly strong and competitive interactive media industry.
407. The need to balance economic and cultural goals and the continued tension between maximizing consumer choice and promoting Canadian choices will only increase as the Canadian broadcasting system becomes more open. Policy-makers will be called upon to make choices and, in particular, answer some fundamental questions underlying many of the issues raised by parties in this process, including:
- Do public policy makers expect the new audio-visual media to make an explicit contribution to Canadian cultural and social goals?
 - If so, can these expectations be best fulfilled without public policy intervention?
 - If public policy intervention is required, what are the most effective tools that can be used?

J. The Commission's perspective on the policy issues raised by parties to this process

408. Based on its review of the submissions on policy issues, the Commission considers that the following questions are central to the Government's policy determinations with respect to the future of broadcasting in Canada:
- Is the current Act appropriate, or at least adequate, to address the issues raised by new audio-visual technologies, and in particular do the objectives of the broadcasting policy set out in subsection 3(1) of the Act, the objectives of regulatory policy set out in subsection 5(2) of the Act, and the priorities established under subsection 5(3) of the Act remain relevant and appropriate?
 - Is "regulatory symmetry" between broadcasting and new media undertakings a desirable, necessary or achievable objective?
 - Do policymakers need to choose between, or prioritize, the different objectives in the Act?
 - Should policy makers invest additional resources into monitoring developments in the evolution, contribution and impact of audio-visual technologies?
 - Should the Government consider new subsidy approaches and/or legislative reform outside the Act?
 - Within what time frame do policy makers need to act?
409. The Commission addresses each of these questions below.

i. The *Broadcasting Act* and its objectives

410. As noted in section B of these concluding observations, the majority of parties took the position that the current Act remains relevant and appropriate. Three parties did however call for legislative changes.
411. From the perspective of carrying out its mandate, the Commission is satisfied that the current Act continues to allow it to appropriately address the issues facing the broadcasting system, at least for the near to medium term. The Act provides a broad scope for inclusion of new audio-visual technologies and an equally broad discretion to determine the appropriate degree of regulatory oversight, if any. Moreover, the Act allows the Commission to adjust the degree of regulatory oversight and contributions of licensed undertakings, as appropriate.
412. This does not diminish the significance of the regulatory issues facing the broadcasting system; but does suggest that, should the Government so decide, such issues can be effectively addressed under the current Act.
413. Ultimately, it is for the Government to decide whether the *broadcasting policy* and *regulatory policy* objectives of the Act remain relevant to the system as a whole and appropriate in light of the new technologies.

414. As discussed in section C above, the vast majority of parties expressed support for or acceptance of the section 3 *broadcasting policy* objectives of the Act. If, however, Government were to conclude that the broadcasting policy objectives are not appropriate for the new media, new legislation would appear to be the best means by which such policies could be clarified.
415. Parties did have significant differences of opinion as to the weight, priority and effect given to implementing the broadcasting policy objectives, as reflected in the crafting or interpretation of section 5 *regulatory policy* objectives. For example, on the one hand, cultural groups took the position that cultural objectives, such as appropriate “contribution” and the “predominant use” of Canadian creative resources (subparagraph 3(1)(e) and 3(1)(f)) should be paramount. On the other hand, distributors largely argued for a greater emphasis on economic objectives and the need for innovation as (subparagraph 3(1)(d)(iv), paragraph 5(2)(c) and paragraph 5(2)(f)).
416. A clear question for the Government is, therefore, whether the section 5 *regulatory policy* objectives, introduced in the 1991 Act, remain useful and appropriate, or should be amended or prioritized. If the Government were to conclude that greater clarity should be given to the priority accorded certain broadcasting or regulatory policy objectives, an appropriate means of doing so could be to amend the regulatory policy objectives set out in subsection 5(2), and the priorities established under subsection 5(3). Policy direction, under section 7 of the Act, would also be a means by which Government could establish certain priorities, consistent with the current Act.

ii. Regulatory symmetry

417. For over half a century, the regulatory frameworks of the Canadian broadcasting system have been able to accommodate each new wave of audio-visual technology that manifests itself in a new or updated broadcast platform by establishing a new and distinctive class of broadcasting undertaking. Each class of undertaking would then have general Canadian content and other regulatory rules applied to it; each individual undertaking within a class having the potential for further unique regulatory requirements.
418. Similar or “symmetric” regulatory rules have generally been necessary and desirable between undertakings in the same class, in order to ensure equitable regulation. For different classes of undertakings, however, regulatory symmetry has neither been necessary nor the norm. While different classes of undertakings may well affect each other, they have historically been distinctive enough to permit significant differences in regulatory approach.
419. The Commission notes in this regard that the Act includes the important concept of technological neutrality. This has enabled the regulator to leverage new technologies, as they are introduced, so that they serve the objectives of the Act to the maximum degree.

420. The fundamental change with today's new audio-visual technologies is that they have the potential to become replacements for regulated undertakings. At present, the Internet, because of technical limitations, is not well suited for real-time television broadcasting. However, as the CRC noted in its submission, this could change as technological improvements are introduced that will allow the Internet to support real-time applications. Should this become the case, the issue of regulatory symmetry will need to be addressed.

iii. Choosing between conflicting policy objectives

421. The Commission considers that new audio-visual technologies have the potential to further many, if not all, of the objectives of the Act.
422. The Commission agrees, for example, with parties involved in distribution that the Act's objectives for a variety of and diversity in high quality programming from international sources are already being advanced through new audio-visual technologies. The Internet and other new digital technologies are providing greatly expanded choice for Canadians through the expanded capacity of digital broadcast distribution undertakings and Internet access to foreign web sites such as BBC.com and JumpTV.com.
423. Other social and economic objectives, including issues of access, encouragement of expression and adaptability to scientific and technological change, would also appear to be furthered through the application of new audio-visual technologies.
424. Finally, as discussed above, the provision, on the Internet and mobile platforms, of important Canadian programming such as local, regional and national news, also shows evidence of being advanced at the present time, without regulatory intervention.
425. Nevertheless, the Act has always had differing – and sometimes conflicting – objectives. For example, under subsection 3(1)(s), private broadcasters are expected to “contribute significantly” to Canadian programming while, at the same time, being “responsive to the evolving demands of the public”, including a demand for foreign programming. Indeed, one of the principal roles of the Commission has always been to balance such differing objectives, often manifesting themselves in the competing interests of broadcasters, distributors and the creative sector.
426. Perhaps the biggest – and an ever increasing – challenge for policy makers, however, is in balancing the interests of Canadians as consumers and citizens. The Commission fully appreciates the evolving desires and needs of Canadian consumers for access to content anywhere, anytime, anyplace. Nevertheless, the current Act addresses Canadians not just as consumers of broadcasting, but also as citizens. Absent amendment or evidence to the contrary, the Commission must also, for example, find ways to ensure the system continues to “safeguard, enrich and strengthen the cultural, political, social and economic fabric of Canada”. It is the role of Government and the regulator to ensure that the Canadian broadcasting system provides Canadians with the tools they need to exercise their responsibilities as citizens.

427. It would therefore seem unrealistic for policy makers to expect that new audio-visual technologies will continue to advance all of the Act's objectives, particularly those in the cultural area, without public policy intervention. As a consequence, policy makers will either be increasingly called upon to choose as greater priorities those objectives that new audio-visual technologies more naturally advance, or find new ways to intervene in support of the remaining objectives.
428. Support for drama and other high quality expensive content is one such example. In light of the fact that such content is only beginning to be made broadly available on new Internet and mobile technologies, there is little evidence to date of the impact such new audio-visual technologies will have on Canadian content in this category. Given the economic challenges that distinctive, high quality, expensive Canadian content has historically faced, however, the Commission considers that public policy interventions in support of this Canadian content category will ultimately be necessary if the Act's cultural objectives in this area are to be met to the same or greater extent.

iv. Monitoring

429. Policy decisions should be based on the most relevant, accurate data available. Unfortunately, this process has shown that there is a wide variation in the usage data available for key platforms, such as Canadians' use of the Internet, and no useful data at all in other important usage sub-categories, such as the presence of Canadian content on the Internet.
430. Detailed ongoing monitoring of developments in the evolution, contribution and impact of audio-visual technologies is vital. The Commission considers that the meaningful, reliable tracking of Internet, mobile and other new audio-visual technology use, including information on the consumption of Canadian content, and evidence of the extent to which such content could be provided by traditional broadcasters, to be essential baseline data.
431. The Commission will continue to enhance its monitoring efforts in this regard, but notes that additional resources may well need to be brought to bear to ensure that reliable, relevant and comprehensive data is made available.

v. When to act

432. Calls for policy action reflected in the submissions focused largely on three different areas:
- Amendments to the regulatory frameworks of existing broadcasting undertakings;
 - Determination of regulatory oversight, if any, appropriate to new audio-visual technologies; and

- Additional public policy response in areas such as copyright, maintenance of a distinct Canadian rights market, and new targeted subsidies.

433. In the Commission's view, given the evidence of this proceeding with respect to the speed and acceptance of technological change, it would be prudent for policy makers to assume that a potential for material economic impact on broadcasting undertakings exists over the medium term.
434. Accordingly, the Commission considers that within the next three to seven years, public policy action will need to be taken if it is to have the desired effect. Corrective action taken beyond this time may be ineffective.

vi. Approaches and/or legislative reform outside the *Broadcasting Act*

435. As noted in section H above, issues such as incentives for infrastructure, reallocation and/or increased subsidy programs, copyright and the integrity of the Canadian rights market are among the policy matters raised by parties that either fall outside the Commission's jurisdiction or can also be addressed by bodies other than itself.
436. While the Commission does not consider it appropriate to comment on the merits of specific proposals, it notes that the achievement of the objectives of the Act does not rest solely on its own regulatory actions.

K. The Commission's approach

437. In fulfilling its mandate under the Act, the Commission is required on an ongoing basis to address regulatory issues associated with the introduction and impact of new audio-visual technologies.
438. The Commission plans to address these regulatory issues over the near term in the following ways:
- The Commission will continue and, as resources permit, expand both its ongoing general monitoring of the broadcasting system, and developments in the evolution, contribution and impact of new audio-visual technologies.
 - Between 2006 and 2008, the Commission will conduct reviews of its regulatory frameworks for radio, television, and distribution undertakings, with particular focus on the current and anticipated impact of technological change. Specifically, the Commission has or will have addressed:
 - the policy framework governing the migration of analog pay and specialty services to a digital and HD distribution environment (released in February 2006),

- the impact of technological changes on its regulatory policies with respect to commercial radio undertakings (decision pending),
 - aspects of the regulatory framework for over-the-air television (oral hearing November 2006),
 - the licensing framework for pay, specialty and VOD services (planned for 2007), and
 - the regulatory framework for BDUs (also planned for 2007).
- The Commission will continue to seek ways to reduce unnecessary regulatory burden, including licensee reporting requirements, and to ensure that regulatory measures are as effective and efficient as possible.

439. The record of this proceeding confirms the Commission's view, as expressed in Public Notice 2006-47, that current circumstances do not warrant an immediate review of the new media exemption order, the Commission intends to continue to monitor this area closely. Evidence of material impact on existing broadcasting undertakings and/or insufficient or decreasing Canadian presence would be changes in circumstance that would likely warrant a future review.

440. Like the Governor in Council, the Commission believes that the Canadian broadcasting system, using various audio-visual technologies, must remain relevant in a global digital environment and must meet the diverse needs of Canadian men, women and children of all cultures. The Commission considers that the gathering of information for this report is an important step in ensuring that policy-makers make the decisions necessary to ensure the ongoing health, contribution and relevance of the Canadian broadcasting system.

Appendix 1

An overview of the various technologies used for the transmission and distribution of broadcast services

A. Radio

A.1. AM band

1. The AM band (525/535 kHz – 1605/1705 kHz), developed in the 1920s, has a number of technological limitations. It is a monophonic service with a relatively narrow bandwidth – 20 kHz – which constrains its ability to deliver music with true high fidelity. Many AM stations use highly directional antenna arrays, which often place further restrictions on the realized bandwidth and coverage. In addition, certain broadcasters compromise their music quality by limiting the dynamic range of their signals in order to sound louder on the dial. An AM stereo technology was developed some years ago but was never widely adopted.
2. AM coverage is provided by two means: ground wave and skywave. Ground wave signals propagate best in areas of high ground conductivity, such as the Prairies and over sea water. Skywave signals are signals that are reflected off the ionosphere at night. While they enable radio reception over great distances in the absence of competing signals, they also cause interference over these same distances. For this reason, most AM stations broadcast with a broad antenna pattern during daylight hours and a more restrictive antenna pattern during the hours of darkness.
3. AM stations are licensed by class. The largest are Class A stations, which have an output power of 50 kilowatts using omnidirectional antennas. Class A stations provide wide area coverage both day and night. Although the skywave coverage areas of Class A stations are not fully protected, some US stations enjoy de facto protection because the stations are grouped in contiguous bands. Class B stations may also transmit as much as 50 kilowatts; Class C stations are limited to one kilowatt. The coverage of Class B and C stations is limited, particularly at night when skywave interference reduces coverage to the urban cores. There is also a low-power, unprotected class.
4. With their multi-tower arrays, AM transmitter sites are generally quite large. Their site location is often critical because the antenna patterns are highly directional in order to meet protection requirements. The patterns must provide a specified minimum field strength over their principal urban markets and, at the same time, ensure that their maximum signal levels do not exceed certain values. Urban sprawl has encircled many AM sites and, as a consequence, significant changes to the tower arrays can no longer be undertaken.

5. Given these limitations, some broadcasters have shut down their AM facilities and now transmit on FM. In some cases, the shutdowns have allowed other Canadian stations and broadcasters who have the site flexibility and the financial means, to expand their service areas into these previously protected areas.
6. Until recently, it was anticipated that, over the long term, the AM band would be phased out in whole or in part, although it was thought that it might be worthwhile to retain the Class A, clear channel stations with their wide area coverage.¹ However, the introduction of in-band on-channel (IBOC) or some other digital technology might well give the AM service a new life. Unfortunately, the success or failure of IBOC will not be known for some time, but the prospect does call into question the service replacement model used for the licensing of the L-band digital radio services.

A.2. FM band

7. The FM band (88 MHz – 108 MHz) offers many technological advantages over the AM band. There is adequate bandwidth - 200 kHz - to deliver an excellent music service, coverage is consistent day and night and the antennas are much smaller.² In view of its technical merits and current popularity, it is unlikely that the analog FM band will be shut down anytime soon.
8. The issues surrounding the FM band pertain to spectrum congestion and to the introduction of IBOC technology. Spectrum is virtually exhausted in most of the major Canadian markets. Of the few open allotments remaining, most are protection limited. Drop-in frequencies are also scarce. Again, most are protection limited and many are subject to excessive interference. Essentially, there is no room to accommodate future services.
9. A few broadcasters have taken to using related channel drop-ins to extend their service areas. These drop-in frequencies are short-spaced to their principal assignments and, as a consequence, a certain amount of interference can be expected. While degrading an existing service area is an unfortunate trade-off, nothing else is available to remedy the coverage shortfalls. Furthermore, under the current allocation rules, only the existing broadcaster can use the drop-in frequency because the Department of Industry (the Department) offers that broadcaster the choice of whether to accept interference should another broadcaster apply to use that drop-in. Needless to say, the existing broadcaster would not accept such interference from a competitor who attempted to use the drop-in frequency. The new competitor and the existing broadcaster would have different service objectives for the drop-in frequency. Hence, the potential interference of the two installations could differ considerably. Moreover, interference is location and receiver

¹ In fact, it might even be possible to convert a few of the Class B stations to Class A if all of the remaining Class B and C stations were shut down. This could be one of the options to consider should the Department of Industry undertake a re-planning of the band.

² For AM, each tower is an element of the antenna; for FM, the antenna is a discrete piece of equipment that is hung on or placed atop a tower.

dependent, and will be greatest where the ratio of the undesired signal to the desired signal is the highest, i.e., near the offending transmitter site. High-end receivers with selective tuners can reject much of this interference, but low-end receivers are much less capable of doing so. Unfortunately, there are no receiver standards, so manufacturers are free to produce whatever they think the market will accept.

10. The introduction of IBOC technology in the FM band will not cause the same degree of interference as it will in the AM band. An FM channel is 200 kHz wide as opposed to AM's 20 kHz, and FM service is not subject to skywave interference. In addition, much more information can be transmitted on the FM band. Accordingly, IBOC technology may also present opportunities to introduce service enhancements, such as five-channel surround sound, to FM services.

A.3. L-band

11. Given the technical limitations of the analog AM and FM bands and the increasing spectrum congestion in the major markets, it was determined that the future of radio lay in the adoption of digital technology and the development of a new frequency band.
12. Specifically, digital radio broadcasting (DRB) is a new digital radio service that uses the Eureka-147 digital audio broadcasting (DAB) transmission standard at 1452 MHz – 1492 MHz of the L-band. There are 23 channels in the band, although outside of the Windsor-Québec corridor, the top six channels may be subject to interference. The allocation plan is based on the service replacement model wherein every AM and FM station in the country was allocated a digital channel with equivalent coverage to the analog service. Five stations share each digital transmitter, which uses less power than its analog counterpart. Further, on-channel repeaters can extend the digital service areas. The audio quality is comparable to CD and there is capacity for both program-related and non-program-related data.
13. On 29 October 1995, the Commission issued *A policy to govern the introduction of digital radio*, Public Notice CRTC 1995-184. Because digital radio in Canada was in the early experimental stage, the Commission set out a two-staged approach. In the short term, the Commission would establish a process for licensing digital radio services on a transitional basis. Later, it would undertake a public process to consider all aspects of DRB in the longer term.
14. To allow for the establishment and introduction of a permanent licensing system for digital radio undertakings, the Commission determined that transitional digital radio licences would be issued for a term of three years. The Commission also stated that it considered digital radio a replacement technology for existing AM and FM radio services. It further noted that digital radio has the potential to increase the diversity of programming services available to the public. For this reason, the Commission decided that existing radio services would have priority access, but not exclusive access, to the digital band.

15. Since licensing Canada's first digital radio stations in 1998, the Commission has granted transitional digital radio licences to many existing AM and FM licensees in Toronto, Windsor, Montréal, Vancouver, Victoria and Ottawa. Currently, over 60 digital radio stations are on-air in Canada. All are rebroadcasting existing analog programming services. Unfortunately, however, after a promising start, the roll-out of digital radio has largely stalled.
16. There is general agreement that the slow public acceptance of L-band digital radio is the result of a lack of attractive new digital services, and of the high cost and technical quality of receivers. Contrary to the hopes of government and industry, improved technical quality has not been enough to drive consumer demand for the digital services; new, innovative services are needed. It may also be necessary to take steps to ensure that suitable L-band receivers are available at reasonable prices in the licensed markets.

A new compression standard

17. When the original Eureka compression standard was set in the early 1990s, audio compression was in its infancy. During the last 15 years or so, we have seen significant advances in compression hardware and software. Recently, in fact, a number of international sources have announced that an update of the Eureka-147 standard is imminent.
18. The new standard will incorporate the MPEG-4 audio codecs advanced audio coding (AAC) (the successor to the MP3) and high efficiency AAC (HE AAC) into the DAB system. They require a far lower bit rate to encode audio to a given level of quality compared to the MP2 codecs currently used for DAB. AAC is twice as efficient as MP2 and HE AAC is about three times as efficient as MP2. Consequently, next generation transmissions will be much more robust than today's transmissions on DAB. Moreover, the new technology will allow a DAB multiplex to carry significantly more information, thus allowing radio stations to provide far higher audio quality and/or about twice as many programming services. However, the new standard is not backwards compatible; new receivers will be needed to realize these efficiency gains.
19. In Canada, digital receiver penetration remains very low. The absence of an established base of L-band receivers means that there is no real impediment to the adoption of the new version 2 standard, at least from the listener's side.

A.4. In-band on-channel (IBOC)

20. The IBOC system is a proprietary technology that is being introduced in the United States to convert AM and FM stations from analog to digital. It is not backwards compatible and, therefore, listeners must purchase new receivers. Its development and deployment is being followed by the industry and a number of Canadian broadcasters have suggested that it be considered for adoption here as well.

21. In technical terms, the digital signal occupies the sidebands above and below the center analog frequency. The AM or FM station's digital signal is then transmitted along with the existing analog signal. Existing receivers continue to receive only the analog signal while new receivers receive both the analog and digital signals. If the digital signal cannot be decoded or is lost, the receiver will automatically switch back to the analog signal. For this reason, the analog and digital signals must be the same. Accordingly, unless this switch back feature is disabled, IBOC can only be licensed as a replacement technology.
22. Nevertheless, it is possible to segment the data stream and incorporate a second audio service, if a broadcaster is willing to accept lower quality on both digital services. This second digital service will have a much reduced service area compared to that of the first digital service. The second digital signal is transmitted at a lower power to reduce interference and it cannot switch back to a duplicate analog signal.
23. IBOC technology requires no new spectrum and squeezes the digital signals within the existing AM and FM radio bands. While it is possible to place digital sub-carriers on the shoulders of an AM or FM signal, a number of important technical compromises must be made. These compromises raise questions as to the quality of the digital programming that can be delivered, the usable data rate of the non-programming component, the effective coverage of both the analog and digital signals, the impact on the quality of the analog signal and the increased potential for interference to adjacent channels. Because of its narrower bandwidth, the technical compromises are more severe in the AM band, particularly at night because of skywave interference. In fact, a full-time AM IBOC system may not be practical unless certain technical compromises are made in the performance parameters.
24. Some Canadian broadcasters are considering IBOC in spite of the concerns described above. As noted above, IBOC would degrade existing services somewhat, both from adjacent channel interference as well as from increased co-channel noise during the transition period when both the analog and digital services are operating together. The technical compromises in the FM band, however, are not as severe as they are in the AM band. A commercially acceptable FM service should be possible. In either case, the IBOC technology does provide a means to transition existing AM and FM analog services to digital without the need to develop a new frequency band.
25. Unfortunately, the limitations of IBOC technology affect not only the broadcaster using it but also adjacent channel stations in nearby markets because the latter receive interference from the digital signals placed on the shoulders of the IBOC station.³ Consequently, the decision to adopt IBOC involves more than an

³ While there have been reports of adjacent channel interference from FM stations carrying IBOC signals, the stations in question have not been shut down.

individual broadcaster's evaluation of the benefits and limitations that the technology affords. Because of the wording of the existing international agreements and our own domestic standards, the Department must first evaluate the impact of the technology on the Canadian broadcasting system as a whole before deciding whether or not to adopt the IBOC standard for Canada.

Re-planning the AM band

26. The roll-out of IBOC has introduced a number of interference problems, particularly in the AM band. In fact, the AM night-time interference has been so severe that only daytime digital operations are permitted in that band. These daytime and night-time interference problems have led the National Radio Systems Committee (NRSC) to create an AM Study Task Group to study whether the audio bandwidth specifications for AM stations should be revised. A decrease across the board in analog bandwidth would reduce the adjacent channel interference problems discussed above, which in turn would expedite the roll-out of iBiquity's⁴ IBOC system. However, any bandwidth reduction would, of course, reduce the quality of the AM analog service. The study group is currently examining the various trade-offs between the analog and digital services. Any re-planning of the AM band in the United States would, of necessity, involve Canada and Mexico.

A.5. Digital Radio Mondiale (DRM)

27. Digital Radio Mondiale (DRM) is a non-proprietary, worldwide standard for the introduction of digital technology in the analog broadcasting bands.

a) Background

28. The DRM Consortium was formally created in 1998 as a not-for-profit organization with the stated objective "to create a universal, digital system for the AM (amplitude modulation) broadcasting bands below 30 MHz." Its objective was to be accomplished through the creation of an open, non-proprietary worldwide standard for broadcasting in the low frequency (LF), medium frequency (MF) and high frequency (HF)⁵ bands. As of June 2005, the consortium had 89 members from 29 countries. The Canadian members are Radio Canada International (RCI) and Nautel Ltd. At one time, when the leading IBOC proponent, USA Digital Radio, joined the consortium, there was promise of a unified, worldwide standard. However, USA Digital Radio subsequently joined Lucent Digital Radio Inc. to form iBiquity and withdrew from the DRM Consortium in 2000.

⁴ iBiquity is the inventor and developer of the IBOC technology used for the digital radio transition in the United States. The company is a result of a merger of USA Digital Radio and Lucent Digital Radio Inc., and includes ABC, Clear Channel, CBS, Harris, Texas Instruments and Visteon as investors.

⁵ The LF band extends from 30 kHz to 300 kHz, the MF band from 300 kHz to 3 MHz and the HF band from 3 MHz to 30 MHz. In Canada, the AM radio service occupies roughly the bottom half of the MF band.

b) Technical description

29. DRM has been described as a toolbox for digital broadcasting below 30 MHz because a number of different parameters can be changed to optimize the system for a given environment. Many of these parameters can even be changed dynamically to allow adaptation to changing conditions. All DRM systems have some common elements so as to enable receivers to easily recognize what services are present and how to decode them. Since DRM is intended to be a worldwide standard, it must accommodate all of the channel arrangements in use in the LF, MF, and HF bands.

c) Advantages of DRM technology

30. The main advantage of DRM technology is that it can deliver audio over long-wave, medium-wave and short-wave frequencies and distances at a level of quality, which at its best, is comparable to FM radio broadcasts. In particular, DRM is robust when combatting the effects of fading and interference. As a digital medium, DRM can also transmit digital data other than digitized music, including text, pictures, and computer programs (datacasting), as well as radio data system (RDS)-type metadata or program-associated data. DRM has been designed especially to use older transmitters designed for analog AM, such that major new investments are not required for early adopters. The encoding and decoding can be performed with digital signal processing, so that small computers added to a conventional transmitter and receiver can perform the complex encoding and decoding.
31. Compared to AM broadcasting, DRM is very scalable and, thus, allows the broadcaster to optimize his or her particular combination of transmitter power, targeted service area, frequency and program material. All these parameters are transparent for the listener because they are automatically handled by the receiver.

d) Further developments

32. While DRM currently covers the broadcasting bands below 30 MHz, the DRM Consortium voted in March 2005 to begin the process of extending the system to the broadcasting bands up to 120 MHz. This technology will be called DRM Plus (DRM+). Wider bandwidth channels will be used, which will allow radio stations to use higher bit rate, thus providing higher audio quality. One of the new channel bandwidths that is likely to be specified is 50 kHz, which will allow DRM+ to carry radio stations at near CD quality. The design, development and testing phases of DRM+, which are currently being conducted by the DRM Consortium, are expected to be completed between 2007 and 2009.

A.6. Satellite subscription radio

33. Satellite Digital Audio Radio Service (S-DARS) was introduced in Canada in 2005 in the S-band. Canadian Satellite Radio's (CSR's) and Sirius Canada's undertakings are satellite-based, multi-channel subscription radio systems based on partnerships with two American companies, XM and Sirius. The two companies use different technologies for both their satellite systems and their supporting terrestrial rebroadcasters.
34. XM uses two geostationary satellites, which are similar in some ways to the direct broadcast satellites used by television undertakings to serve their subscribers. They are large, relatively powerful satellites, built with well-established technologies. The two satellites are located in different orbital slots, one at 85 degrees west and the other at 115 degrees west; their positions are fixed relative to an observer on the ground. Each of the two satellites transmits the same signal but in different frequency bands (S-band frequencies 2332.5 MHz – 2336.5 MHz and 2341.0 MHz – 2345.0 MHz; each of the satellite slots has a bandwidth of 1.84 MHz). Telesat Canada provides the station-keeping services for the two satellites.
35. Sirius uses three non-geostationary satellites, which are in a highly elliptical orbit around the earth – the earth being at one of the focal points of the ellipse. As a result of the orbit, the Sirius satellites have an average reception angle (also called look angle) of about 60 degrees, which is significantly higher than that of the geostationary satellites used by XM. With these higher elevation angles, the Sirius signals are less susceptible to blockage from obstacles on the ground. Furthermore, the near-earth orbit results in a much shorter transmission path, which permits the use of lower power, more cost-effective satellites. Because only two frequency bands are set aside for the satellite signals (S-band frequencies 2320 MHz – 2324.0 MHz and 2328.5 MHz – 2332.5 MHz), only two of the three satellites can transmit at any given time.⁶
36. Both CSR and Sirius Canada are constructing a network of ground-based transmitters to rebroadcast their satellite signals into hard-to-reach areas, such as urban cores, steep valleys, and tunnels. CSR has plans to install 18 high-power and 100 low-power transmitters in 15 urban centres and 8 traffic corridors across Canada. Sirius Canada will use a much more limited number of higher power transmitters, specifically, one transmitter in each of nine major markets. Before the transmitters are installed, however, field strength measurements will be taken to define the limits of the satellite coverage.
37. The current satellite systems offer limited capacity, but the next generation of satellite technologies and signal processing capabilities could increase the capacity if there is a commercial need.

⁶ Otherwise, two of the satellites would have to transmit in the same frequency band and would therefore interfere with one another. To avoid this problem as the satellites rise and set, a "hand-off" occurs between them: the setting satellite ceases transmission and the rising satellite initiates transmission.

A.7. Digital Multimedia Broadcasting (DMB)

38. Digital Multimedia Broadcasting (DMB) technologies can be used to distribute audio as well as video and data services. These technologies are discussed in detail in the “Television” section below.

A.8. Audio Streaming

39. Audio streaming, or more generally, media streaming, is a set of technologies that permits the delivery of audio, video or animation over the Internet in real time.
40. Using media streaming technologies instead of conventional broadcast transmitters or receivers, a PC can download a radio or television program from a server, i.e., a webcaster. Media streaming technology allows the user to listen or watch without being limited by typical transmission constraints such as contour limits and spectrum availability. Proper streaming technologies coupled with efficient audio coding techniques, plus the virtually unlimited reach of the Internet have made webcasting a favourite for many listeners who can tune in to stations that are continents or oceans away and are otherwise unreachable through traditional means.

MP3

41. One supporting technology is called MP3. Essentially, an MP3 file is an audio track that has been compressed using the MPEG-3 (motion picture experts group audio layer-3) compression algorithm and some proprietary encoding software. The storage gains are substantial. An average three-minute song stored on a CD takes up slightly more than 30 MB; the same song in MP3 format takes up around 1.5 MB. Some sound quality is lost, however. While MP3 is the most popular audio compression technology, others are available, including Windows Media Audio file (WMA), AAC, MP3 Variable Bit Rate (MP3 VBR), Audible (proprietary for eBooks) and Audio Interchange File Format – for use with Mac only (AIFF).
42. The current version of MP3 was originally intended for use with high definition television (HDTV) systems, but the popularity of the Internet and file sharing networks soon gave MP3 a new use: digital music storage, playback and downloading. The advantages of MP3 players are many. They are simple to use, their sound quality is better than that of cassettes, and they are small in size (smaller than portable CD players). It is also much faster to load an MP3 player than it is to record a cassette or burn a CD. It is easier to create an MP3 playlist of favourite songs than it is to create a mixed tape. It is also possible to load music directly from the Internet to an MP3 player. In general, MP3 players also have much longer battery lives than other portable music players.

43. Some portable MP3 players have internal flash memory, some have removable memory, some have both; some have small hard drives while others play MP3 files from CD-R (CD-Recordable) or CD-RW (CD-rewritable). Most MP3 players can also store data other than MP3 files and can be connected directly to computers.

Podcasting

44. With digital compression and Internet delivery, as well as the introduction of portable media players with large memories, came podcasting, an enabling technology for the creation of personal audio programs. A podcast is essentially the audio version of a weblog. The term is a fusion of the terms “broadcasting” and “iPod.” The audio material is compressed and the resulting file is stored on a Web site. With the help of the content delivery system known as Really Simple Syndication (RSS) and media aggregators (companies that seek out and deliver audio files to subscribers), users can download this material from the Web to their computers or portable devices at any time and listen at their convenience. These audio files can be played back on any brand of MP3 player with enough capacity or simply on a user’s computer.
45. According to a recent report, more than 4,300 different podcasts covering a variety of subjects already exist around the world, and the number of listeners is on the rise. A report released at the end of March by Washington, D.C.-based Pew Internet and American Life Project estimated that more than 6 million Americans – nearly 30 percent of the 22 million adults who own MP3 players – have listened to podcasts. (Sceptics have questioned the sample size and have suggested that usage may be significantly lower.)
46. In addition to individual operators, professional broadcasters such as the BBC, the CBC and National Public Radio in the United States have established podcast Web sites.
47. Just recently, Apple has integrated enabling “podcasting” software into its latest release of iTunes, the jukebox software that accompanies the iPod. Finding and subscribing to podcasts, once a complex, is now simple. With the new software, one click takes users to a page of podcasts on offer, from public radio shows to the eccentric ramblings of some users, and another click sets up the subscription. Podcasts are then automatically transferred to the iPod when it is connected to a computer.

iRadio

48. iRadio is a subscription-based service that proposes to extend the reach of Web radio, which is currently confined to computers (PCs and laptops) connected to high-speed Internet, by adding a mobility dimension. Users will be able to play their own selection of songs such as MP3s as well as podcasts from affiliated Web radios. This service is limited to Motorola handsets, which are iRadio-enabled. Bluetooth accessories to connect the iRadio-enabled device to a home stereo system, a car stereo system or Bluetooth-enabled headphones should eventually be available on most handsets.

49. The user downloads custom software from Motorola onto the PC or laptop to access a minimum of 200 available Web radio channels that have signed on as content providers for the Motorola iRadio service. Motorola plans to eventually have up to 435 Web radio channels available to their customers.
50. With this custom software, the user selects the Web radio channels to download onto the handset. When the desired web radio channel(s) has been selected, the user connects the device, through a USB connection, to the PC (or laptop) and downloads the program(s). The user uploads the previous night's radio programs onto his or her device and then listens to the contents during the day. Although it is not possible to find exactly how much memory a device has to play lengthy music programs, we can assume that the iRadio-enabled devices would need as much memory as today's iPod Nano. With 1 to 2 GB of memory, the iRadio-enabled device could play up to 10 hours or 600 minutes of music. At four minutes per song, the device would have the potential to play 240 songs.
51. A planned radio transmission component, which will be provided by network operators, will comprise news, traffic, weather and sports reports. This information will be sent over the airwaves from base stations to iRadio-enabled devices using conventional mobile networks.

A.9. Software defined receiver (SDR)

52. A person living in a city today could be using a radio receiver for AM and FM services, another for the CSR or the Sirius Canada satellite subscription service and one for L-band DAB. This person probably also carries a cellular phone with an MP3 player. To receive all of the available services in the areas where he or she lives and travels, a more practical solution for the consumer would be to have one multifunction, multi-service, multi-standard device instead of many redundant devices that all have batteries, memory, dial and display, audio system, etc.
53. Currently, receivers are designed and built for specific broadcast technologies. If a new technology is introduced, listeners must equip themselves with receivers that incorporate that technology. Given the proliferation of new technologies in recent years, it has become increasingly apparent that what is needed are receivers that can be readily upgraded over the course of their lifetimes to accommodate new broadcast standards as they emerge. Receiver manufacturers have recognized this growing requirement and a number of them are developing multi-standard integrated circuits. Organizations such as WorldDAB and the DRM Forum have agreed to collaborate and encourage manufacturers to put both DAB and DRM technologies in their receivers. Such receivers, called software defined receivers (SDR), bring integration a step forward by proposing a generic hardware architecture where users download specific software for the reception, processing and playback of signals transmitted using the various transmission standards.

54. This vision of a multi-standard handheld receiver carries some significant technical challenges, including:
- high power consumption and limited battery power;
 - extensive processing power requirement;
 - antenna gain or loss;
 - size, picture resolution and brightness in daylight of colour displays;
 - poor operation at low temperatures;
 - voice command capability in noisy environments; and
 - complexity and cost.
55. Nevertheless, a lot of progress is being made in the development of SDR technology, but its applicability is currently limited to professional radio systems such as military, public safety and base stations. The power consumption of a reconfigurable all-digital signal processing radio is still too large for small handheld devices. In the meantime, it will take some years before this technology finds its way to the consumer market.

B. Television

B.1. Analog over-the-air – The National Television System Committee (NTSC) transmission standard

a) Technology

56. The National Television System Committee (NTSC) transmission standard is the analog television system in use in Canada, the United States, Japan, South Korea and a number of other countries, mostly in the Americas.
57. An NTSC television signal occupies a total bandwidth of 6 MHz to transmit one channel over the air to viewers. The signal is displayed at a screen resolution of 640 horizontal picture elements x 480 vertical lines in interlace format. It has a refresh frequency of 59.94 Hz and a luminance-chrominance colour encoding system that is backwards compatible with black and white sets.
58. How far an over-the-air television signal travels depends on the frequency (low VHF channels propagate better than high UHF channels), the transmitter power, the antenna gain and the effective height of the antenna. Two contours or values of received signal strength are important. The grade A service contour – the city grade service – assumes the use of an indoor antenna and a high noise environment. The grade B service contour – the rural grade and the practical limit of the service – assumes the use of an outdoor, high gain antenna and a low noise environment.

- 59. At the receiver end, demodulation occurs. The information is extracted from the carrier wave, processed and displayed on the screen for the viewer.
- 60. There are technical limits to the performance of television receivers. For example, they have difficulty extracting weak signals in the presence of strong signals on immediately adjacent channels. For this reason, the use of a particular channel in a market precludes the use of a number of other channels in that market and in adjacent markets.

b) Spectrum allocations

- 61. The frequencies allocated to television broadcasting are designated by a channel number. The following spectrum is currently set aside for television broadcasting:

Band	Channel	Frequency (MHz)
VHF	2 to 4 inclusive	54-72
VHF	5 and 6	76-88
VHF	7 to 13 inclusive	174-216
UHF	14 to 69 inclusive	470-806

- 62. It is anticipated, however, that the digital transition will reduce the television broadcasting spectrum in both the short and long term. In addition, low band VHF channels 2 to 6 will likely not prove suitable for use by digital television services, at least in urban areas. This freed-up spectrum will be re-assigned to non-broadcast users for purposes such as land mobile and public safety.
- 63. The NTSC system reflects the technology that was available when the standard was adopted, some 65 years ago. Reception conditions can change the phase of the colour signal, altering the picture’s colour balance. The standard’s limited resolution also reflects the original technology. Even so, the system’s compatibility and flexibility have been the key to its longevity and ubiquity over seven decades.

B.2. Digital over-the-air television – The Advanced Television Systems Committee (ATSC) A/53 transmission standard

a) Technology

- 64. Digital television is an over-the-air transmission system designed to replace the current analog, NTSC broadcast system. The Advanced Television Systems Committee (ATSC), established in 1982, developed the ATSC A/53 digital television (DTV) transmission standard (the A/53 standard) based on this new transmission system. The A/53 standard is part of a family of standards. Every viewer will need a digital set or at least a set-top converter to receive these digital transmissions.
- 65. The A/53 standard provides a large data pipeline that can support a variety of applications. For example, in a 6 MHz off-air channel, which delivers approximately 19 Mbps, a broadcaster can transmit one high definition (HD) program stream, two medium definition program streams or up to five standard definition (SD) streams, as

well as some associated data. As for audio, the associated standard, A/52, allows the transport of up to five channels of sound with a sixth channel for low-frequency effects (known as the 5.1 configuration). The flexibility to create different combinations is a key benefit of the A/53 standard.

66. The A/53 standard has two main advantages. First, because of compression, the standard permits the transmission of HD programming in the same size broadcast channel as the channel that now carries low definition analog programming. HD is the first significant improvement since the introduction of colour. Second, digital transmissions degrade fewer adjacent channels than analog transmissions; more channels can therefore be used in any particular market more efficiently. The Federal Communications Commission (FCC) has consequently compelled broadcasters in the United States to construct digital facilities and, in 2009, to shut down their analog transmissions. Once the analog transmissions are turned off, the upper UHF band will be cleared. This freed-up spectrum can then be (and in some cases, has already been) auctioned off to mobile phone companies and other non-broadcast users.
67. England went through such a transition in the early days of television when they replaced their original 405 line standard with a 625 line standard. Introducing a better system was well received. But in spite of an ambitious schedule, it was many years before the 405 system was finally turned off.
68. The A/53 standard does not include cable or satellite and these new signals will present distributors with some problems and costs.
69. To date, Canada, the United States, Mexico, Taiwan and South Korea have all adopted the A/53 standard. A number of other countries are also considering it.

b) Digital compression

70. Compression technology and the limitations of the human eye have made digital television possible.
71. Obtaining a perfect reproduction of a picture image requires a tremendous amount of bandwidth, which directly affects the costs of processing, storage and distribution. Furthermore, in the case of off-air distribution, there simply is not enough spectrum available at any price to accommodate uncompressed HD video. Although it is possible to compress a digital signal without losing any information, the data reductions are usually quite modest. To achieve significant data reductions (a factor of 50 or more), most of the picture information must be discarded. There are two ways to do this and still produce an acceptable picture.
72. Since most frames in a sequence contain much of the same information, the first technique is to transmit only the differences between successive frames plus, from time to time, a reference frame. The second technique is to discard what the eye cannot see or is not particularly responsive to. For instance, considerable picture detail is transmitted in

the middle of the colour band – yellow/green – where the human eye is most sensitive, while much less is transmitted at the extremes – red and violet – where the human eye is least sensitive. Further advantage is taken of the fact that the eye cannot track fine detail during scenes of rapid motion. There are limits, however, to how far these techniques can be taken; the more a signal is compressed, the less detail is presented to the receivers.

c) Source formats

73. The A/53 standard will accommodate widescreen 16:9 images with a maximum resolution of 1920×1080, which is more than six times the display resolution of the current NTSC transmission standard. In all, 18 different formats are supported.

d) Video/audio systems

74. The ATSC system uses MPEG-2 video stream syntax for video coding and the Dolby Digital AC-3 codec (Dolby Digital 5.1) for audio coding. Although ATSC television sets can display only one particular format, they are all designed to decode all HDTV and standard definition television (SDTV) streams, thus providing program service providers with maximum flexibility.

e) Receivers

75. ATSC receivers recover the bits representing the original video, audio and data from the modulated signals. The receivers perform the following functions:
- tune to the requested 6 MHz channel;
 - reject adjacent channels and other sources of interference;
 - demodulate the received signal and apply error correction to reproduce the transport bitstream;
 - identify the elements of the bitstream using a transport layer processor;
 - select each desired element and send each one to the appropriate processor;
 - decode and synchronize each element;
 - perform product-specific video, audio, and data processing;
 - present the programming to the appropriate video or audio transducer.
76. As can be seen from the functions described above, digital ATSC receivers are much more complex than the relatively simple analog NTSC receivers.

f) The analog to digital transition

77. In the United States, analog transmission of television will cease as of 17 February 2009, making all television sets without either a built-in digital tuner or an external digital broadcast receiver unable to receive television broadcasts.

78. In Europe, the European Union (EU) has recommended that all member states switch to DTV technology by 2012. The Netherlands has the earliest deadline, with a firm date of 2006 for shut off. Finland is scheduled to shut off in 2007. Sweden will follow in 2008, Denmark and Norway in 2009, and Austria and Germany in 2010. In the UK, the switchover from a mixture of analog and digital services to a completely digital service will start in 2008, and will be completed by 2012. In contrast to other countries, Canada has adopted a voluntary, market-driven transition model without mandated deadlines.
79. Canadian over-the-air (OTA) broadcasters have only just recently launched limited digital transmission services in Toronto, Montréal and Vancouver. For those living along the border, certain US OTA digital signals are available; however, consumers need a special antenna and an HDTV-tuner-equipped television set to receive them.

C. Cable distribution

C.1. Analog cable

80. Cable television, or community antenna television (CATV), is a system to provide conventional television, pay and specialty services, radio programming, Internet and other services to consumers via radio frequency signals transmitted directly to the subscribers' televisions through fixed optical fibers and/or coaxial cables as opposed to via OTA transmissions used in traditional television broadcasting for which a television antenna is required. The first cable systems were designed to import signals from distant markets and to improve reception in fringe areas and in locations subject to multipath interference (ghosting).
81. A large cable network may consist of a master head-end, a number of regional head-ends, a number of local head-ends (hubs), and a large number of district or neighbourhood nodes. The interchange of content and data between master and regional head-ends may be over satellite or optical fibers. Fibers will typically be used between regional head-ends and local head-ends, as well as between local head-ends and district or neighbourhood nodes. However, the final link, between the district or neighbourhood nodes and the customer premises, is typically over coaxial cable. The section linking the customer premises with the network is called the subscriber drop.
82. As in the case of radio broadcasting, the use of different frequencies allows many channels to be distributed through the same cable. In analog cable, a bandwidth of 6 MHz is needed for each channel. The tuner of the television, VCR or radio selects one channel from this mixed signal.

C.2. Digital cable

a) Standards

83. The cable industry began the transition to digital cable in the early 1990s with the development and roll-out of the 64- and 256-QAM (quadrature amplitude) formats. The primary bodies for the standardization of cable equipment in North America are the Society of Cable Telecommunications Engineers (SCTE) and the American National Standards Institute (ANSI).
84. Cable Television Laboratories, Inc., a research and development consortium, is dedicated to helping its cable operator members integrate new cable telecommunications technologies into their business objectives. Their current projects include the following:
 - DOCSIS (Data over cable service interface specification) – to define interface requirements for cable modems involved in high-speed data distribution over cable television system networks.
 - CableHome – to develop the interface specifications necessary to extend high quality cable-based services to network devices within the home.
 - PacketCable – to develop interoperable interface specifications for delivering advanced, real-time multimedia services over two-way cable plant.
 - OpenCable – to deploy interactive services over cable.
 - Go2Broadband – to assist affiliated computer makers, retail partners, and content providers in selling cable services.
 - VOD Metadata to investigate the distribution of content assets (e.g., movies) from multiple content providers sent over diverse networks to cable operators.
 - Digital Advertising – to develop ad insertion systems that will enable cable head-ends and broadcast affiliates to insert locally generated commercials and short programs into remotely distributed regional programs before they are delivered to home viewers.

b) System overview

85. The system bandwidths of a typical cable plant are in the range of 550 MHz – 870 MHz, although a number of smaller systems have not yet upgraded to 550 MHz and a few aggressive systems have built beyond 870 MHz. In terms of system capacity, an 870 MHz system could carry about 120 analog signals. Typically, however, systems

carry about 70 analog signals and about 300 compressed digital SD and HD signals. Frequency use typically is 8 MHz – 40 MHz for uploading services and 70 MHz – 870 MHz for downloading services. Five types of services are associated with the typical system:

- analog television and audio services (legacy);
- digital television and audio services (including pay and specialty services);
- video-on-demand (VOD) and other interactive services;
- cable modem (broadband) Internet services; and
- Voice over Internet Protocol (VoIP) services.

c) Standard definition (SD)

86. When using 64-QAM, the bit rate can reach 27 Mbps per 6 MHz channel. However, if 256-QAM is used instead, the bit rate can reach 38.8 Mbps. Using the latter and MPEG-2 transport streams, each 6 MHz cable channel typically carries 7 to 12 digital SDTV channels, each at a bit rate of 3–5 Mbps. Note that SD signals are the digital equivalents of NTSC analog signals.

d) High definition (HD)

87. In the case of HDTV, only two HD channels can be transmitted in each 6 MHz cable channel when 256-QAM and a MPEG-2 transport stream are used. With the development of the new MPEG-4 advanced video compression (AVC) standard and better statistical multiplexing, each 6 MHz channel may be able to carry as many as four HDTV services. However, cable set-top boxes currently deployed in the market support only MPEG-2 decoding. Cable companies will therefore have to implement some type of replacement strategy when they deploy MPEG-4 technologies. The Communications Research Centre (CRC) addressed this issue in its submission to this proceeding and the question is discussed in the Distribution section of this report.
88. Cable companies still provide a full suite of analog services to their customers. If all of these services were digitized, effective cable plant capacity would increase significantly. Nevertheless, with the transition to HD, effective cable plant capacity will largely revert to today's values.

D. Satellite distribution

a) Technology

89. Satellite television is television delivered by way of communications satellites, as compared to conventional terrestrial, OTA television and cable television. In many areas of the world, satellite television services supplement older terrestrial signals, providing a wider range of channels and services, including subscription-only services.

90. Satellites used for television signals are mainly in geostationary orbits 35,786 km (22,240 miles) above the earth's equator, where they appear to be fixed relative to an observer on the ground.
91. Satellite television, like other communications relayed by satellite, starts with a transmitting antenna located at an uplink facility. Uplink satellite dishes are very large – up to 9 to 12 metres (30 to 40 feet) in diameter – for the larger the diameter, the more accurate aiming and increased signal strength at the satellite receiver. The uplink dish is pointed toward a specific satellite and the uplinked signals are transmitted within a specific frequency range so as to be received by one of the transponders⁷ tuned to that frequency range aboard that satellite. The transponder retransmits the signals back to Earth at a different frequency band (to avoid interference with the uplink signal).⁸ The leg of the signal path from the satellite to the receiving Earth station is called the downlink.
92. Satellite capacity is often measured by the number of transponders operating on specified frequencies. For example, Anik F1 carries 36 C-band and 48 K_u-band transponders. Anik F2 carries 24 C-band, 40 K_u-band and 50 K_a-band transponders. The total number of transponders on board a satellite, and consequently the satellite's capacity, are limited by the satellite's power supply.
93. The downlinked satellite signal, weakened from travelling the great distance, is collected by a parabolic receiving dish that reflects the weak signal to the dish's focal point. Mounted on brackets at the dish's focal point is a device called a feedhorn. The feedhorn is the front-end of a waveguide that gathers the signals at or near the focal point and conducts them to a low-noise block downconverter (LNB). The LNB converts the signals from electromagnetic or radio waves to electrical signals, and shifts the signals from the downlinked C-band and/or K_u-band to the L-band range. Direct broadcast satellite dishes use an LNBF, which integrates the feedhorn with the LNB. The L-band signal, now amplified, travels to a satellite receiver box, typically through coaxial cable. The satellite receiver converts the signals to the desired form (outputs for television, audio, data, etc.). Often, the receiver has the ability to unscramble or decrypt, and is then called an integrated receiver-decoder (IRD).

b) Fixed satellite service (FSS) and Broadcasting satellite service (BSS)

94. Fixed satellite service (FSS) is the International Telecommunication Union (ITU) classification for geostationary communications satellites used chiefly for broadcast feeds for conventional television, radio, telephony, data communications, DTH and cable.

⁷ Typical transponders have bandwidths from 27 MHz to 54 MHz.

⁸ Typically in the C-band and/or K_u-band

95. Broadcasting satellite service (BSS) refers to satellite television broadcasts intended for home reception and are also referred to as DTH signals. BSS covers both analog and digital television and radio reception, and is often extended to other services provided by modern digital television systems, including VOD and interactive features.
96. FSS satellites operate their downlinks in either the C-band from 3.7 GHz to 4.2 GHz, the K_u-band from 11.7 GHz to 12.2 GHz or the K_a-band from 18.3 GHz to 18.7 GHz and 19.7 GHz to 20.2 GHz. BSS satellites operate in the BSS K_u-band from 12.2 GHz to 12.7 GHz. FSS satellites operate at a lower power than BSS satellites and require a larger dish than a BSS system, usually 1 to 3 metres (3 to 8 feet) for the K_u-band, and at least 4 metres (12 feet) for the C-band (compared to 18 to 24 inches for BSS dishes).⁹ Also, unlike BSS satellites, which use circular polarization on their transponders, FSS satellite transponders use linear polarization.
97. In Canada, Star Choice satellite TV service relies on FSS satellite technology in the K_u-band. Star Choice uses the satellites Anik F1 and Anik F2. Anik F1 carries the bulk of the English-language programming. Anik F2 carries mostly French and ethnic programming, as well as their HD channels.
98. Bell ExpressVu uses BSS technology for the transmission of its DTH signals to Canadian customers. The company is currently using four satellites, Nimiql 1 to 4, to deliver its services.

c) Standard definition television (SDTV)

99. For SDTV services, DTH systems use a quaternary phase shift keying (QPSK) modulation scheme with an MPEG-2 transport stream. The video source coding uses the MPEG-2 standard, while the audio coding uses either the MPEG-2 or the ATSC A/53 standard.

d) High definition television (HDTV)

100. With a growing market demand for more HDTV channels, digital video broadcast-satellite 2 (DVB-S2), an improved type of modulation and coding standard, was put in place in 2005. In addition, for HDTV services, the DTH systems use MPEG-4 AVC technology as well as, improved statistical multiplexing and audio compression technologies to further reduce the bandwidth required for HD and SD services. In fact, they hope to double their effective capacity. The broadcasting of MPEG-2 signals is expected to continue for some time, however, because of the cost to replace millions of MPEG-2 receivers.

⁹ Star Choice is an exception. It operates with FSS satellites that compare in size to those used with BSS systems.

101. On 11 July 2006, the Department launched a satellite licensing program, indicating that it expects to award up to 29 licences to provide the capacity needed to fully implement HDTV and other new services. Some satellites resulting from this initiative may be providing services as early as October 2009. The Department said it has already received indications of interest from Bell ExpressVu, Telesat Canada, Ciel Satellite Communications Inc. and Eutelsat SA.

E. Wireless cable – Multi-channel multipoint distribution system (MMDS)

102. The multi-channel multipoint distribution system (MMDS), also known as wireless cable, is a wireless telecommunications technology used as an alternative method for delivering cable television programming and Internet services. MMDS is used in Canada and other countries, including the United States, Mexico, Ireland, Brazil, Australia and Pakistan, most often in sparsely populated rural areas where laying cables is not economically viable; it is also used in certain urban areas.
103. In Canada, MMDS services currently use the microwave frequency band (2.596 GHz – 2.686 GHz) to distribute video programming to fixed locations. Reception of MMDS-delivered television signals is done with a special rooftop microwave antenna and a set-top receiver box that is very similar in appearance to an analog cable television receiver box. MMDS offers 3 Mbps for downloaded services and 200 kbps for uploaded services.
104. In Canada, Look Communication Inc. offers digital television, pay and specialty services as well as wireless, bi-directional high speed Internet from its MMDS transmitters situated in Ontario and Quebec. The service radius for its bi-directional Internet service can be up to 25 kilometers from the transmitting towers. Sky Cable and Image Wireless Communications are the two large MMDS service providers. These distributors operate all-digital services, but have limited capacity and do not offer any HDTV or on-demand services. They have been experiencing some decline in overall subscribers and currently serve fewer than 40,000 subscribers in Canada.
105. MMDS requires a direct line of sight between the transmitter and each receiver, which can pose certain challenges. When dense tree coverage, buildings, or mountains interfere with transmission, fill-in transmitters are needed to overcome obstructions. Multipath distortion, which results from signal reflections off buildings or other structures, can also cause problems.
106. Another disadvantage of MMDS technology is the limited number of channels available compared to cable television or satellite undertakings. Only 90 MHz of spectrum is currently allocated to MMDS. This constraint reduces the effective number of channels that a single MMDS system can provide.

Spectrum Issues

107. In a policy statement made on 30 March 2006, the Department announced that it will harmonize the band plan to be compatible with the US plan and will consult on implementation matters. In view of this, the Department indicated that it will not consider renewing any broadcasting certificates for any MMDS licences beyond 2011 until the next round of consultations sets a date for implementing the mobile service and the new band plan.

F. Mobile TV

Overview

	DVB-H	DMB	ISDB-T	MediaFLO	TDtv
Standard	Open	Open	Open	Proprietary	Proprietary
Region	US, Europe, parts of Asia	Canada, Korea, expanding to other countries	Japan	US	Europe, parts of Asia
Air Interface	OFDM	OFDM	OFDM (sub-banded)	OFDM	TD-CDMA
Spectrum Band	1.7 GHz (L-band)	Korea 180 - 186, 204 - 210 MHz for DMB-T; 2,630 - 2,655 MHz for DMB-S; Canada 1.5 GHz (L-band)	470 - 862 MHz	700 MHz	1,900 MHz, 2,010 MHz
Service Availability	Mid-2005, open US spectrum nationwide	Currently available	Early 2006	2006/2007	Mid-2007
Handset Availability	Currently available from several original equipment manufacturers (OEMs)	Currently available from several OEMs	2006	2006/2007	Beginning of 2007

108. The services named in this chart are described in the sections that follow.
109. Mobile TV refers to a television service that is offered to subscribers via mobile devices provided by cellular phone carriers and/or conventional broadcasters using their own transmission facilities. The broadcasting and telecommunication industries are actively studying the roll-out of mobile TV services by looking at technical questions and content issues including the re-formatting and licensing of existing programs.
110. One of the key disadvantages of mobile TV is the limited capacity of the current 3G wireless networks to deliver video services. With the number of mobile TV subscribers increasing, the current system will soon reach capacity constraints. The current development of High Speed Downlink Packet Access (HSDPA) technology, however, should permit faster transmissions.
111. Screen size is another limitation to mobile TV. The ideal three-inch display screen presents a challenge for designers struggling to maintain the sleek, compact appeal of mobile phones.
112. Power consumption is yet another challenge. A mass-market roll-out will depend on the ability of mobile phones to provide TV pictures without significantly reducing battery life. To reduce power consumption, new digital television standards that are compatible with mobile phones have been developed. Nevertheless, the parties involved cannot all agree on a universal standard.
113. Several possibilities exist when it comes to standards: Digital Video Broadcasting-Handheld (DVB-H), DMB, Integrated Services Digital Broadcasting-Terrestrial (ISDB-T), MediaFLO and TDtv. Each one has its own strengths and drawbacks. These standards are discussed in the sections that follow.

F.1. Digital video broadcasting – handheld (DVB-H)

114. DVB-H is a worldwide standard for multimedia broadcasting to mobile, handheld receivers.

a) Background

115. The terrestrial version of the digital video broadcasting (DVB) system, DVB-T, was developed during the mid-1990s in Europe. Its primary intended use was for the stationary reception of digital television signals using roof-top antennas and portable reception. The cost of the receiver implementation strongly influenced the design of the system.

116. During mobile testing of DVB-T, the question was raised whether DVB-T would also be suitable for other multimedia applications in the mobile environment. In particular, mobile phone manufacturers were interested in high data-rate applications over DVB-T to provide mobile multimedia services. The motivation for this access technology was that television was the last missing link in the value chain of the mobile phone business. As it turned out, DVB-T's drawbacks for broadcasting to mobile phones were discovered early on, and the idea of DVB-H, a dedicated standard for handheld receivers based on DVB-T, was born.

b) System requirements

117. The commercial requirements of the DVB-H system were determined in 2002 as follows:

- DVB-H shall offer broadcast services for portable and mobile usage, including audio and video streaming with acceptable quality. Data rates of up to 10 Mbps per channel must be supported. Transmission will mostly employ channels in the regular UHF television band, although VHF and perhaps non-broadcast frequencies may also be used. Broad area coverage must be possible.
- The term “handheld terminal” includes multimedia mobile phones with colour displays as well as personal digital assistants (PDAs) and pocket PC types of equipment. These devices have a number of features in common (e.g., small dimensions, light weight and battery operation); all are preconditions for mobile usage but each sets severe restrictions on the transmission system.¹⁰
- Mobility is another requirement. Access to services must be possible not only at almost all indoor and outdoor locations but also while moving in a vehicle at high speeds. In addition, the hand off between adjacent DVB-H radio cells must happen imperceptibly when moving over larger distances.
- The system must be similar to the existing DVB-T system. The DVB-H and DVB-T network structures must be as compatible as possible in order to enable the re-use of the same transmission equipment.

c) System overview

118. DVB-H, as a specification, sets out the requirements for the transmission system as well as for a number of the critical subsystems. For example, one of these subsystems is a power-saving algorithm based on the time-multiplexed transmission of different services. The technique, called time splicing, results in a large saving of battery power. Individual program services are transmitted as data bursts in small time slots. The front end of the receiver switches on only for the time interval when the data burst of a selected service is being transmitted. Within this short period of burst time, a great deal of data is received

¹⁰ For example, the terminal devices lack an external power supply and, to obtain reasonable usage and standby capability, must be operated with a limited power budget.

and stored in a buffer. This buffer can either store the downloaded applications or play out live streams. The achievable power saving depends on the relation of the on/off time. As there are often ten or more bursted services in a single DVB-H stream, power saving for the front end can be up to 90%. Additionally, time splicing allows a soft hand off if the receiver moves from one network cell to another because the long power-save periods are used to search for channels in neighbouring radio cells offering the selected service.

119. In contrast to other DVB transmission systems that are based on the DVB transport stream adopted from the MPEG-2 standard, the DVB-H system is based in part on Internet Protocol (IP). Consequently, the DVB-H baseband interface is an IP interface that allows the DVB-H system to be combined with other IP-based networks. Nevertheless, an MPEG-2 transport stream is still used for the transmission itself; the IP data are embedded into it.
120. The data bursts described above are error-prone. This is compounded by the fact that the antennas built into the handheld devices have limited dimensions¹¹ and cannot be pointed at the transmitter if the terminal is in motion. Thus, for reliable transmission in poor signal reception conditions, an enhanced error-protection scheme called multi-protocol encapsulation – forward error correction (MPE-FEC) provides a second layer of channel coding on top of the channel coding included in the DVB-T specification. This additional coding reduces the signal to noise ratio requirements for the system.
121. The DVB-H standard also features an additional network mode: the 4k mode. The 4k mode offers additional flexibility in designing single frequency networks (SFNs), which can provide wide area coverage that is well suited for mobile reception. In addition, the standard provides an enhanced signalling channel for improving access to the various services.
122. The radio transmissions use Orthogonal Frequency Division Multiplexing (OFDM) multi-carrier modulation. Only one obligatory new transmission feature makes the DVB-H signal, distinguishable from a DVB-T signal – namely, an extended parameter signalling for the DVB-H elementary streams in the multiplex. However, the signalling is realized in a way that is downwards compatible with the DVB-T stream, which means that DVB-H data streams can be broadcast via DVB-T transmitter networks totally dedicated to the DVB-H services as well as via DVB-T networks carrying compatible television services in addition to DVB-H services. In terms of capacity, one 8 MHz channel (the European standard)¹² can deliver 30 to 50 video streaming services to small screen terminals, or ten times more than SDTV using MPEG-2.

¹¹ To be effective, the size of the antenna must be proportional to the wavelength of the transmitted signal. This is not practical for UHF signal reception on small mobile phones because the wavelengths run from about two feet at the low end of the UHF band to about one foot at the high end of the band.

¹² The North American standard is 6 MHz.

d) Network structure

123. A typical DVB-H network is composed of several SFN coverage areas, each using its own frequency allotment. The maximum size of one SFN coverage area depends on the chosen set of transmission parameters and local geographical properties, but it is typically in the order of tens of kilometres. Each SFN coverage area would have several GPS-synchronized transmitters supported by a number of on-channel repeaters to cover shadowed zones. Given that the required field strength in a DVB-H network is fairly high and that the total interfering power allowed from an allotment is limited by the coordination plan, the number of synchronized main transmitters should be higher and the transmitter powers and antenna heights lower than in a traditional DVB-T network. (For this reason, a DVB-H SFN network can be called dense SFN.) Obviously, the cost of such a network is higher than a conventional DVB-T network, but the number of services in one multiplex is ten times higher, albeit of much lower quality and size.

e) Developments in North America

124. After an initial trial run in Pittsburgh, Crown Castle, in association with Verizon Wireless (Verizon), will launch 10 video and at least 24 audio channels using DVB-H in select US cities in 2006. By 2007, Crown Castle and Verizon expect the service to be available in 30 markets, covering one half of the population. The DVB-H service will be broadcast over a 6 MHz channel in the L-band (1670 MHz – 1675 MHz) that reaches much of the United States. The audio service will cost \$7 to \$9 per month and complete audio and video access, \$15 to \$20 per month. As for receivers, Nokia, LG and Samsung have all announced support for the DVB-H standard. In October 2004, Texas Instruments introduced “Hollywood,” a single-chip tuner, receiver and processor for mobile TV that supports both the DVB-H and ISDB-T standards. It can deliver up to eight hours of TV time on one standard battery charge.
125. Verizon will not use its existing cellular network to distribute video programming because video not only taxes the capacity of cellular networks, but it also displaces more lucrative traffic while doing so.

F.2. Digital multimedia broadcasting (DMB)

126. DMB is a worldwide technology that delivers multimedia programming based on the Eureka-147 DAB standard. Korea has developed much of the technology and is rolling out a national terrestrial network as well as a supplementary satellite component.

a) Background

127. DMB's predecessor, DAB, originated in the late 1980s in Europe, where a number of countries organized a project called "Eureka-147" to develop the technology for digital radio broadcasting. The first terrestrial DAB service was launched by the BBC in England in September 1995. Since then, many other countries around the world – with the notable exception of the United States – have introduced DAB services. The standard has been implemented in the L-band.
128. The standard was eventually expanded to include other forms of multimedia broadcasting services, including video and data. The upgraded service was then named digital multimedia broadcasting (DMB).
129. In general, DMB and DVB-H are based on the same modulation and coding technique. The differences between them exist mainly in specific areas such as the carrier spacing and the carrier modulation scheme. Once past the first stage of the receive process, much of the rest of the receive system can use the same hardware, suitably adapted by specific software applications.

b) Types of DMB

130. There are two types of DMB: terrestrial DMB and satellite DMB. The two types use different technologies and network configurations, and different frequency bandwidths. Consequently, it will likely take a considerable amount of time and development before terminals that can receive both terrestrial DMB and satellite DMB services are available.

i. Terrestrial DMB

131. Terrestrial DMB service, which is based on OFDM, is provided to Seoul and its surrounding areas via VHF channels 8 and 12. In 2010, the country's analog television services will be shut down. As a result, there should be sufficient spectrum in the upper VHF band to allocate one TV channel to each of the five primary service areas¹³ (Chungchung, Chulla, Kangwon, Kyungsang, and Cheju). Within each of these service areas, on-channel repeaters will supplement the coverage provided by the main transmitter.
132. The 6 MHz VHF channel bandwidth in Korea is divided into three frequency blocks, called multiplexes, and each service provider has been awarded one of the multiplexes. A maximum data rate of approximately 1.5 Mbps to 1.7 Mbps per multiplex is possible but, because of the need to provide guard bands that are error correction codes, the effective data rate is somewhat lower at 1.2 Mbps. Using the most efficient compression technology, i.e., MPEG-4 (H.264), each multiplex can accommodate two television channels or one television channel and several audio and data channels with an image quality equivalent to analog video tape (VHS).

¹³ Five service areas are needed because Korea is too large to be served by a national SFN.

133. The standard is well suited to the technical requirements of mobile terminals if a data rate of 300 kbps or less is used per service. Because DMB uses smaller multiplexes, it offers more operator flexibility than DVB-H. Further, because of the lower bandwidth, DMB transmitters need much less power than DVB-H transmitter networks. DMB also has a simpler demodulation technique than DVB-H, called differential quadrature phase-shift keying (DQPSK), which enables a corresponding reduction in receiver complexity.

ii. Satellite DMB

134. The satellite DMB service uses the S-band (2.630 GHz – 2.655 GHz) for DMB transmissions¹⁴ and is supplemented by terrestrial gap fillers in places where it is difficult to receive satellite signals directly, e.g., under overpasses or in underground parking garages. These gap fillers also use the S-band. Mobile reception of the satellite service is possible.
135. The transmission standard (System B) for satellite DMB has been established as a national technology standard in Korea. It is based on code division multiple access (CDMA), which allows multiple users to share the same frequency band at the same time. As a result, however, satellite DMB receivers are not compatible with terrestrial DMB receivers. As noted above, the development of dual-use terminals is expected to take some time. But more importantly, the costs of these terminals are expected to be too high for them to be readily marketable.
136. The terrestrial gap fillers can retransmit about 60% of Korea's conventional television programs. Thus, Korea has not had to focus on developing dedicated television content for the DMB service. Rather, it has developed special material for the dedicated mobile channel and a number of music services for the audio channels. Korea has also developed a data component that provides information support, such as song titles, for the music services.

F.3. Integrated services digital broadcasting-terrestrial (ISDB-T)

137. ISDB-T is a new type of broadcasting system for multimedia services established in Japan. It integrates various kinds of digital content, such as HDTV, SDTV, audio, and data services, and operates in the 470 MHz to 862 MHz frequency band. With a bandwidth of 6 MHz, the peak data rate can reach approximately 23 Mbps.
138. In ISDB-T, each channel is divided into 13 segments. One to three segments are needed for audio and data broadcasting, while 6 to 12 segments are needed for TV broadcasting, depending on the quality of the television picture required. ISDB-T uses band segment transmission BST-OFDM with phase shift keying (PSK) and QAM modulation for transmission.

¹⁴ The uplink uses part of the K_u-band, 12 GHz – 13 GHz.

139. The ISDB-T mobile service has adopted the MPEG-2 transport stream system with audio and video compression. It allows HDTV to be received in vehicles moving at over 100 km/h.

F.4. MediaFLO

140. MediaFLO is a new technology to broadcast data to portable devices such as cell phones and PDAs. Broadcast data include audio and video streams, individual video and audio clips, as well as information such as stock market quotes, sports scores and weather reports. The “FLO” in MediaFLO stands for Forward Link Only, meaning that the data is transmitted one way only, from the tower to the portable device. The MediaFLO system transmits data on a frequency separate from those used by current cellular networks.
141. Devices incorporating MediaFLO technology were introduced by LG and Samsung in 2006 in Las Vegas. On 1 December 2005, Verizon and Qualcomm announced their partnership for the launch of the MediaFLO network. Verizon expects to deploy MediaFLO in half of its 1xEV-DO markets in the United States in the latter part of 2006.¹⁵
142. MediaFLO is based on OFDM outbound high-speed technology. It can deliver between 50 and 100 national and local content channels, including as many as 15 live streaming services and numerous clip-cast and audio programs across the country. According to Qualcomm, the content will be delivered in an easy-to-use and familiar format at quality levels that surpass current mobile multimedia offerings. Because the system is outbound only and uses the 700 MHz band¹⁶ (which has better propagation characteristics than either the 850 MHz or 1900 MHz bands), the MediaFLO system will require fewer transmitters to cover the United States than the standard wireless two-way systems with which it competes. Specifically, according to Qualcomm's estimates, MediaFLO will provide nationwide coverage with 30 to 50 times fewer transmitter sites, which represents a huge savings in the cost of building the system.
143. One potential concern with MediaFLO is the use of a proprietary standard, which could mean higher costs to bring the technology to the market. To develop an open standard, the major industry players must achieve a consensus. Once achieved, that consensus can drive down the costs of bringing the technology to market.

¹⁵ Evolution Data Only/Evolution Data Optimized (EV-DO) provides wireless broadband access (3G) Internet service directly to laptops.

¹⁶ Previously allocated to UHF TV channel 55

F.5. TDtv

144. TDtv is a new proprietary technology by IPWireless that will be used to broadcast mobile TV to handheld devices. In Europe and in certain parts of Asia, TDtv will operate in the 1900 MHz and 2010 MHz frequency bands. TDtv technology will also be able to operate in certain other frequency bands that IPWireless supports globally, including the 2.5 GHz band (S-band). TDtv is designed to use just the downlink channel and, as a result, provides better coverage than two-way uplink and downlink technology.
145. TDtv will enable the delivery of up to 50 channels of TV for a standard screen size phone or 15 higher quality Quarter Video Graphics Array (QVGA) resolution¹⁷ channels using 5 MHz of unpaired 3G spectrum. The IPWireless architecture is designed to integrate seamlessly with Wideband CDMA (W-CDMA) on both the network and the device. Low cost TDtv base stations can be easily co-sited on existing W-CDMA sites without additional regulatory issues. It therefore allows universal mobile telecommunications systems (UMTS) operators to fully use their existing spectrum and base stations to offer subscribers attractive mobile TV and multimedia packages without affecting their voice and data 3G services.
146. When this new standard will be incorporated into chips and services, however, remains to be seen because the Third Generation Partnership Project (3GPP) Release 6 standard includes numerous new features, among them High Speed Uplink Packet Access (HSUPA). Any upgrade to accommodate HSUPA could take years. By then, competitors such as MediaFLO and DVB-H may be well established in the marketplace.

G. Broadband wireline – Internet protocol television (IPTV)

147. Internet Protocol Television (IPTV) is television content that, instead of being delivered through traditional formats, is received by the viewer through the technologies used for computer networks. This is to say that the digital television content is formatted using IP and is typically supplied by a broadband operator, such as a telephone company, using digital subscriber line, version x (xDSL) technology over a network infrastructure. Each home receives this content through a broadband connection. Fee-based IPTV is often provided to residential users in conjunction with VOD and may be bundled with Internet services such as Web access and VoIP. The commercial bundling of IPTV, VoIP and Internet access is referred to as a Triple Play. Adding a mobile voice service is a Quadruple Play.
148. IPTV technology is also often used internally by conventional broadcasters to route and store their own programming material.

¹⁷ 320 x 240 pixels

a) Fee-based IPTV

149. Video content is typically an MPEG-2 transport stream delivered via IP multicast, a method in which information can be sent to multiple computers at the same time.
150. With some Internet service providers (ISPs) providing no more than a maximum of 16 Mbps download speed to customers and 30 Mbps being considered the desirable speed to support IPTV services, the typical system architecture will have to be upgraded to simultaneously handle the expected IPTV video services, which now include HDTV programming as well as the peak data traffic. Higher xDSL technologies such as asymmetric DSL2+ (ADSL2+) and very high bit-rate DSL (VDSL) could support downstream data rates in excess of 24 Mbps into subscribers' homes. However, it is estimated that data rates in excess of 30 Mbps will be needed to support today's projected IPTV services. In addition, it will be necessary to increase the distances served by the various DSL technologies. A standard currently in the works, known as VDSL2, should go some way to realizing this latter goal.
151. A complementary approach is to reduce the data rates necessary to support full HD video quality by upgrading the current MPEG-2 standard to the newly released MPEG-4, H.264 standard. Even so, the projected data rates will still be significant. Network designs must be able to accommodate multiple-person households watching two or three HD programs and accessing several broadband Internet services all at the same time.
152. Fee-based IPTV should not be confused with the delivery of TV content over the public Internet, which is widely called TV over Internet, Internet Television or free IPTV. While both are delivered via IP, the termination points into the home differ. Fee-based IPTV, as it is today, terminates in a set-top box with the requisite access controls before landing on screen, while Internet Television (non fee-based IPTV) requires only an Internet connection and goes directly to a display screen.
153. As of January 2006, over 1,200 free channels were available. This sector is growing rapidly as more and more major television broadcasters worldwide transmit their signals over the Internet. Various web portals offer access to these free IPTV signals. As mentioned above, free IPTV requires only an Internet connection and an Internet-enabled device such as a personal computer (and display), iPod or even a 3G cell phone. Some cite the ad-sponsored availability of TV series such as "Lost" and "Desperate Housewives" as indicators that IPTV will become more prevalent in the future.

b) Interactivity

154. An IP-based platform also allows significant opportunities to make TV viewing interactive and personalized. For example, assuming the necessary software is in place, viewers would be able to look up a player's stats while watching a game, or control the camera angle for a big play. They also may be able to access photos or music from their

PC on their television, or even use a wireless phone to schedule a recording of their favourite program, or adjust parental controls so their child can watch a documentary for a school report.

c) Advantages

155. The IP-based platform offers significant advantages, including the ability to integrate television with other IP-based services such as high speed Internet access and VoIP.
156. In spite of the limitations of xDSL technology, a switched IP network allows for the delivery of virtually any content. This is because the content remains in the network, and only the content the customer selects is sent into the customer's home. The customer's choice is not limited by the size of the "pipe" into the home.
157. IPTV uses a more efficient compression standard than free to air digital television, resulting in smaller file sizes or higher quality TV.

d) The future

158. In the coming years, IPTV is expected to grow at a brisk pace as broadband is now available to more than 100 million households worldwide. Many of the world's major telecommunications providers are exploring IPTV as a new revenue opportunity and as a defensive measure against encroachment from the cable television industry. Because it uses the Internet and sends less information than standard analog or digital television, IPTV promises lower costs for operators.

H. Video-on-demand (VOD)

159. VOD permits a customer access, via a digital cable set-top box, to browse large libraries of audio-visual content including feature length films, television programs and a variety of sporting events. The content resides on servers at the cable distribution undertaking and is delivered to individual viewers, based on selections they make from the interactive program guide menu. Viewers determine when the programming starts and they can pause, fast forward or rewind the program. Programming can be accessed on a pay-per-view or subscription basis, or can be available for free to digital subscribers.
160. Technically, when the viewer selects the movie, a point-to-point unicast connection is set up between the customer's decoder (set-top box or PC) and the delivering streaming server. The signalling for the various functions (pause, rewind, etc.) is handled by the Real Time Streaming Protocol (RTSP).

I. Evolution of technologies – Numbers

I.1. Radio, television and distribution in Canada

a) Analog and digital television transmitters operating in Canada from 2000 to 2006

The information in the following tables was obtained from the Department of Industry.

Analog TV Transmitters Private

	Jan. 1, 2000	Jan. 1, 2001	Jan. 1, 2002	Jan. 1, 2003	Jan. 1, 2004	Jan. 1, 2005	Jan. 1, 2006	June 1, 2006
NTSC Reg	305	308	312	316	317	324	336	338
NTSC LP	1101	1116	1132	1140	1142	1167	1179	1183
Total	1406	1424	1444	1456	1459	1491	1515	1521

Analog TV Transmitters CBC

	Jan. 1, 2000	Jan. 1, 2001	Jan. 1, 2002	Jan. 1, 2003	Jan. 1, 2004	Jan. 1, 2005	Jan. 1, 2006	June 1, 2006
NTSC Reg	370	375	378	379	380	381	387	393
NTSC LP	251	251	252	256	256	257	262	264
Total	621	626	630	635	636	638	649	657

Digital TV Transmitters- Private

	Jan. 1, 2000	Jan. 1, 2001	Jan. 1, 2002	Jan. 1, 2003	Jan. 1, 2004	Jan. 1, 2005	Jan. 1, 2006	June 1, 2006
DTV Reg	0	0	0	0	1	3	5	5
DTV LP	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	3	5	5

Digital TV Transmitters CBC

	Jan. 1, 2000	Jan. 1, 2001	Jan. 1, 2002	Jan. 1, 2003	Jan. 1, 2004	Jan. 1, 2005	Jan. 1, 2006	June 1, 2006
DTV Reg	0	0	0	0	0	0	2*	4*
DTV LP	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	2*	4*

* These numbers do not include the temporary transmitters of CBFT-DT and CBMT-DT Montréal that have been on-air since January 2005.

Analog TV Transmitters – Private, by language for regular class stations

	2000	2001	2002	2003	2004	2005	2006	Actual
CBC English Affiliates	32	32	33	33	33	33	33	33
CBC French Affiliates	10	10	10	10	10	10	11	11
English Private	211	214	215	219	220	225	233	236
French Private	52	52	54	54	54	56	58	58

Analog TV Transmitters – CBC, by language for regular class stations

	2000	2001	2002	2003	2004	2005	2006	Actual
CBC English	237	240	241	242	243	243	247	251
CBC French	133	135	137	137	137	138	140	142

TV Transmitters – Private, by language for low-power stations

	2000	2001	2002	2003	2004	2005	2006	Actual
CBC English Affiliates	106	107	108	108	108	108	109	110
CBC French Affiliates	9	10	10	10	10	10	10	10
English Private	635	643	652	652	652	654	654	657
French Private	26	26	27	28	28	30	31	31
Cancom	323	328	333	337	338	355	365	365
Other	2	2	2	5	6	10	10	10

TV Transmitters – CBC, by language for low-power stations

	2000	2001	2002	2003	2004	2005	2006	Actual
CBC English	211	211	212	216	216	217	220	222
CBC French	40	40	40	40	40	40	42	42

b) Analog and digital radio transmitters operating in Canada from 2000 to 2006

The information in the following tables was obtained from the Department of Industry.

Operational FM Stations (Analog)

	Number of on-air FM stations for each year (based on on-air date)						
	2000	2001	2002	2003	2004	2005	2006
Non-CBC Stations							
Number of low-power and very low-power stations	485	521	572	638	698	763	777
Number of regular power stations	418	466	515	563	610	668	718
CBC Stations							
Number of low-power and very low-power stations	23	23	23	23	23	23	23
Number of regular power stations	431	451	466	482	503	511	516
Total:	1357	1461	1576	1706	1834	1965	2034

NETWORK (non-CBC stations)							
Independent English	727	809	882	975	1043	1138	1168
Independent French	171	180	196	208	227	241	266
Independent other	3	3	3	10	15	21	23
Misc.	2	5	6	8	23	31	38
NETWORK (CBC stations)							
CBC English	318	327	337	341	350	357	359
CBC French	134	145	150	162	174	175	178
Other	2	2	2	2	2	2	2
Total:	1357	1471	1576	1706	1834	1965	2034

Operational AM Stations (Analog)

	Number of on-air AM stations for each year (based on on-air date)							Total AM stations currently on-air
	2000	2001	2002	2003	2004	2005	2006	
Non-CBC Stations								
Number of low-power and very low-power stations	23	23	23	23	24	25	25	26
Number of regular power stations	176	177	177	177	178	180	181	205
CBC Stations								
Number of low-power and very low-power stations	137	137	137	137	137	137	137	140
Number of regular power stations	29	29	29	29	29	29	30	30
Total:	365	366	366	366	368	371	373	401
NETWORK (non-CBC stations)								
Independent English	175	176	176	176	178	180	181	204
Independent French	15	15	15	15	15	15	15	15
Other	9	9	9	9	9	10	10	12
NETWORK (CBC stations)								
CBC English	133	133	133	133	133	133	134	137
CBC French	33	33	33	33	33	33	33	33
Other	0	0	0	0	0	0	0	0
Total:	365	366	366	366	368	371	373	401

The information in the following table was obtained from the Broadcasting Policy Monitoring Report. Reports 2000 to 2006

Digital radio stations approved* in Canada

	Digital radio station approved* in Canada						
	2000	July 2001	Aug. 2002	Aug. 2003	April 2004	Feb. 2005	May 2006
Non-CBC Station							
English	n/a	n/a	n/a	n/a	42	42	42
French	n/a	n/a	n/a	n/a	9	9	9
Ethnic	n/a	n/a	n/a	n/a	7	7	7
Total	41	42	42	42	58	58	58
CBC Station							
Radio One	n/a	n/a	n/a	n/a	5	5	5
Radio Two	n/a	n/a	n/a	n/a	5	5	5
Première Chaîne	n/a	n/a	n/a	n/a	4	4	4
Espace Musique	n/a	n/a	n/a	n/a	4	4	4
Total	12	14	14	14	18	18	18
Grand Total	53	56	56	56	76	76	76

*Note: These figures represent the numbers of DR stations approved but not necessarily on air.

c) Cable subscribers / services / and satellite subscriber totals in Canada from 2000 to 2005

The information in the following table was obtained from the Broadcasting Policy Monitoring Report 2006 and 2005

Satellite Subscribers (Basic)

2000	2001	2002	2003	2004	2005
880,092	1,519,620	1,959,677	2,151,837	2,277,283	2,454,775

I.2. Radio and television broadcasting stations in the US

The information in the following tables was obtained from the Federal Communications Commission.

	Sept. 2000	Sept. 2001	Sept. 2002	Sept. 2003	Sept. 2004	Sept. 2005	March 2006
AM stations	4,685	4,727	4,804	4,802	4,770	4,758	4,759
FM commercial	5,892	6,051	6,161	6,207	6,217	6,215	6,243
FM educational	2,140	2,234	2,331	2,441	2,512	2,626	2,746
Total	12,717	13,012	13,296	13,450	13,499	13,599	13,748
FM translators and boosters	3,243	3,600	3,790	3,830	3,868	3,920	4,049
Low-power FM	<i>na</i>	<i>na</i>	<i>na</i>	<i>na</i>	<i>na</i>	598	712
UHF commercial TV	721	737	752	762	777	781	782
VHF commercial TV	567	572	581	587	589	589	589
UHF educational TV	250	252	254	254	255	253	254
VHF educational TV	125	125	127	127	127	126	127
Total	1,663	1,686	1,714	1,730	1,748	1,749	1,752
Class A* UHF stations	13	336	463	499	492	485	481
Class A* VHF stations	0	88	105	110	110	108	108
Total	13	424	568	609	602	593	589
UHF translators	2,675	2,658	2,646	2,655	2,629	2,678	2,729
VHF translators	2,113	2,104	2,093	2,084	1,905	1,825	1,820
Total	8,031	8,362	8,529	8,569	8,402	8,423	8,598
UHF low-power TV	1,756	1,674	1,640	1,588	1,557	1,621	1,652
VHF low-power TV	610	538	523	523	496	496	505
Total	2,366	2,212	2,127	2,111	8,402	2,117	2,157
Total Broadcasting Stations	24,790	25,696	26,234	26,469	26,304	27,079	27,556

* As of 28 July 2006, there are 152 licensed AM and 695 FM IBOC stations.

DTV Operational	2000	2001	2002	2003	2004	2005	July28/06*
DTV	48	60	152	256	527	803	909
DTV Class A*	0	0	0	0	0	0	3
DTV low-power	0	0	0	0	0	0	2
Total	48	60	152	256	527	803	914

*Another 545 stations are authorised to be on the air with special or experimental DTV authorization, plus another 125 with program test authority. There are a total of 1,584 DTV licensed stations.

Appendix 2

Order in Council by the Governor in Council (Appendix to Broadcasting Public Notice CRTC 2006-72)

P.C. 2006-519
June 8, 2006

Whereas the evolution of audio-visual technologies is profoundly changing how Canadians communicate, express themselves and interact with various media bringing with it important economic and social implications and leading to a new communications and media environment;

Whereas the Canadian broadcasting system, primarily through its broadcast of English and French language programming services and programs, must meet the diverse needs of Canadian men, women and children, of all cultures;

Whereas the Government is of the view that the Canadian broadcasting system, using various audio-visual technologies, must remain relevant in a global digital environment and that Canada should continue to play a leading role in the development and usage of world class communications technologies;

Whereas the Government seeks to foster Canadian cultural choices by ensuring that Canadian content is available and accessible to Canadians, reflecting the rich diversity of this country;

Whereas Canadians seek a broad access to local, regional, national and international information and programming;

Whereas the Government favours a smart regulatory approach that ensures effective and efficient regulation focussed on results for Canadians;

Whereas the Canadian Radio-television and Telecommunications Commission (hereinafter referred to as "the Commission") is responsible for regulating and supervising all aspects of the Canadian broadcasting system with a view to implementing the broadcasting policy for Canada;

Whereas paragraph 3(1)(b) of the *Broadcasting Act* (hereinafter referred to as "the Act") provides that the Canadian broadcasting system comprises public, private and community elements;

Whereas paragraph 3(1)(c) of the Act provides that English and French language broadcasting, while sharing common aspects, operate under different conditions and may have different requirements;

Whereas subparagraph 3(1)(d)(iv) of the Act provides that the Canadian broadcasting system should be readily adaptable to scientific and technological change;

Whereas paragraph 3(1)(e) of the Act provides that each element of the Canadian broadcasting system shall contribute in an appropriate manner to the creation and presentation of Canadian programming;

Whereas subparagraph 3(1)(f)(ii) of the Act provides that distribution undertakings should provide efficient delivery of programming at affordable rates, using the most effective technologies available at reasonable cost;

Whereas paragraph 5(2)(c) of the Act provides that the Canadian broadcasting system should be regulated and supervised in a flexible manner that is readily adaptable to scientific and technological change;

Whereas paragraph 5(2)(f) of the Act provides that the Canadian broadcasting system should be regulated and supervised in a flexible manner that does not inhibit the development of information technologies and their application or the delivery of resultant services to Canadians;

Whereas the Commission has already undertaken a review of the impact of technological changes on its regulatory policies with respect to commercial radio undertakings;

Whereas the Telecommunications Policy Review Panel, while not mandated to examine the broadcasting system, reported on the impact of evolving technologies on the telecommunications and broadcasting distribution sectors;

Whereas the Governor in Council is seeking a factual record on the future environment facing the whole broadcasting system that will inform the Government's own policy determinations with respect to the future of broadcasting in Canada;

Whereas subsection 15(1) of the Act provides that the Commission shall, on the request of the Governor in Council, hold hearings or make reports on any matter within the jurisdiction of the Commission under the Act;

And whereas, in accordance with subsection 15(2) of the Act, the Minister of Canadian Heritage has consulted with the Commission with regard to this request;

Therefore, Her Excellency the Governor General in Council, on the recommendation of the Minister of Canadian Heritage, pursuant to subsection 15(1) of the *Broadcasting Act*, hereby requests the Canadian Radio-television and Telecommunications Commission to hold hearings and provide a factual report at the earliest time practicable, and in any event not later than December 14, 2006, on the following matters:

a) the current state of audio-visual technologies and their predicted evolution over the coming years;

b) with respect to the usage of audio-visual technologies by Canadians,

- (i) changes in this usage since January 1, 2000,
- (ii) changes in demand for various kinds of programming and programming services since January 1, 2000,
- (iii) how Canadians of different generations use various technologies and the impact that these different uses will have on the broadcasting system,
- (iv) a comparison of the adoption rate for technologies between Canada and other countries,
- (v) the demand for various kinds of programming and programming services by the Canadian population, taking into account its full diversity,
- (vi) how future generations will consume or access content, programming, and programming services, and
- (vii) the impact this evolution of technologies has for content and programming choices available to Canadians, including local, regional, national and international content; and

c) with respect to the impact on the broadcasting system,

- (i) the adoption of technologies by broadcasting undertakings since January 1, 2000,
- (ii) the adoption of technologies by broadcasting undertakings since January 1, 2000,
- iii) the kind of content delivered through the regulated and the non-regulated aspects of the system, and how it is delivered,
- (iv) the different methods for providing local, regional and national programming on a going forward basis,
- (v) the predicted economic impact these technologies will have on broadcasting undertakings, and
- (vi) the adoption of technologies by the independent production sector and their impact on this sector.

Appendix 3

List of parties that responded to the call for comments – Broadcasting Public Notice CRTC 2006-72, 12 June 2006

Aboriginal Peoples Television Network (APTN)
Alliance of Canadian Cinema, Television and Radio Artists (ACTRA)
Alliance des radios communautaires du Canada (ARC du Canada)
Association of Quebec Film and Television Producers (APTFQ)
Association quebecoise de l'industrie du disque, du spectacle et de la video (ADISQ)
Bell Broadcast and New Media Fund (BBNM)
Bell Canada
Bell, MTS Allstream, SaskTel and TELUS (Bell et al.)
Betteridge, Jesse
CBC/Radio Canada
Canadian Association of Broadcasters (CAB)
Canadian Cable Systems Alliance Inc. (CCSA)
Canadian Coalition of Audio-Visual Unions (CCAU)
Canadian Conference of the Arts (CCA)
Canadian Film and Television Producers Association (CFTPA)
Canadian Independent Record Production Association (CIRPA)
Canadian Public Affairs Channel (CPAC) (2)
Canadian Recording Industry Association (CRIA)
CanWest MediaWorks Inc./CHUM
Catholic Civil Rights League
Cogeco Inc.
Commissioner of Official Languages
Communications, Energy and Paperworkers Union of Canada (CEP)
Communications Research Centre (CRC)
Corus Entertainment Inc.
CTV Inc.
Digital Media Association of Alberta
Film Ontario
FRIENDS of Canadian Broadcasting
High Fidelity HDTV Inc.
Information Technology Association of Canada (ITAC)
Knowledge Network
Manitoba Interactive Media Association (MIDMA)
MTS Allstream Inc.
National Film Board of Canada (NFB)
New Media BC
New Media Business Alliance
Ontario Media Development Corporation (OMDC)
Osmond, Keith
Pelmorex Communications Inc.
Quebecor Média Inc.

Rogers Cable Communications Inc.

Saskatchewan Communications Network Corp. (SCN)

Saskatchewan Interactive Media Association (SaskInteractive)

Saskatchewan Telecommunications (SaskTel)

Shaw Communications Inc.

Society of Composers, Authors and Music Publishers of Canada (SOCAN)

Téléfilm Canada

Telesat Canada

TELUS

Union des Artistes et Société des auteurs de radio, télévision et cinéma (UDA-SARTEC)