



Canadian Media Guild

La Guilde canadienne des médias

CWA/SCA CANADA

December 14, 2009

Mr. Robert Morin
Secretary General
CRTC
Gatineau, Quebec

Submitted electronically

Dear Mr. Morin:

Re: Reply on CRTC 2009-614

1. We are writing to flesh out our proposals for the recommendations we urge you to make to the government under the Order in Council that sparked this proceeding.
2. Canadian consumers are Canadian citizens, who are served by the country's Broadcasting Act. They should receive a diverse range of accessible and high-quality local, regional, national and international programming.
3. In a country as geographically large and sparsely populated as Canada, the market will not take care of citizens' full communications needs. We need strong public and community elements in our broadcast system to ensure a diversity of programming and viewpoints is available. Our national public broadcaster needs to be adequately funded to ensure that it can provide needed local television programming in both official languages across the country.
4. A significant proportion of Canadian citizens is interested in a basic television service focused on local and Canadian channels, including their public broadcasters. This service is most effectively provided over the air and can be efficiently provided in a digital world using digital multiplexing.
5. We are submitting results of a poll we commissioned last summer in Kamloops, BC, and put on the public record for CRTC 2009-411. The consumer and citizen views of the people of Kamloops concerning the transition to digital TV and the kinds of service that interests them is also germane to this proceeding.
6. The poll found that 84% of residents believe it is unfair that they will not have access to digital OTA signals after the transition while their counterparts in Canada's major

cities will. It also found that 33% of people in Kamloops would choose to watch 6 free channels over the air, which would be available under digital multiplexing, instead of subscribing to cable or satellite. At the moment, only 6% watch TV over the air and only 3 channels are available. From a consumer perspective, it is clear there is interest in greater OTA choice in Kamloops.

7. We are also attaching the reply we submitted under 2009-411, which outlines how digital multiplexing would work and the costs involved in it. As indicated during this public hearing, we contend that it would be cheaper for the government to help pay for digital multiplexing in smaller markets currently served by repeater transmitters than to pay for the equipment needed by existing OTA households to participate in a “free” satellite service.
8. We urge you to make the following recommendations to the government:
 - 1) From the proceeds of the upcoming auction of spectrum freed up by the transition to digital television, finance the infrastructure needed to establish digital multiplexes in all communities currently receiving analogue service but where there is no originating station. The estimated total one-time cost of the infrastructure for all communities, based on cost studies, is \$140 million to \$227 million.
 - 2) Work with the Commission and the industry to develop a shared system for digital television in communities where there is currently no originating station.
 - 3) To ensure that the main public element of the broadcasting system, CBC/Radio-Canada, can provide needed local, regional and national programming in both official languages, distinct from the programming provided by private broadcasters, we urge the government increase per capita funding to \$40, as recommended by the Standing Committee on Canadian Heritage in 2008. This would amount to approximately \$200 million in additional funding per year and should be targeted to an expansion of local TV, radio and online programming in both official languages, beginning with communities where private-sector broadcasters no longer have a business case to provide service.
 - 4) Work with the Commission and the industry to make sure that Canadians are informed of the changes that result from the digital transition.

*** END OF DOCUMENT***

Sincerely,

Karen Wirsig
Communications co-ordinator



Canadian Media Guild

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December 14, 2009

Mr. Robert Morin
Secretary General
CRTC
Gatineau, Quebec

Submitted electronically

Mr. Morin:

Re: Reply on CRTC 2009-411

1. As requested by Commissioner Simpson during our oral presentation on November 20, 2009, we are submitting our research on The Digital TV transition in Canada, which outlines how shared digital multiplexing could work, and how much it would cost in communities that are slated to be left behind by the broadcasters during the transition.
2. We also want to emphasize that the current “hybrid” plan for digital transmitters in 29 communities and some form of BDU coverage for the rest of Canada - home to some 11 million Canadians – is unfair.
3. Among that group to be left behind in the new digital reality are those who live in the estimated 590,000 households that currently get their TV signals over the air, as per the report from Price Waterhouse Coopers that is on the record for this proceeding. Reliance on BDUs to serve these people is not a solution. There are significant one-time and/or ongoing costs – both to BDUs and consumers – associated with the so-called “free” and “skinny” BDU services that have been proposed. What’s more, no one can guarantee how long BDUs would continue to provide a free service to these subscribers. We understand in the case of the Bell Freesat proposal, for example, that the space devoted to the free service is on an unused band on a satellite that will come to the end of its life in the next decade or so.
4. We contend that the real solution is the multiplexing of digital OTA signals. And not only is multiplexing a solution to the transition, it is also a way to breathe new life into local and independent TV in smaller communities, where there is currently limited choice for OTA viewing. We look at this as an opportunity to de-fragment TV

viewing by providing an appropriate and affordable service to the significant proportion of Canadians interested in a modest selection of local and Canadian TV. It's also an effective way to maintain the necessary infrastructure to broadcast localized emergency information.

5. In communities that currently don't have a local station, a local multiplex could provide a broadcast opportunity for a handful of national and/or regional public and private stations, as well as an opening for a new independent community station, which would fill a need in many communities for greater local diversity of voices. Under the hybrid model and BDU distribution plan, new entrants would have a much harder time getting established.
6. Approximately 28% of Canadians currently watch TV over the air or subscribe to a basic BDU package. That number is derived from the figures cited by Commissioner Simpson on November 20: 90% of Canadians subscribe to a BDU and 80% of those subscribe beyond the basic tier, which equals 72%. That leaves 28% of Canadians who would likely be satisfied with the kind of "skinny" OTA service that shared multiplexing offers.
7. Furthermore, the report from our poll of Kamloops residents, already on the record for this proceeding, indicates that 33% of Kamloops residents – including 33% of those who currently subscribe to cable – would choose a free, six-channel OTA offering instead of paying for cable or satellite. An even higher proportion – 42% - of people under the age of 35 would choose the six free channels. The channels suggested are: CFJC (the local Pattison station), CBC, Radio-Canada, Global BC, CTV and Knowledge Network. Three of those channels – CFJC, Radio-Canada and Global BC – are currently available in analogue over the air.
8. This is how digital multiplexing works: a broadcaster, or an entity licensed to provide digital OTA service in a particular community, establishes a digital transmitter on the allotted frequency and installs a multiplexer. Up to six participating broadcasters provide their signal to the transmitter. The signals are then broadcast from that transmitter on that frequency in standard definition. They will be picked up on the sub-channels of a single channel (eg. 20.1, 20.2, 20.3, 20.4, 20.5, 20.6) from any TV with an ATSC tuner or from an analogue TV with a digital converter box. Broadcasters could move to high-definition service with relatively simple equipment investments and with no disruption to viewers.
9. How would this be organized? It's possible for broadcasters to arrange the sharing in their markets, as they already do in 80% of transmitter sites. However, it may be more efficient for a federal agency to be given responsibility to administer the sites and the sharing, as the Freeview organization has done in the UK and New Zealand.
10. One way or another, the transition will cost the industry and the viewers. There is no getting around it. So, if money is to be spent, we urge you to look at the solution that will do the most for local Canadian TV while being the most affordable to consumers.

11. The attached research estimates that the average cost of upgrading an existing transmitter to digital in each of the communities with existing analogue service that are slated to be left behind in the transition, is \$156,000. This figure is derived from actual bids from suppliers for four different locations across the country. The cost study commissioned by the CRTC, and placed on the record for CRTC 2009-113, estimates an average of \$253,000 per site. The main differences between our estimate and the Commission estimate is a 25% contingency per location and building and power modifications.
12. Using our estimate at the low end of a range and the Commission study estimate at the high end, the total cost of upgrading the infrastructure to provide digital OTA TV in the approximately 977 communities currently served with analogue transmitters and slated to be left behind after the transition ranges between: \$140 million and \$227 million.
13. As we noted above, all a viewer would need to access these channels would be a TV with ATSC tuner or an analogue set with a relatively cheap converter box, as well as a set of rabbit ears or other antenna. These one-time costs to the viewer are very modest compared with the costs of the so-called “free” satellite services being proposed, which would cost an estimated \$400 to \$500 per TV set for necessary equipment, in addition to ongoing administrative costs that would be paid for from the Local Program Improvement Fund. Covering the cost of this equipment, assuming one TV per household and 590,000 households in the communities outside the CRTC’s mandated list, would require \$236 million to \$295 million, or substantially more than the cost of the multiplexes we propose, which would be accessible to ALL viewers in perpetuity using the most basic of equipment.
14. Information about the transition to digital needs to be better communicated across the board. In our Kamloops poll, we found that three-quarters of residents know little or nothing about it. Furthermore, the results suggest that there is a knowledge gap about what TV already exists in Kamloops, where three channels are currently available over the air: only 6% view TV over the air, but 20% said they would chose three channels over the air instead of paying for cable or satellite. Clearly, a significant proportion of people are not aware that they could tune to 3 stations over the air right now.
15. There is too little information available about how Canadians can access free, local TV over their public airwaves without subscribing to a BDU. Broadcasters, the Commission and the government could do a better job of letting people know.
16. However, without a comprehensive and coherent plan for the new reality, effective communication about the new reality is unlikely. The transition cannot be left up to a series of private decisions by broadcasters. The challenges in our country – a big geography, a sparsely distributed population and an underfunded public broadcaster – require a concerted and co-ordinated effort by all of the players.

17. Our recommendations:

- Require all conventional TV licencees to provide a digital OTA signal after the transition. The signal could be part of a shared multiplex.
- Immediately start working with broadcasters and the government to develop an orderly and co-operative plan, based on shared digital multiplexing, that phases in the provision of free digital TV signals to all of the communities that are currently served with analogue TV signals.
- **Establish a test site in Kamloops** with an existing local broadcaster or seek expressions of interest for a community TV provider in that city to initiate the pilot.
- Work with broadcasters and the federal government to develop a communications plan to ensure that Canadians get well-informed about the transition to digital TV.

*** END OF DOCUMENT ***

Sincerely,

Karen Wirsig
Communications Co-ordinator

**Research Report for the
Canadian Media Guild**

**The Over the Air Digital Television Transition
In Canada**

Final Report

**Prepared by
Olsen Enterprises**

July 8, 2008

Introduction

A worldwide transition is underway from analog to digital distribution of television services. This transition encompasses all delivery platforms: over the air (OTA), cable and satellite. Digital technology has long been the standard in the satellite industry and cable systems have been moving to that technology as well. The digital transition in the OTA sector is also underway. For North America in particular there are two looming deadlines for the cutoff of analog OTA signals. The US analog cutoff date is February 17, 2009 and the Canadian analog cutoff date is August 31, 2011.

The digital transition in the US is well advanced with the cutoff deadline less than one year away. The transition process has barely begun in Canada and many aspects of the digital transition remain unresolved and unclear.

- The regulatory regime for the new digital television landscape in Canada has not been finalized and the latest policy hearing concluded this spring, leading to subsequent decisions on the overall framework and regulations for digital television distribution in Canada.
- This latest policy hearing will be followed by individual License renewal hearings for the OTA broadcasters and the Specialty and Pay Services.
- The digital technologies for television distribution also continue to advance and the costs of these systems continue to decline.
- Consumer TV viewing habits are changing influenced by other emerging digital distribution platforms including the Internet and mobile devices.
- Most Canadian Broadcasters have not announced their respective plans for the digital transition.

This change and uncertainty presents all broadcast industry stakeholders in Canada with significant challenges going forward. The Phase 1 Research outlined the current status of the OTA digital transition in Canada and the US. Based on the publicly stated plans of Canadian broadcasters it seems that much of the existing analogue TV transmitter infrastructure in Canada will not be upgraded to digital as part of this transition.

The Phase 2 Research looked at the communities slated to be left behind in more detail and proposed models for the digital transition that would take advantage of the multiplex capability of the new digital television systems.

The Phase 3 Research focused on the specifics of existing sharing arrangements in these communities and provided costing scenarios for alternative multiplex models in the new digital television era. This Final Report includes the findings from all three of these Research Studies.

The Canadian Broadcasters Digital Transition Plans - Current Status

The CRTC in the Broadcasting Policy Monitoring Report 2007 indicated that as of December 31, 2006 there were 21 originating stations and five rebroadcasters authorized transitional digital OTA television licensees. These included 13 English services, seven French services and six Multi-language/English services. They are located in Montreal, Quebec, Ottawa, Toronto, Hamilton, Vancouver and Victoria.

In 2007 only two new applications for transitional digital OTA licenses were received and approved. These two applications were for rebroadcast transmitters. In 2007 there were also two applications for new HD OTA licenses. One was for a Toronto area service and the second was for a national service operating in eight major Canadian cities. These two applications are still under consideration by the CRTC. While the OTA sector was relatively quiet in 2007 with regard to the digital transition the Specialty and Pay sector was not. In 2007 there were nine new HD licenses issued for Specialty services, thirteen applications were approved for upgrades to HD by existing Specialty and Pay services and three more upgrade applications are still pending. To date there have been twice as many CRTC authorizations for HD distribution in the Specialty and Pay sector than in the OTA sector.

Industry Canada has also been proactive with respect to the digital transition and has already assigned digital television (DTV) frequency allocations for most of the analog TV transmitters currently operating in Canada.

In Broadcast Notice of Public Hearing CRTC 2006-5 the commission announced a hearing to "Review of certain aspects of the regulatory framework for over-the-air television". The public hearing commenced on Monday 27 November 2006 and a number of interested parties provided submissions to the commission and appeared at the hearing. One of the elements outlined in the CRTC agenda for this hearing was "to examine options for the most effective means of delivering Canadian digital/HD television to Canadians."

The CBC submitted a hybrid plan for digital/HD television with OTA DTV transmitters proposed for certain markets and satellite/cable BDU delivery in remaining markets. The CBC submitted the transmitter and market statistics as outlined below in the Table 1 - CBC Core Markets & Television Transmitters.

Table 1 - CBC Core Markets & Television Transmitters

	Analog Transmitters	Core Markets	Analog Transmitters	Digital Transmitters
English	480	14	39	28
French	182	8	13	16
Total	662	22	52	44

There is a fairly close match between the number of Analog Transmitters serving core markets and the proposed number of Digital Transmitters serving those same markets. The larger difference numerically in this transition plan is between the total number of Digital Transmitters proposed and the total number of Analog Transmitters operating today.

One other source for CBC TV station information is their web site. The CBC-owned and private affiliate TV stations are listed on the CBC web site and these are summarized below in Table 2 - CBC Owned & Affiliate Stations.

Table 2 - CBC Owned & Affiliate Stations

	Owned Stations	Affiliate Stations	Total Stations
English	18	9	27
French	8	5	13
Total	26	14	40

The actual geographic location on a city by city basis as listed on the CBC web site for each of these TV stations by Province and Territory is shown in Table 3 - CBC TV Stations by Province & Territory.

Table 3 - CBC TV Stations by Province & Territory

	Owned Locations	Affiliate Locations
Yukon/NWT/Nunavut	Yellowknife	
BC		
	Vancouver	Dawson Creek
	Vancouver (F)	Prince George
		Terrace
Alberta		
	Edmonton	Lloydminster
	Calgary	Medicine Hat
	Edmonton (F)	
Saskatchewan		
	Regina	
	Saskatoon	
	Regina (F)	
Manitoba		
	Winnipeg	Brandon
	Winnipeg (F)	
Ontario		
	London	Kingston
	Ottawa	Peterborough
	Toronto	Thunder Bay
	Windsor	
	Ottawa (F)	
Quebec		
	Montreal	Saguenay (F)
	Montreal (F)	Riviere-du-Loup (F)
	Quebec (F)	Rouyn (F)
		Sherbrooke (F)
		Trois-Rivieres (F)
Atlantic Provinces		
	St John's (NL)	
	Corner Brook (NL)	
	Charlottetown (PEI)	
	Halifax (NS)	
	Sydney (NS)	
	Fredericton (NB)	
	Moncton (NB) (F)	

As far as the number of stations and transmitters are concerned all the quantities quoted in the tables above do not match up exactly. The various numbers are: TV Stations in Table 2 (Total of 40); Analog Transmitter for Core Markets in Table 1 (Total of 52); and Proposed Digital Transmitters for Core Markets in Table 1 (Total of 44). They are all relatively close and are a reasonable reflection of what the CBC Television OTA

transmitter landscape will look like after August 31, 2011 if they proceed as planned with their digital transition. The net result is that 44 new DTV transmitters will be in operation and 618 of the existing CBC Analog TV Transmitters serving English and French Canadians may no longer be transmitting.

Many other broadcasters and interested parties also participated in the CRTC hearing process (Broadcasting Notice of Public Hearing CRTC 2006-5). Many of these Broadcasters also have one or more of the existing Digital OTA licenses discussed earlier and shown in Table 5 below. While each of these broadcasters provided comments on various aspects of the digital transition no specific plans or timetables were submitted for their respective networks. Many broadcasters did describe the size and nature of their current analog transmitter networks. These analog OTA transmitter networks are summarized in Table 4 - Various Other Analog OTA Transmitter Networks.

Table 4 - Various Other Analog OTA Transmitter Networks.

Networks	Main Locations	Small/Rebroadcast
CTV	25	89
CanWest Global	17	95
Chum	12	
TVO	24	165
TVFO	3	12
APTN		96
TQS	7	3
TVA	2	4
Total	90	464

The current authorized transitional digital OTA television licenses are summarized in Table - 5 Current OTA Digital Licenses.

Table 5 - Current OTA Digital Licenses

Market	Language	Call Sign	Broadcaster
Montreal	F	CFJP	TQS
	F	CBFT	SRC
	F	CIVM	Tele-Quebec
	F	CFTM	TVA
	E	CBMT	CBC
Quebec	F	CBVT	SRC
Ottawa	F	CBOFT	SRC

	E	CBOT	CBC
	O/E	OMNI 1	Rogers
	O/E	OMNI 2	Rogers
Toronto	F	CBLFT	SRC
	E	CBLT	CBC
	E	CFTO	CTV
	E	CIII	Global
	E	CITS	Crossroads
	E	CITY	CHUM
	E	CKXT	Quebecor
	O/E	OMNI 1	Rogers
	O/E	OMNI 2	Rogers
Hamilton	E	CHCH	Global
	E	CKXT	Quebecor
Vancouver	E	CBUT	CBC
	E	CHAN	Global
	E	CIVT	CTV
	O/E	CHNM	Multivan
Victoria	O/E	CHNM	Multivan

In Canada there are three years to the analog cutoff on August 31, 2011. There are a very few HD licenses currently issued or in operation. Only one Canadian broadcaster, the CBC, has put their overall digital transition plan on the public record. This lack of information and clarity regarding the digital transition presents somewhat of a problem for those trying to carry out any reasonable analysis and develop plans for the next three years. Therefore to establish a baseline digital transition scenario for Canada a number of assumptions must be made.

Most broadcasters have at least one license or operating HD station today and will most certainly establish more over the next 3 years. The question is how many. The baseline proxy network for HD OTA distribution in Canada that we propose is based on the following assumptions.

1. When one broadcaster launches HD OTA in a particular market the others will follow.
2. All the cities as outlined in Table 5 would therefore be included.
3. As CBC has put forward a plan for their major markets, all the cities in Table 3 would be included.

While this might not represent all the exact cities that will have HD OTA service by August 31, 2001 it should be a reasonable minimum baseline for the purpose of further analysis.

The Existing OTA Analog Infrastructure in Canada

The next step in the analysis is a review of the total current OTA infrastructure in Canada to identify any gaps in coverage that may exist between the existing analog networks and the proposed digital networks. There are currently a total of over 2400 analog television transmitters operating in Canada. These include large public and private facilities in all the major Canadian population centers as well as approximately 2000 lower powered transmitters and repeaters in the less populated areas of the country. CBC is the largest single operator of these facilities with 662 television transmitters.

Based on the assumptions outlined above regarding the cities that would be part of the baseline digital transition in Canada, a number of communities are left out. These are summarized in Table 6 - Remaining Analog OTA Communities/Transmitters

Table 6 - Remaining Analog OTA Communities/Transmitters

	1 Transmitter	2 Transmitters	3 Transmitters	4 or More Transmitters	Total
British Columbia	83	40	37	39	199
Alberta	29	17	10	9	65
Saskatchewan	33	15	6	7	61
Manitoba	37	4	3	2	46
Ontario	167	48	27	11	253
Quebec	71	23	14	10	118
New Brunswick	11	5	2		18
Nova Scotia	27	11	2	7	47
Prince Edward Island	1		1		2
Newfoundland	76	14	1		91
Yukon	5	14	2	1	22
Northwest Territories	11	13	2	3	29
Nunavut	8	12	5	1	26
Total Communities	559	216	112	90	977
Total TV Transmitters	559	432	336	602	1929

A total of 977 communities in this scenario would be left out of the digital transition in Canada. These communities are listed by Province and Territory and are also characterized by the number of existing analog transmitters in operation.

All the broadcasters at the CRTC hearing spoke to the significant costs for upgrading their total current network facilities to digital. Each spoke to their own individual costs apparently without regard to the possibility of cost sharing these upgrades with other broadcasters. As shown in Table 6 above, 43% of the communities are served by multiple broadcast transmitters today thus presenting a logical cost sharing opportunity in the

digital transition phase. In the new digital world the cost sharing opportunity is further enhanced as multiple analog modulators can be replaced by one digital modulator and each broadcaster can share that new facility on a multiplexed basis.

For the 57% of the communities with only one transmitter no current sharing options exist. Again the new digital world could provide new television viewing opportunities for these communities by using the multiples capability of the new digital transmitter to add other television services not currently available in these communities.

If broadcasters continue to study and cost out digital scenarios based solely on their own networks without regard to existing or future cost sharing opportunities with other broadcasters operating in the same communities then the view shown above of 977 communities being left out of the digital revolution may very well come true.

The US Digital Transition

The digital transition in the US is well advanced and the analog cutoff date of February 17, 2009 is less than a full year away. For many years now the focus in the US has been toward building the new digital facilities and most of that work is now complete. The current focus in the last remaining year to the deadline is the viewer and viewer education regarding the pending cutoff date.

In terms of DTV transmitters on air in the US as cited on the NAB web site as of February 21, 2008 there were 1629 stations reported to be on air in 212 markets with digital signals. In terms of markets the metrics are a 100% digital coverage in the top 30 US markets and 95% in the remaining commercial markets. As the 2009 deadline approaches these later numbers will continue to increase on a monthly basis.

There may be some misconceptions related to the analog cutoff in the US. The legislative mandate for the analog cutoff is for "Full Power" TV stations and while they serve the vast majority of the viewers in the US they do not include all TV transmitters currently in operation. There are 3 classes of TV transmitters that are excluded from the mandatory analog cutoff, "Low Power" or LPTV, Class A stations and TV Translators stations. All three are low power and the TV Translators are what are normally referred to as repeaters in Canada. There are currently 7400 of these transmitters licensed and operating in the US. The transition to digital for these facilities is optional and 2000 have already applied for a digital construction permit and are preparing for digital conversion. The FCC is currently considering the remaining issues involved with the low power digital transition and will make decisions regarding these stations at some point in the future.

If Canada were to follow the US model then the 2011 deadline could be for major markets much like the 2009 deadline in the US and the remainder of the transmitter universe would be upgraded at some later date. Depending on definition of market size this later phase could include some or all of the 970 communities shown in Table 6. With digital technology, generally later is better from a cost and performance perspective.

The current focus of all the stakeholders in the US is the viewer and viewer education. When the analog cutoff is implemented none of the existing analog TV sets will be able to receive any television programs. With 20% of the viewers in the US relying on OTA service this has become an important issue. Consumers who have purchased digital TV sets will be okay, as will subscribers to satellite or cable services. It will be the OTA analog viewers who will lose their signals in February 2009.

To deal with this issue the US Government has a budget of \$890M for a coupon program. Each coupon is valued at \$40 and can be used at television retailers to purchase a low cost set top box that will convert the new digital television signals back to analog for display on analog TV sets. Each household is eligible to apply for two coupons each and applications began to be accepted starting January this year. It is expected that legacy analog TV sets will present a similar issue in Canada as the analog cutoff date approaches.

One last issue in the US transition that also can relate to the Canadian market is that of digital multiplexing. When the new digital standard was established and the first systems were implemented, broadcasters had two basic choices with the new digital channel: 1) broadcast a single HD signal or 2) broadcast multiple SD signals in a multiplexed mode. In the early days both options were prevalent in various US markets. Technology advances have been such that, in recent years, the latest digital encoders allow transmission of an HD signal and one or more SD signals in some instances on a single channel. Not much seems to have been done or talked about in Canada, to explore the benefits of the multiplex capability of the new digital television transmitters. As noted above this technical capability of a digital system could provide an economic alternative for broadcasters to implement digital OTA service in some of the smaller markets.

Baseline Digital Transition Plan

The announced plans of the OTA broadcasters and the current status of DTV transitional licenses were reviewed leading to a list of cities assumed to be included in the OTA Digital transition. These cities are summarized below in Table 7 - Assumed Digital Transition Communities.

Table 7 - Assumed Digital Transition Communities

Digital Transition Communities		
Yukon/NWT/Nunavut	Yellowknife	
BC	Vancouver	Dawson Creek
	Terrace	Prince George
	Victoria	
Alberta	Edmonton	Lloydminster
	Calgary	Medicine Hat
Saskatchewan	Regina	Saskatoon
Manitoba	Winnipeg	Brandon
Ontario	London	Kingston
	Ottawa	Peterborough
	Toronto	Thunder Bay
	Windsor	Hamilton
Quebec	Montreal	Saguenay
	Quebec	Riviere-du-Loup
	Sherbrooke	Rouyn
	Trois-Rivieres	
Nova Scotia	Halifax	Sydney
New Brunswick	Fredericton	Moncton
Newfoundland	St John's	Corner Brook
Prince Edward Island	Charlottetown	

The Communities Left Behind In the OTA Digital Transition

Taking the communities listed in Table 7 out of the mix leaves the remainder as the "communities left behind". A complete list of communities left behind in the Digital Transition is provided in Appendix A. The list is organized by Province and Territory and shows which OTA television service or services are currently operating in each community. One additional column is also provided in the listing to identify communities with more than one OTA transmitter that currently have a sharing arrangement amongst some or all the broadcasters at the transmitter location.

All the information provided in Appendix A was taken from the Industry Canada Broadcasting Database as of February 15, 2008. This database is updated on a weekly basis. For the purposes of this study the Broadcasting Database used in all of the analysis will be the February 15, 2008 version.

Assumptions:

- The communities listed in Appendix A are those expected to be left out of the digital television transition
- Only operating transmitters are shown; transmitters authorized but not yet in operation are not included
- MMDS transmitters are not included
- The television services shown in each community are identified by the codes listed in Table A below
- In some cases the Television Service listed in the Industry Canada Database does not reflect the local broadcaster's current affiliation arrangement
- When a Cancom service is shown the specific nature of the service is not known
- Where sharing is identified for a community it reflects either partial or total sharing of transmitter facilities by the broadcasters in that community
- Sharing is assumed if the different television transmitters in a community have the same latitude and longitude listed in the Industry Canada Database

Table A Station Codes

Station Code	Television Service
CBCE	CBC English
CBCF	Radio-Canada (CBC French)
CTV	CTV
Global	Global
TVA	Telediffuseurs Associés
TVNC	APTN
TVO	TV Ontario
KNOW	Knowledge Network
Ind	Independent English
IndF	Independent French
TQS	TQS
R-QF	Tele-Quebec
AECC	Alberta Educational Comm. Corp
Canc	Cancom Service

Table 6 -Remaining Analog Communities/Transmitters summarized by Province and Territory are the communities left unserved after the digital transition. It also showed the number of communities with different quantities of OTA analog television transmitters. This Table has been updated based on the list of communities included in Appendix A and the associated assumptions used to develop that list. The updated and expanded

scope of the table is shown below as Table 8- Remaining Analog Communities/Transmitters/Sharing.

The element of additional scope that has been added to this table reflects the number of communities with more than one television transmitter where a sharing arrangement between at least two television services in that community exists. In many cases the sharing arrangement includes all television services in that community. As shown in Table 8, there are projected to be 977 communities across Canada left out of the digital transition. Of these, 559 have a single transmitter and 418 have multiple transmitters.

When it comes to sharing, there are 334 communities with an existing sharing arrangement related to the operation of the analog television transmitters. This represents 80% of all the multiple transmitter locations across Canada. There are two basic variations in these sharing scenarios. One is where a broadcaster has more than one transmitter at a particular location: for instance a CBC English and CBC French service in the same community. There are also many instances of a similar arrangement with TVO providing both English and French services in the same community. These sharing arrangements with the same broadcaster represent about 30% of the total 80% that have sharing. The second basic scenario for sharing arrangements is locations where two different broadcasters such as CBC and CTV have a sharing arrangement. These cases represent 50% of the total 80% that have sharing

Table 8- Remaining Analog Communities/Transmitters/Sharing

	1-Tx	2-Txs	3-Txs	4 or More Tx	Total	2+Txs	Sites Sharing	%/Sites Sharing
British Columbia	83	40	37	39	199	116	96	83%
Alberta	29	17	10	9	65	36	27	75%
Saskatchewan	33	15	6	7	61	28	22	79%
Manitoba	37	4	3	2	46	9	9	100%
Ontario	167	48	27	11	253	86	66	77%
Quebec	71	23	14	10	118	47	45	96%
New Brunswick	11	5	2		18	7	5	71%
Nova Scotia	27	11	2	7	47	20	9	45%
Prince Edward Island	1		1		2	1	1	100%
Newfoundland	76	14	1		91	15	9	60%
Yukon	5	14	2	1	22	17	9	53%
Northwest Territories	11	13	2	3	29	18	18	100%
Nunavut	8	12	5	1	26	18	18	100%
Total Communities	559	216	112	90	977	418	334	80%
Total TV Transmitters	559	432	336	602	1929	1370		

The high percentage of communities with multiple television services provides a natural and logical base for continued sharing should these communities be upgraded to a digital service. While the scope of this study did not permit a detailed evaluation of all 334

shared locations, there are some basic sharing assumptions that would likely apply in most cases. Two television services at the same latitude and longitude would normally have sharing that would encompass the following

- land including road access and site development
- building including access
- power and HVAC
- the antenna structure

The elements that would be unique to each broadcaster would include the signal source or backhaul, all the dedicated equipment in the transmitter chain and the antenna for that particular service.

A New Model for Digital Transition in Canada

The 977 communities identified above that will be left out of the digital transition fall into three broad categories:

- 1) The 559 with only one analog television transmitter;
- 2) The 334 with multiple analog transmitters and an existing sharing arrangement and,
- 3) The 84 with multiple analog transmitters and no existing sharing arrangement.

These three broad categories will be evaluated in the context of a model that is based on the ability of a digital television transmitter to transmit a single digital High Definition (HD) signal or up to 6 digital Standard Definition (SD) signals.

One of the main points raised by broadcasters regarding these "communities being left behind" in the digital transition is the significant level of digital upgrade costs. This model will explore ways of mitigating those costs so that all the viewers in these communities will continue to have free OTA television in the new digital world.

The model for communities with more than one analog television service today is simple. Provision a single digital transmitter in these communities and have each of the existing broadcasters up to a maximum of six share that facility by transmitting a digital SD signal. This model in the 334 communities with sharing today in the analog world really represents a simple extension of the business arrangements in place today. The cost of the new digital equipment will be shared by all broadcasters and cost savings on a variety of fronts will result as only one new digital transmitter will be in operation versus the number of multiples of analogue transmitters are in existence today. This model will be somewhat more complicated in the 84 communities without sharing today but the shared digital costs and cost savings will still result.

In the 559 communities with only a single analog television transmitter today, a different approach is required to deal with the cost factor. The same model, using up to six SD signals on a digital transmitter, would be used to provide additional OTA services in these communities. The benefit would be two fold: first, other broadcast operators would share in the digital upgrade costs and the ongoing operating costs and second, the television viewers in these 559 communities would have improved OTA television

service. This approach of providing new services over and above what is in existence today would also work with the locations identified above with multiple transmitters and less than six currently operating analog transmitters.

The Digital Television Transition Worldwide

The OTA digital television transition is currently underway in countries representing every region of the world: North America, South America, Europe, Asia and Africa. This is clearly the most significant technological development in the television industry since the introduction of colour television decades earlier. Digital television technology has been the standard for satellite-based delivery systems for many years and all satellite-based systems operate using digital technology today. Cable systems worldwide have also been introducing digital services. They are gradually migrating analog customers over to the digital platforms.

In Canada the penetration of digital systems over cable is currently over 50%. The OTA digital transition when complete will move the last technology component of the television distribution infrastructure from analog to digital.

In the analog television era every channel, either OTA, cable or satellite carried one analog television signal. In the new digital era every channel, OTA, cable or satellite can carry several television signals. The digital technology that permits multiple television signals in a single channel is called digital multiplexing. Digital multiplexing is used with all digital cable and satellite systems and multiplexing is also used in most of the digital OTA deployments worldwide.

With analog television there were several standards and formats worldwide. The same is true with digital television systems, but there are two key variants with the new digital systems that will be the main focus in this study. These two elements are the Standard Definition digital signal (SD) and the High Definition digital signal (HD). The main differences between these two elements are the overall picture quality and the amount of digital capacity required to deliver each signal.

To put these differences between SD and HD in some perspective we look to the US where the OTA digital transition is very well advanced. The current state of the art in digital television technology is allowing broadcasters to provide the following range of services in a single OTA channel using digital multiplexing.

- 2 HD signals per channel
- 1 HD signal & 3 SD signals per channel
- 6 SD signals per channel

There are other combinations and variations that are possible but this study will focus on these three in some detail.

One other perspective relating to HD versus SD is: which one is the main focus of the OTA digital transition in the various countries. Most system deployments worldwide are currently SD focused. Some of these have an upgrade path to HD while others currently

do not. There are four countries with a HD focused digital transition: Canada, the United States, Mexico and Japan. In the US, while the focus is HD, multiplexed SD is also permitted and in widespread use. This multiplexed SD option is currently not on the agenda in Canada and this report will look at some of the implications if this approach were to be considered for Canada including the value to both the broadcasters and the television viewers.

Sharing at the "Communities Left Behind" in the OTA Digital Transition

The communities slated to be left behind along with an indication of existing sharing arrangements at multiple transmitter sites was summarized in Table 8. This summary will serve as the foundation for the next steps in the analysis. This table provides a view of the distribution of communities across Canada on a Provincial and Territorial basis that would be without free OTA television service when the digital transition is completed nationwide.

One important point regarding the 977 communities assumed to be left behind in the digital transition is the significant level of sharing for services and facilities amongst different broadcasters at the existing analog transmitter sites. As is evident, this sharing principle amongst broadcasters is very well established and is most likely borne of business necessity in terms of finding a way to economically provide television service to all Canadians even in smaller communities. As will be described later, taking this well established sharing approach into the new digital television environment has the potential to reduce digital conversion costs and ongoing operating costs while in some instances providing additional television services.

To provide a more detailed view of the sharing arrangements amongst broadcasters, the following tables are included to elaborate further. This part of the analysis is provided for the two-transmitter site category only. Similar results would also be present in the three and four transmitter categories.

In the following tables detailing sharing arrangements, broadcasters will be identified by short form acronyms. These are outlined in Table A Station Codes in Appendix A.

There are two key assumptions regarding Appendix A that warrant repeating. The first is that the information in Appendix A was based on the Industry Canada Broadcasting Database as of February 15, 2008. Secondly, in some cases the Television Service listed in the Industry Canada Database does not reflect the local broadcasters current affiliation arrangement. This last fact became obvious in a number of instances during the research process but the analysis below will still reflect the February 15, 2008 database values for consistency purposes. While a number of changes could be made to reflect the current affiliation arrangements they would not change the overall picture significantly or the conclusions of the study.

A summary of how many sites the different broadcasters currently share by Province and Territory in the two-transmitter category is shown in Table 9 - Broadcaster Sharing Relationships by Province and Territory.

Table 9 – Broadcaster Sharing Relationships by Province and Territory

	2-Tx Sites						
British Columbia	40	CBCE/CTV 20	CBCE/Know 6	CBCE/Global 2	CTV/Know 3		
Alberta	17	CBCE/CTV 7	CBCE/CBCF 3				
Saskatchewan	15	CBCE/CTV 10	CBCE/CBCF 3				
Manitoba	4	CBCE/CTV 4					
Ontario	48	CBCE/TVO 14	TVO/TVO 20	CBCE/CBCF 5	CBCE/CTV 3	CBCF/TVO 3	CBCE/Global 1
Quebec	23	CBCE/CBCF 16	CBCF/TVA 4				
New Brunswick	5	CBCE/CTV 6	CBCF/TVA 2				
Nova Scotia	11	CBCE/CTV 6	CBCE/CBCF 2				
Prince Edward Island							
Newfoundland	14	CBCE/CTV 6	TVNC/CBCE 5	CBCE/CBCF 2			
Yukon	14	TVNC/CBCE 13					
Northwest Territories	13	TVNC/CBCE 13					
Nunavut	12	TVNC/CBCE 12					

In this table a number of geographic patterns are obvious. In the Territories, TVNC plays a major role in the sharing arrangements. In the Provinces CBC and CTV are near the top of the list. In Provinces like Ontario and British Columbia the educational broadcasters TVO and Knowledge are near the top to the list.

There are two points of clarification on terminology in the Industry Canada Database. TVNC is the listed name in the Industry Canada Database but today is known as APTN. Secondly, all the listings for TVO in the Industry Canada Database actually include transmitters for three separate services, TVO, TVFO and OLA.

A second view on sharing at the two transmitter sites from a national perspective shows the totals for each of the broadcaster sharing pairs and the percentage of the total that particular pair represents. The second half of the chart shows the total number of sites per broadcaster in the two-transmitter category that are in a sharing arrangement. This is shown in Table 10 – National Totals for Sharing Between Broadcasters.

Table 10 – National Totals for Sharing Between Broadcasters

Sharing Partners	2 Transmitter Sites	Percent Of Total	Total Shared	2 Transmitter Sites	Percent Of Total
CBCE/CTV	62	28.70%	CBCE	141	65.28%

CBCE/TVNC	41	18.98%	CTV	68	31.48%
TVO/TVO	20	9.26%	TVNC	41	18.98%
CBCE/CBCF	15	6.94%	TVO	37	17.13%
CBCE/TVO	14	6.48%	CBCF	24	11.11%
CBCE/Know	6	2.78%	Know	12	5.56%
CTV/Know	6	2.78%	TVA	6	2.78%
CBCF/TVA	6	2.78%	Global	3	1.39%
CBCF/TVO	3	1.39%			
CBCE/Global	3	1.39%			

While there are numerous different sharing arrangements today what is very clear is that the CBC has been the most active participant in sharing arrangements and that would also be the case in any new digital sharing arrangement.

The 559 single transmitter sites identified in Table 8 and Appendix A currently are not part of any sharing arrangement by definition. However, in the new digital television era that could easily change and that possibility will be explored later in this report. Table 11 – Single Transmitter Sites per Broadcaster will show how many of the single transmitter sites are operated by the various Canadian broadcasters to once again add perspective to the discussion that will follow.

Table 11 – Single Transmitter Sites per Broadcaster

Television Service	1 Transmitter Sites	Percent Of Total
CBCE	236	42.22%
TVO	138	24.69%
CBCF	64	11.45%
CTV	36	6.44%
TVNC	31	5.55%
Know	20	3.58%
IND	16	2.86%
Global	10	1.79%
TVA	4	0.72%
R-QF	3	0.54%
TQS	1	0.18%
Total	559	100%

Once again CBC would be the most involved broadcaster in any future digital sharing arrangement at what are currently the single transmitter analog locations.

Costing Models for the Digital Transition

In the discussion of the worldwide digital transition earlier in this report, three state of the art scenarios for the numbers and types of signals that can be carried in a single channel

were described. These scenarios are based on current practice and experience with the US digital transition.

- 2 HD signals per channel
- 1 HD signal & 3 SD signals per channel
- 6 SD signals per channel

A baseline “status quo” view has been added to these scenarios for comparative cost purposes. The status quo scenario is based on the digital transition plan currently being implemented in Canada, which has 1 HD signal for each TV transmitter. This provides four basic options for comparison. These four models will be referred as the:

- Status Quo Model – 1 HD signal, 1 Transmitter
- HD Multiples Model – 2 HD signals, 1 Transmitter or 4 HD signals, 2 transmitters
- HD&SD Multiplex Model – 1 HD signal & 3 SD signals, 1 Transmitter
- SD Multiples Model – 6 SD signals, 1 Transmitter

Each of these models is shown diagrammatically in the following figures.

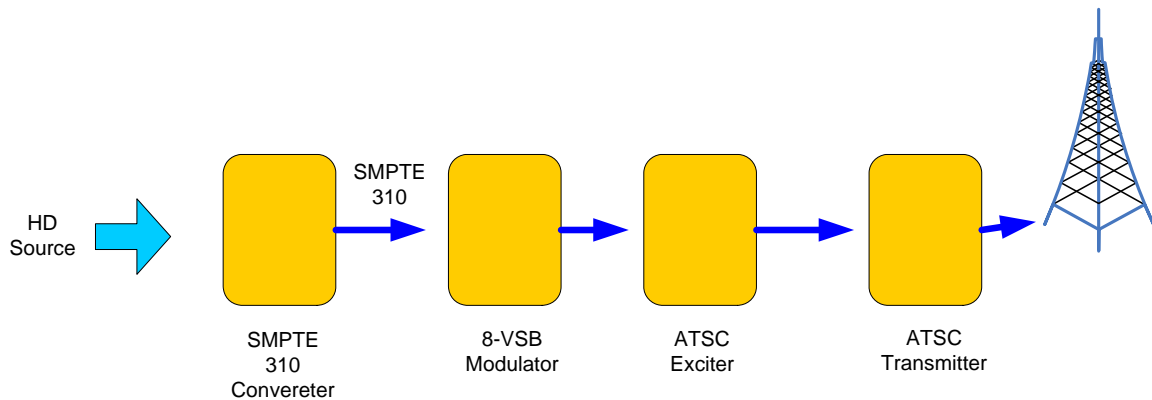


Figure 1
1-HD Service, 1 Transmitter
(Status Quo Model)

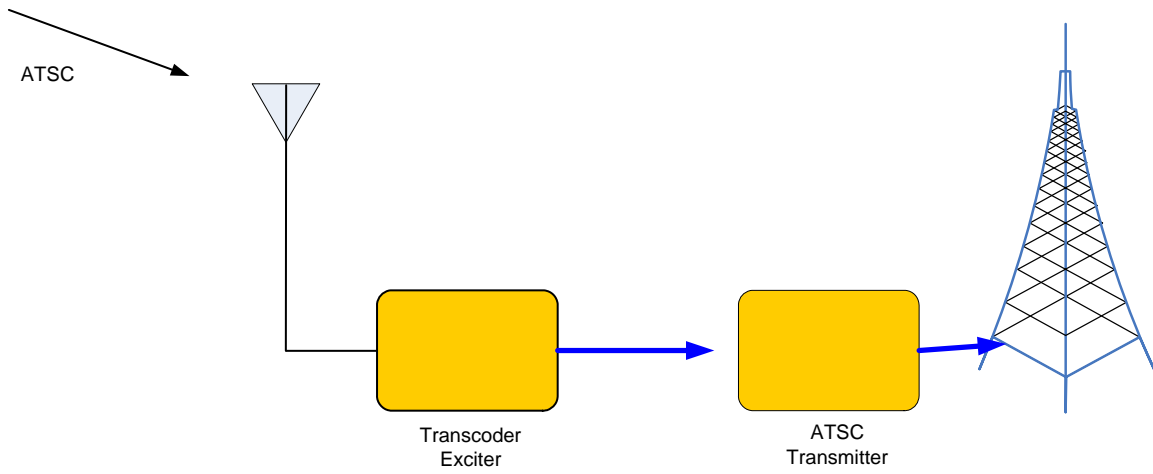


Figure 1A
1 HD Service, 1 Transmitter
DTV Broadcast Repeater
(Status Quo Model)

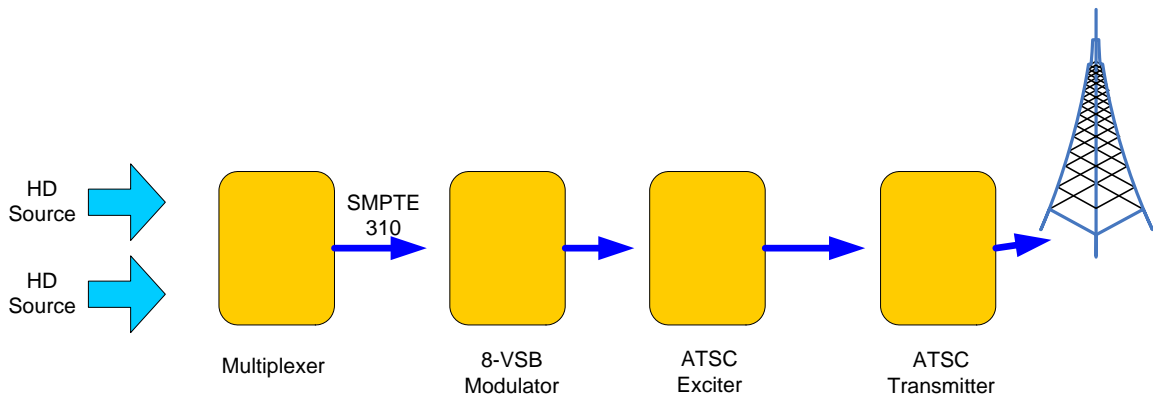


Figure 2
2-HD Services, 1 Transmitter
(HD Multiplex Model)

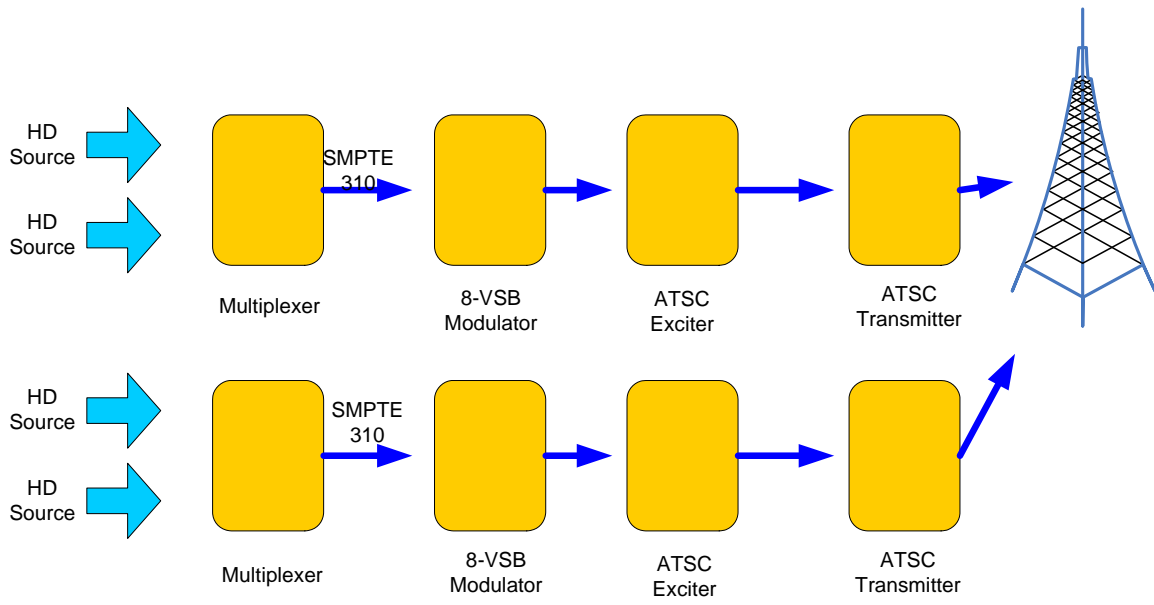


Figure 2A
2 HD + 2 HD, 2 Transmitters
(HD Multiplex Model)

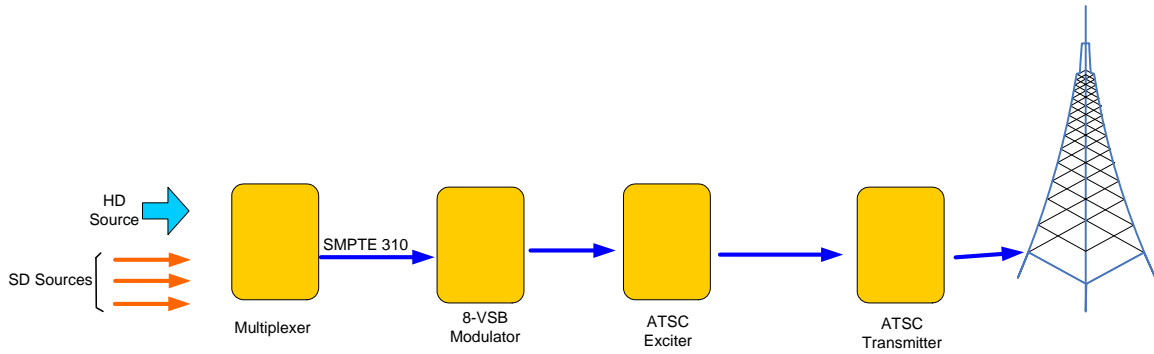


Figure 3
1HD, 3 SD, 1 Transmitter
(HD & SD Multiplex Model)

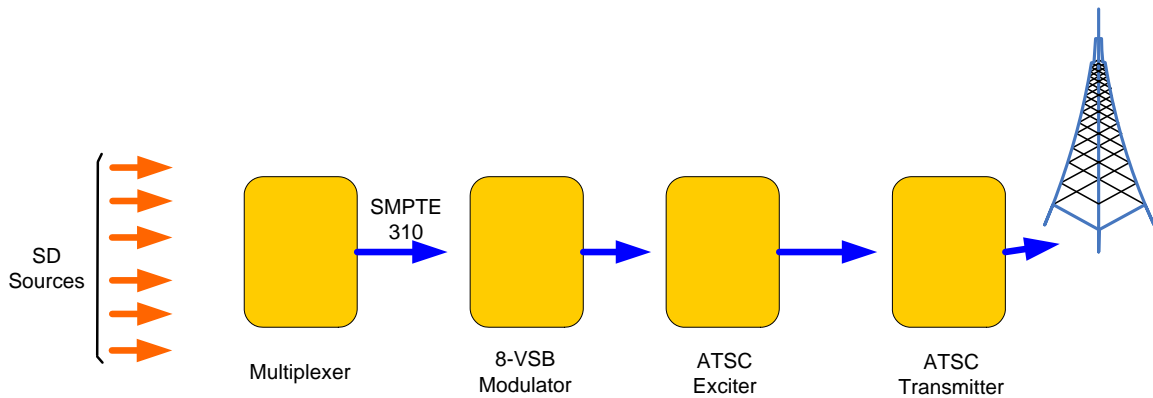


Figure 4
6 SD Services, 1 Transmitter
(SD Multiplex Model)

All the models depicted in the Figures above will be carried forward in the analysis except for the rebroadcast model in Figure 1A. This model will cost approximately \$10,000 less than the model shown in Figure 1. If the specific site in question were a rebroadcast transmitter then the Figure 1A approach would be the logical economic choice. Many of the 559 single transmitter locations and some in the various shared scenarios will fall into this category. To be conservative in the following cost analysis and cost comparisons, the Figure 1 model will be used in all views presented.

A list of sample sites for costing was developed and is provided here as Table 12 – Sample Sites for Costing.

Table 12 – Sample Sites for Costing

	1-Transmitter	2-Transmitters	3-Transmitters	4 or More Tx
British Columbia	Fort St John	Houston	Kamloops	Kelowna
Alberta	Fort Vermilion	Hinton	Peace River (Note 2)	
Saskatchewan	La Ronge	Gravelbourg	Prince Albert	
Manitoba	Churchill	Dauphin	The Pas	Thompson
Ontario	Oshawa	Penetanguishene	Wawa	Kenora (Note 2)
Quebec	Havre-St-Pierre	Chibougamau	Gaspe	Radisson
New Brunswick	Bon Accord	St-Quentin (Note 1)	Campbellton (Note 2)	
Nova Scotia	Liverpool	Digby	Mulgrave	

Prince Edward Island	Elmira		St Edward	
Newfoundland	St Anthony	Goose Bay		
Yukon	Keno	Watson Lake (Note 1)	Whitehorse (Note 2)	
Northwest Territories	Norman Wells	Fort Simpson (Note 1)	Fort Smith (Note 1)	
Nunavut	Cape Dorset	Igloolik (Note 1)		

Notes:

Note 1 - Transmitter sites that do not currently have a digital frequency assigned in the Industry Canada Digital Television (DTV) Transition Allotment Plan

Note 2 - Transmitter sites that are currently not co-located and therefore do not have an existing sharing arrangement

The locations listed in Table 12 were reviewed to develop averages in terms of transmitter power to provide a basis for developing typical average digital conversion costs. From Table 12 four specific sites were also chosen for costing with one in each of the four categories. These four chosen sites are Elmira, Gravelbourg, Kamloops and Radisson.

An assumed typical site cost for each category was developed from averages calculated using the communities listed in Table 12. The costing for the typical sites is shown in Table 13 – Typical Site Costs.

Table 13 – Typical Site Costs

DTV Transmitter Costing				
		1- HD Service	2- HD Services	3 & 4 – HD Services
<u>Item</u>	<u>Description</u>	<u>Cost (\$000)</u>	<u>Cost (\$000)</u>	<u>Cost (\$000)</u>
1	Equipment:			
1.1	Antenna			
1.2	Transmission Line			
1.3	Exciter/Transmitter	78	78	156
1.4	Mask Filter/Combiner	9	9	23
1.5	Multiplexer		24	48
2	Shipping	5	5	8
3.1	Project Management	10	10	10
3.2	Installation & Commissioning	20	20	30
4	Travel & Living	10	10	15
	Total	132	156	290

The costing process also required that a number of assumptions be made. The general assumptions for these cost models are as follows.

- The signal provided at the transmitter location will be in a suitable format to interface with the digital transmit equipment,
- There would not be any dual transmission of the current analogue signal and new digital signal. The existing transmitter would be removed and then the new digital transmitter would be installed and tested. This would result in the television service being off the air for a period of several hours to several days depending on the site-specific complexity,
- The analogue ERP is derived from the Industry Canada Broadcasting database while the digital ERP is derived using the rule of thumb that the digital signal would be 12 dB lower than the analogue signal to achieve the same coverage,
- The transmitter size is determined using the rule of thumb that the transmitter output power would be 20% of the ERP,
- The existing tower is capable of supporting the new antenna, where required,
- Costing for a new antenna and transmission line when they are required is not included,
- Redundant transmitter configurations are not included but might be considered for multiple service transmitters,
- Costs for any additional power or HVAC are not included as in most cases it is expected that these costs will be reduced,
- Costs for site surveys are not included, as all sites are existing operating sites today.
- Costs are budgetary and do not include any applicable taxes.

A summary of the comparative costing model results is shown in Table 14 - Summary of Costing Results.

Table 14 - Summary of Costing Results

Current Community Status	1 Transmitter	2 Transmitters	3 Transmitters	4 Transmitters
Status Quo Model-Services Provided				
Status Quo Model-Services Provided	1-HD	2-HD	3-HD	4-HD
Number of Transmitters	1	2	3	4
Incremental Cost	\$132,000	\$264,000	\$396,000	\$528,000
Cost per Service	\$132,000	\$132,000	\$132,000	\$132,000
HD Multiplex Model-Services Provided				
HD Multiplex Model-Services Provided	2-HD	2-HD	2+2-HD	2+2-HD
Number of Transmitters	1	1	2	2
Incremental Cost	\$156,000	\$156,000	\$290,000	\$290,000
Shared Cost per Service	\$78,000	\$78,000	\$72,500	\$72,500
HD&SD Multiplex Model-Services Provided				
HD&SD Multiplex Model-Services Provided	1-HD & 3-SD	1-HD & 3-SD	1-HD & 3-SD	1-HD & 3-SD
Number of Transmitters	1	1	1	1
Incremental Cost	\$156,000	\$156,000	\$156,000	\$156,000

Shared Cost per Service	\$39,000	\$39,000	\$39,000	\$39,000
SD Multiplex Model-Services Provided	6-SD	6-SD	6-SD	6-SD
Number of Transmitters	1	1	1	1
Incremental Cost	\$156,000	\$156,000	\$156,000	\$156,000
Shared Cost per Service	\$26,000	\$26,000	\$26,000	\$26,000

In Table 14 there are a total of 16 cost views presented. The digital upgrade cost for each type of community is shown, as is the shared cost for each of the existing and potential broadcast services in that community. Only 7 of the 16 different views provide the exact same service level in terms of number of television signals as is provided today in analog. The other 9 all have the capability to provide additional television services to what is in place today.

It is not surprising that as one moves down the chart from the Status Quo Model, to the HD Multiplex Model, to the HD&SD Multiplex Model and finally the SD Multiplex Model that the cost per television service in all the scenarios decreases. There are several factors for this trend. The first is multiplexing which by its nature is all about sharing a resource and therefore costs. Some of the multiplexed scenarios also allow for additional services, which also reduces individual service costs. And finally several of the multiplex scenarios include SD services, which also allows for additional services and reduced costs per service.

The costing measure that best captures all these impacts is the cost per service. The cost per service and the percentage differential between the different models is summarized in Table 15 – Cost per Service Model Comparison.

Table 15 – Cost per Service Model Comparison

	Per Service Cost	Model Comparison	% Difference
Status Quo Model	\$132,000		
HD Multiplex Model	\$78,000	Status Quo to HD	-41%
HD&SD Multiplex Model	\$39,000	HD to HD&SD	-50%
SD Multiplex Model	\$26,000	HD&SD to SD	-33%
SD Multiplex Model	\$26,000	Status Quo to SD	-80%

The combined impact of multiplexing, additional services, and permitting SD services is clearly significant on a per service basis and should warrant serious consideration.

The four sites noted earlier that were chosen for site-specific costing were reviewed and the digital transition costs for each is shown in the following tables. In each case the cost to upgrade the current services to HD is shown, as is the comparable cost for the 6 SD Multiplex model.

Elmira, PEI was the site chosen for the single transmitter site-specific example.

Table 16 – Elmira Site Costs

DTV Transmitter Costing			
<u>Item</u>	<u>Description</u>	1 HD Service <u>Cost (\$000)</u>	6 SD Services <u>Cost (\$000)</u>
1	Equipment:		
1.1	Antenna		
1.2	Transmission Line		
1.3	Exciter/Transmitter	18	18
1.4	Mask Filter	9	9
1.5	Multiplex		24
2	Shipping	2	2
3.1	Project Management	5	5
3.2	Installation & Commissioning	10	10
4	Travel & Living	5	5
	Total	49	73

In addition to the General Assumptions shown above, the site-specific assumptions for Elmira includes:

- Requires a new antenna (currently VHF, going to UHF),
- The Rebroadcast model is used,
- The five additional TV services in the 6 SD Model are yet to be determined.

Gravelbourg, Saskatchewan was the site chosen for the two-transmitter site-specific example.

Table 17 – Gravelbourg Site Costs

DTV Transmitter Costing			
<u>Item</u>	<u>Description</u>	2 HD Services <u>Cost (\$000)</u>	6 SD Services <u>Cost (\$000)</u>
1	Equipment:		
1.1	Antenna		
1.2	Transmission Line		
1.3	Exciter/Transmitter	78	78
1.4	Mask Filter	9	9
1.5	Multiplex	24	24
2	Shipping	5	5
3.1	Project Management	10	10

3.2	Installation & Commissioning	20	20
4	Travel & Living	10	10
Total			
		156	156

In addition to the General Assumptions shown above, the site-specific assumptions for Gravelbourg includes:

- One of the existing antennas can be used for the new digital service,
- The 2 HD-1 Transmitter model is used
- The four additional TV services in the 6 SD Model are yet to be determined.

Kamloops, BC was the site chosen for the three-transmitter site-specific example.

Table 18 – Kamloops Site Costs

DTV Transmitter Costing			
Item	Description	3 HD Services Cost (\$000)	6 SD Services Cost (\$000)
1	Equipment:		
1.1	Antenna		
1.2	Transmission Line		
1.3	Exciter/Transmitter	42	21
1.4	Mask Filter	23	9
1.5	Multiplex	48	24
2	Shipping	4	4
3.1	Project Management	7	7
3.2	Installation & Commissioning	15	15
4	Travel & Living	8	8
Total			
		147	88

In addition to the General Assumptions shown above, the site-specific assumptions for Kamloops includes:

- The transmitter site is currently shared by CBUFT with CJFC-TV and CHKM-TV
- The sharing is continued with the two of the services being multiplexed onto one transmitter and the third service on a second transmitter,
- This arrangement could allow a fourth channel (CBCE) to be added to the location,
- The 4 HD- 2 Transmitter model is used but with only 3 HD services (assumes CJFC-TV and CHKM-TV will be HD),
- The three additional TV services in the 6 SD Model are yet to be determined.

Radisson, Quebec was the site chosen for the four-transmitter site-specific example.

Table 19– Radisson Site Costs

DTV Transmitter Costing			
<u>Item</u>	<u>Description</u>	4 HD Services <u>Cost (\$000)</u>	6 SD Services <u>Cost (\$000)</u>
1	Equipment:		
1.1	Antenna		
1.2	Transmission Line		
1.3	Exciter/Transmitter	36	18
1.4	Mask Filter	26	9
1.5	Multiplex	48	24
2	Shipping	3	3
3.1	Project Management	5	5
3.2	Installation & Commissioning	15	15
4	Travel & Living	10	10
	Total	143	84

In addition to the General Assumptions shown above, the site-specific assumptions for Radisson includes:

- The transmitter site is currently shared by CBFRT, CH2440, CFBJ-TV and CJBTV,
- The sharing is continued with the two services being multiplexed onto one transmitter and the other two multiplexed on a second transmitter,
- The 4 HD - 2 Transmitter model is used,
- The two additional TV services in the 6 SD Model are yet to be determined

Of the four sites costed, only Gravelbourg is equal to the typical site cost in its category as outlined in Table 13. The main variable dictating the costs differences between sites is the transmitter power resulting in some costing more than the average and some less. The average used to develop the typical site costs is still valid for looking at cost comparisons and total costs for the digital upgrades.

Of the four models discussed earlier the HD& SD model, while technically feasible, was not considered practical for a sharing arrangement amongst different broadcasters. In this model, with one service in HD format and 3 others in SD format it would be difficult to achieve an agreement amongst the broadcasters as to which broadcaster would have the HD service.

The costing for the three remaining models has been applied to all 977 of the communities left behind to provide a comparison of the total digital upgrade cost differences between these three scenarios. These costs are shown in Table 20 – Total Network Digital Upgrade Costs.

Table 20 – Total Network Digital Upgrade Costs

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Current Community Status	1 Tx	2 TxS	3 TxS	4 TxS	Totals
Number of Communities	559	216	112	90	977
Costs	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)
Status Quo Model-Services Provided					
Status Quo Model-Services Provided	1-HD	2-HD	3-HD	4-HD	
Cost per Community	\$132	\$264	\$396	\$528	
Total Cost For All Communities	\$73,788	\$57,024	\$44,352	\$47,520	\$222,684
HD Multiplex Model-Services Provided					
HD Multiplex Model-Services Provided	2-HD	2-HD	2+2-HD	2+2-HD	
Cost per Community	\$156	\$156	\$290	\$290	
Total Cost For All Communities	\$87,204	\$33,696	\$32,480	\$26,100	\$179,480
SD Multiplex Model-Services Provided					
SD Multiplex Model-Services Provided	6-SD	6-SD	6-SD	6-SD	
Cost per Community	\$156	\$156	\$156	\$156	
Total Cost For All Communities	\$87,204	\$33,696	\$17,472	\$14,040	\$152,412

The costing trends in Table 20 are consistent with those already reviewed in Tables 14 and 15. The total network digital upgrade cost for all 977 communities is lower for each of the multiplexed models. In percentage terms, the HD Multiplex model is 25% less costly than the Status Quo Model and provides more services. The SD Multiplex Model is 8% less costly than the HD Multiplex Model and provides many more services. Comparing the Status Quo Model to the SD Multiplex Model the costs are 32% lower and the number of television services that can be provided is 140% higher.

New Services Model for Single Transmitter Sites

The multiplex capability discussed above and particularly the SD Multiplex Model provides an interesting opportunity for the 559 single transmitter communities. As has been shown above, a community with a single free analog OTA television service today could have 5 additional new services, owing to digital multiplexing. These services would be SD signals rather than HD signals but many communities if asked might very well prefer six free OTA signals at SD over one signal at HD.

The basic premise would be that the existing OTA broadcaster or broadcasters in the community would obviously be part to the new multiplex package. The additional services could take many forms and would probably vary by Province and Territory. The package could include public broadcasters, private broadcasters, educational broadcasters and possibly even some specialty services like news, weather and sports. In some instances, if the community was interested, one of the multiplexed signals could be a local community based service.

There are two basic models worldwide that might guide the way in thinking of the best approach to sharing of a digital multiplex. In Europe, England and Germany in particular, the digital multiplexes are shared by many different broadcasters. In the US PBS uses digital multiplexing widely and the mix of signals are all primarily in the same

corporate family. Either of these approaches or both could work in Canada: the mixed mode European approach or the American all in the family approach.

The technological capability exists for this multiple service approach, What is required is a policy framework that permits SD multiplexing, broadcasters that are interested in participating and communities that want to retain free OTA television service in the new digital era.

CBC Impact

CBC is clearly the most impacted broadcaster in the OTA digital transition no matter what plan is adopted, based on all the statistics and data shown above. A summary of CBC digital upgrade costs is shown in Table 21 –Summary of CBC Costs.

Table 21 –Summary of CBC Costs

Current Community Status	1 Tx	2 Tx	3 Tx	4 Tx	Totals
Number of Communities	309	176	92	52	629
					(Note 1)
Costs	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)
Status Quo Model-Srvcs Provided	1-HD	2-HD	3-HD	4-HD	
Cost per Community	\$132	\$264	\$396	\$528	
Total Cost For All Communities	\$40,788	\$46,464	\$36,432	\$27,456	\$162,756
HD Multiplex Model-Srvcs Provided	2-HD	2-HD	2+2-HD	2+2-HD	
Cost per Community	\$78	\$78	\$73	\$73	
Total Cost For All Communities	\$24,102	\$13,728	\$6,670	\$3,770	\$55,134
HD&SD Multiplex Model-Srvcs Provided	1-HD & 3-SD	1-HD & 3-SD	1-HD & 3-SD	1-HD & 3-SD	
Cost per Community	\$39	\$39	\$39	\$39	
Total Cost For All Communities	\$12,051	\$6,864	\$3,588	\$2,028	\$24,531
SD Multiplex Model-Srvcs Provided	6-SD	6-SD	6-SD	6-SD	
Cost per Community	\$26	\$26	\$26	\$26	
Total Cost For All Communities	\$8,034	\$4,576	\$2,392	\$1,352	\$16,354

Note 1. In Appendix A there are 88 communities shown where CBCE and CBCF share a transmitter site. The costs for these 88 transmitters are included in the totals. Once again the impact of multiplexing, new services and operating at SD versus HD would provide similar savings for CBC as those outlined above for all the services involved in these 977 communities.

In terms of overall costs for the baseline or Status Quo model the CBC is 73% of the total shown in Table 20 for all services in the 977 communities. While CBC may realize the most savings, they will still be faced with the largest proportion of the overall costs.

Implementation Strategy and Operational Savings

The implementation strategy that the costing in which this report was based could be best described as a “Hot Cut Approach”. This means the analog service would be shut down for a period of time while the appropriate analog components at the transmitter site were replaced with digital components. This is different than the transitional process that is taking place in the major markets where the television service is provided in both analog and digital simultaneously for a specified transition period leading up the analog cut-off date. The “Hot Cut Approach” was chosen as the least cost approach where only the absolute minimum amount of equipment has to be replaced and the highest level of reuse of existing facilities is achieved.

The implementation of the digital upgrades could be carried out by one or more field crews on a regional and community-by-community basis. Prior to the cut-off in any individual community, the design and implementation team would be able to indicate to the viewers in that community how long the service outage was expected to take. Earlier in this report the assumption for the service outage was in the range of hours up to several days.

Savings in ongoing operating costs are also expected based on two main criteria. First, the new digital transmitters will be lower power and more efficient thus saving on power costs relative to those same costs today. Secondly, in the multiplex models in many instances the actual number of transmitters in operation will be reduced further lowering power costs. This is significant as the transmitters are the element at these sites with the highest usage of electric power.

From another dimension in many of the multiplex models proposed above, new service could be added thus sharing the new costs and the existing operating costs amongst other parties and lowering the average operating cost per broadcaster.

Digital Transition Time Lines

The OTA digital transition is well underway worldwide. Not every country has actually started yet and none have fully completed the process yet. Some countries have mandatory analog cut-off dates while others are just letting the process run its course.

There is one transition process that is by far the most relevant to Canada and that is the one in the US. The US has a mandatory analog cut-off date of February 17, 2009. This cut-off date is applicable to full power transmitters in all major markets. Many thousands of television transmitters are either low power or repeaters and not included in this mandated cut-off. Some of these facilities are being upgraded to digital on a voluntary

basis. The FCC in due course is expected to set a cut-off date for these remaining analog transmitters.

In Canada there is a mandatory analog cut-off date of August 31, 2011. Like the US, this date is also limited to high power transmitters in major markets. There is no indication yet as to if and when a cut-off date for repeaters and low power transmitters will be established in Canada. Many of the 977 communities described in this report fall into this latter category.

Proof Of Concept Test Program

One approach to test out one or more of these multiplex models from a regulatory, broadcaster and viewer perspective would be to carry out a proof of concept pilot project in a single community. One community that would be appropriate is Kamloops. First, this location was one of the specific sites reviewed earlier in this report. Second, the community has an active organization promoting free OTA television after the loss of the local CBC service a couple years ago.

As noted earlier, the multiplex models in Kamloops could permit the CBC service to be brought back to this community as part of the pilot project. Other elements of the digital transition could also be tested out as part of this pilot project much like what will happen in Wilmington in the US. This community will have its analog cut-off this fall to assess how well the overall process will work. A similar project in Canada would bring similar benefits to all involved.

Summary and Conclusions

The OTA digital transition is underway in Canada leading up to the analog cut-off date of August 31, 2011. Many policy decisions and regulations relating to the new digital broadcasting environment in Canada have yet to be established. One policy decision that has been set is permitting only HD OTA signals without the option when warranted for multiple SD signals in a single channel.

As noted earlier SD is the standard of choice in many parts of the world and is even an option for broadcasters in the US. The cost benefits to broadcasters using the multiplex models described above and the service benefits to viewers would seem to warrant a review of the Canadian HD only OTA policy.

Sharing of digital facilities in the various multiplex models would of course be required but that is no different than the extensive sharing of transmitter facilities that currently exists. Of all the multiple transmitter sites in the 977 communities, 80% have sharing arrangements today. In these multiplex models the broadcasters would not only share digital upgrade costs but they would also share lower ongoing operating costs.

Broadcasters have expressed concerns regarding the costs associated with the digital OTA transition. The various multiplex models described in this report will reduce those

costs and share them across a broader base of television services thus providing a more viable economic approach to the digital OTA transition in Canada

With the SD multiplex model, the 559 small communities, which currently have only one free OTA television service today could have up to six OTA services in the new digital era.

Clearly the one party most affected by the digital transition in these 977 communities is the CBC. That is the case in the Status Quo model and all of the multiplex models. CBC agreement and involvement will be key to success in providing free OTA television service to the greatest number of Canadians.

One approach to test these multiplex models and all their attributes would be a proof of concept pilot project in a single community like Kamloops for instance. There is time leading up to the August 31, 2011 cut-off date to study these possibilities and find the optimum path forward to OTA digital television for both broadcasters and viewers.

Appendix A
OTA Analog TV Transmitters
Left Out of the Digital Transition
Listed by Community & by Province and Territory

References and Assumptions

All the information provided in Appendix A was taken from the Industry Canada Broadcasting Database as of February 15, 2008. This database is updated on a weekly basis and as such would be somewhat of a moving target for study and analysis purposes. For the purposes of this study the Broadcasting Database used in all of the analysis will be the February 15, 2008 version.

Assumptions:

- The communities listed in Appendix A are those expected to be left out of the digital television transition
- Only operating transmitters are shown, transmitters authorized but not yet in operation are not included
- MMDS transmitters are not included
- The television services shown in each community are identified by the codes listed in Table A below
- In some cases the Television Service listed in the Industry Canada Database does not reflect the local broadcasters current affiliation arrangement
- When a Cancom service is shown the specific nature of the service is not known
- Where sharing is identified for a community it reflects either partial or total sharing of transmitter facilities by the broadcasters in that community
- Sharing is assumed if the different television transmitters in a community have the same latitude and longitude listed in the Industry Canada Database

Table A Station Codes

Station Code	Television Service
CBCE	CBC English
CBCF	Radio-Canada (CBC French)
CTV	CTV
Global	Global
TVA	Telediffuseurs Associes
TVNC	APTN
TVO	TV Ontario
KNOW	Knowledge Network
Ind	Independent English
IndF	Independent French
TQS	TQS
R-QF	Tele-Quebec
AECC	Alberta Educational Comm. Corp
Canc	Cancom Service

Northwest Territories

Northwest Territories	TVNC	CBCE	CBCF	Other	Sharing
Whai Ti	Yes				
Wekweti	Yes				
Tsiigehtchic	Yes				
Lutselk'E	Yes				
Rae Lakes	Yes				
Fort Liard	Yes				
Pavlatuk	Yes				
Trout Lake	Yes				
Nahanni Butte	Yes				
Jean Marie River	Yes				
Holman Island	Yes				
Fort Simpson	Yes	Yes			Yes
Inuvik	Yes	Yes			Yes
Kakisa	Yes	Yes			Yes
Norman Wells	Yes	Yes			Yes
Tuktoyaktuk	Yes	Yes			Yes
Wrigley	Yes	Yes			Yes
Deline	Yes	Yes			Yes
Fort Good Hope	Yes	Yes			Yes
Rae-Edzo	Yes	Yes			Yes
Fort Resolution	Yes	Yes			Yes
Aklavik	Yes	Yes			Yes
Fort Mcpherson	Yes	Yes			Yes
Tulita	Yes			Canc	Yes
Fort Smith	Yes	Yes		Ind	
Sachs Harbor	Yes			2-Canc	Yes
Lac La Martre	Yes			5-Canc	Yes
Hay River	Yes	Yes	Yes	9-Canc	Yes
Fort Providence	Yes	Yes		9-Canc	Yes

Nunavut

Nunavut	TVNC	CBCE	CBCF	Other	Sharing
Quikiqtarjuag	Yes				
Chesterfield Inlet	Yes				
Sanikiluaq	Yes				
Coral Harbour	Yes				
Repulse Bay	Yes				
Kimmirut	Yes				
Grise Fiord	Yes				
Kuugaaruq	Yes				
Gjoa Haven	Yes	Yes			Yes
Igloolik	Yes	Yes			Yes
Pangnirtung	Yes	Yes			Yes
Cape Dorset	Yes	Yes			Yes
Taloyoak	Yes	Yes			Yes
Arviat	Yes	Yes			Yes
Baker Lake	Yes	Yes			Yes
Cambridge Bay	Yes	Yes			Yes
Pond Inlet	Yes	Yes			Yes
Rankin Inlet	Yes	Yes			Yes
Resolute	Yes	Yes			Yes
Kugluktuk	Yes	Yes			Yes
Iqaluit	Yes	Yes	Yes		Yes
Hall Beach	Yes	Yes		Canc	Yes
Artic Bay	Yes	Yes		Canc	Yes
Whale Cove	Yes	Yes		Canc	Yes
Clyde River				Ind&2-Canc	Yes
Nanisivik	Yes	Yes	Yes	5-Canc	Yes

Yukon

Yukon	TVNC	CBCE	CBCF	Other	Sharing
Burwash Landing	Yes				
Haines Junction	Yes				
Pilot Mountain	Yes				
White River		Yes			
Elsa		Yes			
Keno City/Keno	Yes	Yes			Yes
Ross River	Yes	Yes			Yes
Upper Liard	Yes	Yes			Yes
Carcross	Yes	Yes			
Dawson	Yes	Yes			Yes
Carmacks	Yes	Yes			
Destruction Bay	Yes	Yes			
Faro	Yes	Yes			
Watson Lake	Yes	Yes			
Beaver Creek	Yes	Yes			Yes
Mayo	Yes	Yes			
Old Crow	Yes	Yes			
Pelly Crossing	Yes	Yes			Yes
Tagish	Yes			Ind	
Whitehorse	Yes	Yes	Yes		Yes
Teslin	Yes	Yes		Ind	Yes
Stewart Crossing	Yes	Yes		2-Canc	Yes

Nova Scotia

Nova Scotia	CBCE	CBCF	CTV	Ind	Other	Sharing
Blue Mountain	Yes					
Whycocomagh	Yes					
Sunnybrae	Yes					
Sherbrooke	Yes					
St Andrews	Yes					
St Albans	Yes					
Springdale	Yes					
Seal Cove	Yes					
Rose Blanche	Yes					
Roddickton	Yes					
Pleasant Bay	Yes					
North East Margaree	Yes					
Middle River	Yes					
Mabou	Yes					
Lochaber	Yes					
Liverpool	Yes					
Ingonish	Yes					
Goshen	Yes					
Garden of Eden	Yes					
Country Harbour	Yes					
Aspen	Yes					
Bridgetown			Yes			
Port Hawkesbury			Yes			
Valley			Yes			
Bridgewater				Yes		
Wolfville				Yes		
Isle Madame				Yes		
Weymouth	Yes	Yes				Yes
Middelton	Yes	Yes				Yes
Digby	Yes	Yes				Yes
Caledonia	Yes		Yes			
Bay St Lawrence	Yes		Yes			
Margaree	Yes		Yes			
Inverness	Yes		Yes			
Dingwall	Yes		Yes			
Sheet Harbour	Yes		Yes			Yes
Shelbourne	Yes			Yes		
Antongish			Yes		Global	
Truro	Yes		Yes	Yes		
Mulgrave	Yes	Yes			Global	Yes
New Glasgow	Yes	Yes	Yes	Yes		Yes
Yarmouth	Yes	Yes	Yes	Yes		Yes
Cheticamp	Yes	Yes		4 Ind	18 Canc	Yes
Canning			Yes	2 Ind	13 Canc	Yes
Tracadie				Yes	16 Canc	Yes
Wallace				Yes	12 Canc	Yes
Kennetcook					9 Canc	Yes

New Brunswick & Prince Edward Island

New Brunswick	CBCE	CBCF	CTV	TVA	Other	Sharing
Florenceville			Yes			

Upsalquitch			Yes			
Blockville			Yes			
Bon Accord			Yes			
Newcastle			Yes			
Allardville		Yes				
Grand Falls		Yes				
Tracedie				Yes		
Miramichi City					Global	
Woodstock					Global	
St Andrews					Ind	
Boiestowm	Yes		Yes			Yes
Chatham	Yes		Yes			
Doaktown	Yes		Yes			
Kedgwick		Yes		Yes		Yes
ST-Guentin		Yes		Yes		Yes
Campbellton	Yes	Yes	Yes			Yes
Edmundston		Yes		Yes	TQS	Yes
PEI	CBCE	CBCF	CTV	TVA	Other	Sharing
Elmiria	Yes					
St Edward	Yes	Yes	Yes			Yes

Newfoundland

Newfoundland	CBCE	CBCF	CTV	TVNC	Sharing
Bay L'Argent	Yes				
Belleoram	Yes				
Bonne Bay	Yes				
Brent's Cove	Yes				
Buchans	Yes				
Carmanville	Yes				
Cartwright	Yes				
Coachman'S Cove	Yes				
Conche	Yes				
Fortune	Yes				
Fox Harbour	Yes				
Gambo\Middlebrook	Yes				
Gillams	Yes				
Glovertown	Yes				
Hampden	Yes				
Harbour Breton	Yes				
Harbour Le Cou	Yes				
Harbour Mille	Yes				
Harbour Round	Yes				
Hawke's Bay	Yes				
Hermitage	Yes				
Hickman's Harbour	Yes				
Irishtown	Yes				
La Scie	Yes				
Millertown	Yes				
Ming's Bight	Yes				
Mt St Margaret	Yes				
Musgrave Harbour	Yes				
Musgravetown	Yes				
North West Brook	Yes				
Pacquet	Yes				
Petty Harbour	Yes				
Placentia	Yes				
Port Aux Basques	Yes				
Port Blandford	Yes				
Port Hope Simpson	Yes				
Port Rexton	Yes				
Portland Creek	Yes				
Ramea	Yes				
Random Island	Yes				
Lamaline	Yes				
Cow Head	Yes				
Deer Lake	Yes				
Elliston	Yes				
Fermeuse	Yes				
Ferryland	Yes				

Newfoundland	CBCE	CBCF	CTV	TVNC	Sharing
Fleur De Lys	Yes				
Fogo Island	Yes				
Irishtown	Yes				
La Scie	Yes				
St Anthony	Yes				
St Bernard's	Yes				
St Jones Within	Yes				
St Lawrence	Yes				
St Mary's	Yes				
St Vincent's	Yes				
Sunnyside	Yes				
Swift Current	Yes				
Trepassey	Yes				
Trinity	Yes				
Trout River	Yes				
Wellington	Yes				
Wesleyville	Yes				
York Harbour	Yes				
Riverhead	Yes				
Lark Harbour	Yes				
Little Heart's Ease	Yes				
Lord's Cove	Yes				
Lumsden	Yes				
Argentia			Yes		
Bay Bulls			Yes		
Bonavista			Yes		
Grand Bank			Yes		
Red Rocks			Yes		
Port Au Port		Yes			
Rigolet				Yes	
Deer Lake	Yes		Yes		
Cape Broyle	Yes		Yes		Yes
Clarenville	Yes		Yes		
Grand Falls	Yes		Yes		
Stephenville	Yes		Yes		
Lawn	Yes		Yes		
Churchill Falls	Yes	Yes			Yes
Labrador City	Yes	Yes			Yes
Goose Bay	Yes			Yes	Yes
Hopedale	Yes			Yes	Yes
Nain	Yes			Yes	Yes
Postville	Yes			Yes	Yes
Makkovik	Yes			Yes	Yes
Baie Verte	2				
Marystown	2		Yes		Yes

Quebec

Quebec	CBCF	CBCE	TVA	TVNC	R-QF	TQS	Other	Sharing
Stoneham	Yes							
Temiscaming	Yes							
Tete-A-La-Baleine	Yes							
Tewkesbury	Yes							
Mont-St-Michel	Yes							
Mont-Tremblant	Yes							
Notre-Dame-Des-Monts	Yes							
Notre-Dame-Du-Laus	Yes							
Obedjiwan	Yes							
Lac-Etchemin	Yes							
Lac-Humqui	Yes							
Lac-MÚgantic	Yes							
Lebel-Sur-Quevillon	Yes							
Rapides-Des-Joachims	Yes							
Riviere-A-Claude	Yes							
Riviere-Au-Tonnerre	Yes							
Mont-Climont	Yes							
Mont-Laurier	Yes							
St-Fulgence	Yes							
St-Marc De Latour	Yes							
St-Michel-Des-Saints	Yes							
St-Pamphile	Yes							
Ste-Anne-Des-Monts	Yes							
Ville-Marie	Yes							
Weymont	Yes							
St-Fabien-De-Panet	Yes							
Ile Du Havre Aubert	Yes							
Cap-Chat	Yes							
Causapscal	Yes							
Chapais	Yes							
Clermont	Yes							
Gethsemani	Yes							
Grande-Vallee	Yes							
Gros-Morne	Yes							
Joutel	Yes							
Les Mechins	Yes							
Longue-Pointe-De-Min	Yes							
Manouane	Yes							
Marsoui	Yes							
Matagami	Yes							
Matane	Yes							
Havre-St-Pierre	Yes							
Aguanish	Yes							
Bearn/Fabre	Yes							

Quebec	CBCF	CBCE	TVA	TVNC	R-QF	TQS	Other	Sharing
Beauceville	Yes							
Baie-Johan-Beetz	Yes							
Ste-Famille	Yes							
New-Carlisle		Yes						
New-Richmond		Yes						
Wakeham		Yes						
Escuminac		Yes						
Malartic		Yes						
Maniwaki		Yes						
Alma		Yes						
Roberval			Yes					
Ste-Marguerite-Marie			Yes					
Escuminac			Yes					
Tasiujaq				Yes				
Ivujivik				Yes				
Quaqtaq				Yes				
Umiujaq				Yes				
Kangiqsujuaq				Yes				
Kangirsuk				Yes				
Akulivik				Yes				
Aupaluk				Yes				
Gascons					Yes			
Grand-Fonds					Yes			
Baie-Trinite					Yes			
GaspÚ						Yes		
Forestville							IndF	
Great Whale River							IndE	
Chisasibi	Yes	Yes						Yes
Theftford-Mines	Yes	Yes						Yes
Iles-De-La-Madeleine	Yes	Yes						Yes
Murdochville	Yes	Yes						Yes
Mistassini/Mistassini(lr)	Yes	Yes						Yes
Old Fort Bay	Yes	Yes						Yes
Riviere-St-Paul	Yes	Yes						Yes
Schefferville	Yes	Yes						Yes
Waswanipi	Yes	Yes						Yes
St-Augustin	Yes	Yes						Yes
Blanc-Sablon	Yes	Yes						Yes
Chibougamau	Yes	Yes						Yes
La Tabatiere	Yes	Yes						Yes
La Tuque	Yes	Yes						Yes
Harrington-Harbour	Yes	Yes						Yes
Waskaganish	Yes	Yes						Yes
Riviere-Au-Renard	Yes		Yes					Yes

Quebec	CBCF	CBCE	TVA	TVNC	R-QF	TQS	Other	Sharing
St Urbain	Yes		Yes					Yes
Cloridorme	Yes		Yes					Yes
L'Anse A Valleau	Yes		Yes					Yes
Chapeau	Yes				Yes			Yes
Jonquiere	Yes						IndF	
Les Escoumins						Yes	IndF	Yes
Inukjuak	Yes	Yes		Yes				Yes
Salluit	Yes	Yes		Yes				Yes
Povungnituk	Yes	Yes		Yes				Yes
Kuujuarapik	Yes	Yes	Yes					Yes
Port-Daniel	Yes	Yes	Yes					Yes
Chandler	Yes	Yes					IndF	Yes
Fermont	Yes	Yes					IndF	Yes
Baie-Comeau	Yes	Yes				Yes		Yes
Cabano	Yes		Yes			Yes		Yes
Baie St-Paul	Yes		Yes			Yes		Yes
Parent	Yes					Yes	Canc	Yes
Chicoutimi			Yes		Yes		IndF	
Hull			Yes		Yes		Ind	Yes
Kangiqsualujuaq				Yes			2-Canc	Yes
Val-d'Or	Yes		Yes		Yes	Yes		Yes
Carleton	Yes		Yes		Yes	Yes		Yes
Perce	Yes	Yes	Yes					Yes
Gaspe	Yes	Yes	Yes					Yes
Rimouski	Yes		Yes		Yes	Yes		Yes
Sept-Iles	Yes	Yes	Yes		Yes		IndF	Yes
Radisson	Yes				Yes	Yes	IndF & Canc	Yes
Kuujuuaq	Yes	Yes		Yes			5-Canc	Yes
Wemindji	2	Yes					CTV & 7-Canc	Yes
Trois-Pistoles	Yes		Yes			Yes	15-Canc	Yes

Ontario

Ontario	CBCE	TVO	CBCF	CTV	Global	Other	Sharing
Maynooth	Yes						
Smiths Falls	Yes						
Prescott	Yes						
White River	Yes						
Hornepayne	Yes						
Marathon	Yes						
Normandale	Yes						
Oshawa	Yes						
Osnaburgh	Yes						
Brighton	Yes						
Barry's Bay	Yes						
Foymount	Yes						
Fraserdale	Yes						
Atikokan	Yes						
Lac La Croix		Yes					
Upsala		Yes					
Val Cote		Yes					
Vermilion Bay		Yes					
Virginiatown		Yes					
Pic-Mobert		Yes					
Pinewood		Yes					
Matachewan		Yes					
Mattice		Yes					
Michipicoten River		Yes					
Rainy River		Yes					
Rat Portage		Yes					
Redditt		Yes					
Richards Landing		Yes					
RosSPORT		Yes					
Ryland		Yes					
Sabaskong Bay LR		Yes					
Searchmont		Yes					
Seine River		Yes					
Northwest Angle LR 3		Yes					
Ogoki		Yes					
South Gillies		Yes					
Spring Bay		Yes					
Stratton		Yes					
Tehkummah		Yes					
Temagami North		Yes					
Thessalon		Yes					
Thornloe		Yes					
Tobermory		Yes					
Shakespeare Township		Yes					

Ontario	CBCE	TVO	CBCF	CTV	Global	Other	Sharing
Prince Township		Yes					
Providence Bay		Yes					
Quibell		Yes					
Walford		Yes					
Warren		Yes					
Watten		Yes					
Webequie		Yes					
West Bay		Yes					
Whitefish Bay		Yes					
Whitefish Falls		Yes					
Wikwemikong		Yes					
Wild Goose		Yes					
Wunnummin Lake		Yes					
Shebandowan		Yes					
Shoal Lake		Yes					
Silver Water		Yes					
Gore Bay		Yes					
Goulais River		Yes					
Gowganda		Yes					
Grassy Narrows		Yes					
Gull Bay		Yes					
Emo		Yes					
Hallam		Yes					
Charlton		Yes					
Cloyne		Yes					
Coleman Township		Yes					
Collins		Yes					
Heron Bay		Yes					
Hilliardton		Yes					
Hilton Beach		Yes					
Hudson		Yes					
Hudson Township		Yes					
Iron Bridge		Yes					
Jellicoe		Yes					
Jogues		Yes					
Kagawong		Yes					
Karalash Corners		Yes					
Kasabonika		Yes					
Kashabowie		Yes					
Keewaywin		Yes					
Kenabeek		Yes					
Hallebourg		Yes					
Kenogami		Yes					
Englehart		Yes					
Eton-Rugby		Yes					

Ontario	CBCE	TVO	CBCF	CTV	Global	Other	Sharing
Eva Lake		Yes					
Evanturel Townsh		Yes					
Kitigan		Yes					
Lake Helen		Yes					
Larder Lake		Yes					
Latchford		Yes					
Lee Valley		Yes					
Macdiarmid		Yes					
Mackenzie		Yes					
Madawaska		Yes					
Manitowaning		Yes					
Marten Falls		Yes					
Hanbury		Yes					
Harty		Yes					
Minaki		Yes					
Mindemoya		Yes					
Mine Centre		Yes					
Missanabie		Yes					
Moonbeam		Yes					
Morson		Yes					
Nairn		Yes					
New Osnaburg		Yes					
Nestor Falls		Yes					
North Branch		Yes					
Massey		Yes					
Kerns Township		Yes					
Killarney		Yes					
King Kirkland		Yes					
Opasatika		Yes					
Oxdrift		Yes					
Pearl		Yes					
Peawanuck		Yes					
Alberton		Yes					
Aroland		Yes					
Belle Vallee		Yes					
Bergland		Yes					
Birch Island		Yes					
Britt		Yes					
Bruce Mines		Yes					
Caramat		Yes					
Cartier		Yes					
Constance Lake		Yes					
Coppell		Yes					
Dack Township		Yes					
Desbarats		Yes					

Ontario	CBCE	TVO	CBCF	CTV	Global	Other	Sharing
Devlin		Yes					
Dobie		Yes					
Dorion		Yes					
Dymond Township		Yes					
Eagle Lake LR 27		Yes					
Eagle River		Yes					
Earlton		Yes					
Elk Lake		Yes					
Barclay		Yes					
Barclay Township		Yes					
Barwick		Yes					
Batchawana Bay		Yes					
Bearskin Lake		Yes					
Fauquier		Yes					
Foleyet		Yes					
Chamberlain Township		Yes					
Laird Township		Yes					
Fort Severn		Yes					
Mattawa			Yes				
Sturgeon Falls			Yes				
Espanola			Yes				
Dubreuilville			Yes				
Orillia				Yes			
Cornwall				Yes			
Deseronto				Yes			
Midland					Yes		
Stevenson					Yes		
Paris					Yes		
Fort Erie					Yes		
Wheatley						Ind	
Woodstock						Ind	
Leamington						Ind	
Muskoka						Ind	
Cat Lake	Yes	Yes					Yes
Pickle Lake	Yes	Yes					
Red Lake	Yes	Yes					
Mcarthur'S Mills	Yes	Yes					Yes
Savant Lake	Yes	Yes					Yes
Sioux Narrows	Yes	Yes					
Temagami	Yes	Yes					
Whitney	Yes	Yes					
Sioux Lookout	Yes	Yes					
Ignace	Yes	Yes					
Little Current	Yes	Yes					

Ontario	CBCE	TVO	CBCF	CTV	Global	Other	Sharing
Moosonee	Yes	Yes					
Armstrong	Yes	Yes					
Beardmore	Yes	Yes					
Geraldton	Yes		Yes				Yes
Dryden	Yes		Yes				Yes
Barrie	Yes		Yes				Yes
Fort Frances	Yes		Yes				
Manitowadge	Yes		Yes				Yes
Sarnia	Yes			Yes			
Warton	Yes			Yes			
Kearns	Yes			Yes			
Bancroft	Yes				Yes		
Wingham	2						
Belleville		Yes	Yes				Yes
Penetanguishene		Yes	Yes				Yes
Gogama		Yes	Yes				
Owen Sound		Yes			Yes		
Val Rita		2					Yes
Wabigoon		2					Yes
Pointe Au Baril		2					Yes
Poplar Hill		2					Yes
Sachigo Lake		2					Yes
Savard		2					Yes
Rainy Lake Ind R		2					Yes
Kashechewan		2					Yes
Kejick Bay		2					Yes
Evansville		2					Yes
Evanturel		2					Yes
Lansdowne House		2					Yes
Hawkesbury		2					Yes
Muskrat Dam		2					Yes
New Osnaburgh		2					Yes
Kingfisher Lake		2					Yes
Pays Plat		2					Yes
Angling Lake		2					Yes
Weagamow		2					Yes
Wharncliffe		2					Yes
Pikangikum	Yes	2					Yes
North Spirit Lake	Yes	2					Yes
Sandy Lake	Yes	2					Yes
Slate Falls	Yes	2					Yes
Attawapiskat	Yes	2					Yes
Big Trout Lake	Yes	2					Yes
Deer Lake	Yes	2					Yes

Ontario	CBCE	TVO	CBCF	CTV	Global	Other	Sharing
Fort Albany	Yes	2					Yes
Fort Hope	Yes	2					Yes
Oba		3					Yes
Kaboni		3					Yes
Lac-Ste-Therese		3					Yes
Longlac		3					Yes
Harris Township		3					Yes
Hawk Junction		3					Yes
Kirby's Corner		3					Yes
Brethour		3					Yes
Sultan		3					Yes
Wawa	Yes		Yes	Yes			Yes
Chapleau	Yes		Yes	Yes			Yes
Kapuskasing	Yes		Yes	Yes			Yes
Hearst	Yes		Yes	Yes			Yes
Elliot Lake	Yes		Yes	Yes			
Chatham	Yes	Yes	Yes				Yes
Nipigon	Yes	Yes	Yes				Yes
Huntsville	Yes	Yes		Yes			Yes
Parry Sound	Yes	Yes				Ind	Yes
Summer Beaver	Yes	3					Yes
Kitchener	Yes	Yes	Yes	Yes			Yes
Kenora	Yes	Yes	Yes	Yes			Yes
Nakina		Yes				3-Canc	Yes
Pembroke	Yes	2		2			Yes
North Bay	Yes	Yes		Yes	Yes	Ind	Yes
Sault Ste Marie	Yes	Yes	Yes	Yes	Yes	Ind	Yes
Timmins	Yes	Yes	Yes	Yes	Yes	Ind	Yes
Sudbury	Yes	Yes	Yes		Yes	Ind	Yes
Ear Falls	Yes	Yes				5-Canc	Yes
Monteith	Yes	2				Ind &10-Canc	Yes

Manitoba

Manitoba	CBCE	CBCF	CTV	Other	Sharing
Churchill	Yes				
Cormorant	Yes				
Cross Lake	Yes				
Easterville	Yes				
Fairford	Yes				
Foxwarren	Yes				
Gillam	Yes				
Gods Lake Narrow	Yes				
Grand Rapids	Yes				
Jackhead	Yes				
Mafeking	Yes				
Manigotagan	Yes				
Mccusker Lake	Yes				
Melita	Yes				
Moose Lake	Yes				
Nelson House	Yes				
Norway House	Yes				
Oxford House	Yes				
Pikwitonei	Yes				
Piney	Yes				
Poplar River	Yes				
Pukatawagan	Yes				
Brochet	Yes				
Thicket Portage	Yes				
Waasagomach	Yes				
Leaf Rapids	Yes				
Lynn Lake	Yes				
Shamattawa	Yes				
Sherridon	Yes				
South Indian Lake	Yes				
Oak Lake		Yes			
Pine Falls		Yes			
St-Lazare		Yes			
Ste Rose Du Lac		Yes			
Fraserwood				Canc	
Minnedosa				Ind	
Portage La Prairie				Ind	
Dauphin	Yes		Yes		Yes
Fisher Branch	Yes		Yes		Yes
Mccreary	Yes		Yes		Yes
Snow Lake	Yes		Yes		Yes
Flin Flon	Yes	Yes	Yes		Yes

Manitoba	CBCE	CBCF	CTV	Other	Sharing
The Pas	Yes	Yes	Yes		Yes
Thompson	Yes	Yes	Yes		Yes
Wabowden	Yes	Yes		Canc & Ind	Yes
Spruce Sands				5-Canc	Yes

Saskatchewan

Saskatchewan					
Saskatchewan	CBCE	CBCF	CTV	Other	Sharing
Warmley	Yes				
Cumberland House	Yes				
Cypress Hills	Yes				
Fond Du Lac	Yes				
Island Falls	Yes				
Maple Creek	Yes				
La Ronge	Yes				
Montreal Lake	Yes				
Buffalo Narrows	Yes				
Riverhurst	Yes				
Southend	Yes				
Spiritwood	Yes				
Stanley Mission	Yes				
Stony Rapids	Yes				
Tisdale	Yes				
Greenwater Lake	Yes				
Ile-A-La-Crosse	Yes				
Palmbere Lake	Yes				
Patuanak	Yes				
Pelican Narrows	Yes				
Pinehouse Lake	Yes				
Debden		Yes			
Bellegarde		Yes			
St Brieux		Yes			
Zenon Park		Yes			
Alcot Trail			Yes		
Carlyle Lake			Yes		
Colgate			Yes		
Eastend			Yes		
Alticane			Yes		
Melfort			Yes		
Humboldt			Yes		
Golden Prairie			Yes		
Leoville	Yes	Yes			
Gravelbourg	Yes	Yes			Yes
Ponteix	Yes	Yes			Yes
Nipawin	Yes		Yes		Yes
Norquay	Yes		Yes		Yes
Big River	Yes		Yes		Yes
Shaunavon	Yes		Yes		
Stranraer	Yes		Yes		
Swift Current	Yes		Yes		
Tantallon	Yes		Yes		Yes
Hudson Bay	Yes		Yes		Yes

Saskatchewan	CBCE	CBCF	CTV	Other	Sharing
Wynyard	Yes		Yes		Yes
Meadow Lake	Yes		Yes		
Jans Bay				2-Canc	Yes
Regina Beach				2-Canc	Yes
Willow Bunch	Yes	Yes	Yes		Yes
Moose Jaw	Yes	Yes	Yes		
North Battleford	Yes	Yes	Yes		Yes
Prince Albert	Yes	Yes	Yes		Yes
Fort Qu'Appelle	Yes		Yes	Ind	Yes
Elrose	2		Yes		Yes
La Loche	Yes	Yes		2-Canc	Yes
Beauval	Yes			3-Canc	Yes
Onion Lake				4-Canc	Yes
Green Lake				4-Canc	Yes
Wollaston Lake	Yes			5-Canc	Yes
Uranium City				6-Canc	Yes
Yorkton	Yes		Yes	15-Canc	Yes

Alberta

Alberta	CBCE	CBCF	CTV	Other	Sharing
Pivot	Yes				
Rainbow Lake	Yes				
Rosemary	Yes				
Harvie Heights	Yes				
Jean D'Or	Yes				
Coutts/Milkriver	Yes				
Cowley	Yes				
Daysland	Yes				
Etzikom	Yes				
Forestburg	Yes				
Fort Chipewyan	Yes				
Fort Vermilion	Yes				
Fox Creek	Yes				
Fox Lake	Yes				
Bellevue	Yes				
Chateh	Yes				
Manning	Yes				
Paddle Prairie	Yes				
Wabasca	Yes				
Coronation	Yes				
Beaverlodge	Yes				
Falher		Yes			
Pigeon Mountain			Yes		
Rocky Mountain House			Yes		
Grouard Mission			Yes		
Ashmont			Yes		
Canmore			Yes		
Lougheed			Yes		
Bow Island				Ind	
Plamondon\Lac Labich	Yes	Yes			
Hinton	Yes	Yes			Yes
Fort McMurray	Yes	Yes			Yes
Provost	Yes		Yes		Yes
Slave Lake	Yes		Yes		Yes
Lac La Biche	Yes		Yes		
Athabasca	Yes		Yes		
Oyen	Yes		Yes		
Wainwright	Yes		Yes		Yes
Whitecourt	Yes		Yes		Yes
Cardston	Yes			Ind	
Loon Lake	Yes			Canc	Yes
Brooks			Yes	Ind	Yes
Bassano			2		Yes
Assumption				TVNC & AECC	Yes

Alberta	CBCE	CBCF	CTV	Other	Sharing
Bushe River				TVNC & AECC	Yes
Meander River				TVNC & AECC	Yes
Grande Prairie	Yes	Yes	Yes		
Bonnyville	Yes	Yes	Yes		Yes
Peace River	Yes	Yes	Yes		Yes
Waterton Park	Yes		Yes	Ind	Yes
Banff	Yes		Yes	Ind	Yes
East Coulee	Yes		Yes	Ind	Yes
Coleman	Yes		Yes	Ind	
Jasper	2		Yes		
Pincher Creek	2		Yes		Yes
High Level	Yes			2-Canc	Yes
Exshaw	2		Yes	Ind	Yes
Burmis	Yes		Yes	2-Ind	Yes
Sputinow			Yes	3-Canc	Yes
Wanham				4-Canc	Yes
Red Deer	Yes	Yes	Yes	2-Ind	Yes
Drumheller	2		2	Ind	
Lethbridge	Yes	Yes	Yes	3-Ind	Yes
High Prairie	Yes			5-Canc	Yes
Lake Louise	Yes		Yes	Ind & 7-Canc	Yes

British Columbia

British Columbia	CBCE	CTV	KNOW	Global	CBCF	Other	Sharing
Hudson Hope	Yes						
Braeloch	Yes						
Bullhead Mountain	Yes						
Woss Camp	Yes						
Yale	Yes						
Vanderhoof	Yes						
Tete Jaune	Yes						
Radium Hot Springs	Yes						
Redstone Flat	Yes						
Tahsis	Yes						
Taylor	Yes						
Squamish/Bracken	Yes						
Spillimacheen	Yes						
Sayward	Yes						
Sechelt	Yes						
Salmo	Yes						
Rock Creek	Yes						
Ruby Creek	Yes						
Merritt	Yes						
Midway	Yes						
Purden Lake	Yes						
Prince Rupert	Yes						
Princeton	Yes						
Port Alice	Yes						
Port Hardy	Yes						
Port Mcneill	Yes						
Phoenix	Yes						
Nicola	Yes						
Mount Mcdonald	Yes						
Moricetown	Yes						
Gold River	Yes						
Golden	Yes						
Greenwood	Yes						
Madeira Park	Yes						
Hope	Yes						
Harrison Hot Spring	Yes						
Crawford Bay	Yes						
Brisco	Yes						
Fruitvale	Yes						
Fort St John	Yes						
Fort Nelson	Yes						
Field	Yes						
Erie	Yes						
Donald	Yes						

British Columbia	CBCE	CTV	KNOW	Global	CBCF	Other	Sharing
Coal Harbour	Yes						
Canal Flats	Yes						
Bella Bella	Yes						
Bella Coola	Yes						
Bonnington Falls	Yes						
Alert Bay	Yes						
Taghum		Yes					
Santa Rosa		Yes					
River Jordan		Yes					
Priestly		Yes					
Oliver / Osoyoos		Yes					
Mount Goldie		Yes					
Tulameen			Yes				
Winfield			Yes				
Summit Lake			Yes				
Sicamous			Yes				
Silver Creek			Yes				
Sinclair Mills			Yes				
Miocene			Yes				
Port Renfrew			Yes				
Kitchener			Yes				
Nemaiah Valley			Yes				
Galiano			Yes				
Fairmont Hot Springs			Yes				
Columbia Lake			Yes				
Cortes Island			Yes				
Cardiff Mountain			Yes				
Becher Bay			Yes				
Bald Mountain			Yes				
Arras			Yes				
Lone Butte			Yes				
Kildonan			Yes				
Wilson Creek				Yes			
Celista				Yes			
Canoe				Yes			
Brackendale				Yes			
Kitimat					Yes		
Abbotsford						Ind	
Fraser Valley						Ind	
Sooke	Yes	Yes					Yes
Williams Lake	Yes	Yes					Yes
Sparwood	Yes	Yes					
Rimrock	Yes	Yes					Yes
Pritchard	Yes	Yes					Yes

British Columbia	CBCE	CTV	KNOW	Global	CBCF	Other	Sharing
Port Alberni	Yes	Yes					
Nelson	Yes	Yes					
Nakusp	Yes	Yes					Yes
Mabel Lake	Yes	Yes					Yes
Mackenzie	Yes	Yes					
Creston	Yes	Yes					
Invermere	Yes	Yes					Yes
Campbell River	Yes	Yes					
Allison Creek	Yes	Yes					Yes
Cranbrook	Yes	Yes					Yes
Chase	Yes	Yes					
Castlegar	Yes	Yes					
Bowen Island	Yes	Yes					
Atlin	Yes	Yes					Yes
Quilchena	Yes	Yes					Yes
Tofino	Yes		Yes				Yes
Pouce Coupe	Yes		Yes				
Hixon	Yes		Yes				
Christina Lake	Yes		Yes				
Canim Lake	Yes		Yes				Yes
Green Lake	Yes		Yes				
Squamish	Yes			Yes			Yes
Oliver	Yes			Yes			
Hazelton	2						Yes
Revelstoke	2						
Wells	Yes					Canc	Yes
Dease Lake	Yes					Canc	Yes
North Pine		Yes	Yes				Yes
Moberly Lake		Yes	Yes				Yes
Cedar Hill		Yes	Yes				Yes
Salmon Arm		Yes		Yes			
Apex Mountain		Yes		Yes			Yes
Telkwa			Yes			Canc	Yes
Topley			Yes			Ind	Yes
Tumbler Ridge						2-Canc	Yes
Tuktakamin Mountain	Yes	Yes	Yes				Yes
Smithers	Yes	Yes	Yes				Yes
Vavenby	Yes	Yes	Yes				Yes
Ucluelet	Yes	Yes	Yes				
Ootsa Lake	Yes	Yes	Yes				Yes
Savona	Yes	Yes	Yes				Yes
Peachland	Yes	Yes	Yes				Yes
Pavilion Lake	Yes	Yes	Yes				Yes
Moyie	Yes	Yes	Yes				Yes

British Columbia	CBCE	CTV	KNOW	Global	CBCF	Other	Sharing
Grand Forks	Yes	Yes	Yes				Yes
Mcclure	Yes	Yes	Yes				Yes
Malakwa	Yes	Yes	Yes				Yes
Lytton	Yes	Yes	Yes				Yes
Kamloops	Yes	Yes	Yes				Yes
Houston	Yes	Yes	Yes				Yes
Anahim Lake	Yes	Yes	Yes				Yes
Coalmont	Yes	Yes	Yes				Yes
Clearwater	Yes	Yes	Yes				Yes
Cherryville	Yes	Yes	Yes				Yes
Alexis Creek	Yes	Yes	Yes				Yes
Barriere	Yes	Yes	Yes				Yes
Nitinaht Lake	Yes	Yes	Yes				Yes
North Lillooet	Yes	Yes	Yes				Yes
Little Fort	Yes	Yes	Yes				Yes
Vernon	Yes	Yes		Yes			Yes
Quesnel	Yes	Yes				Ind	Yes
Toosey Indian Reserv	Yes	Yes				Ind	Yes
Courtenay	Yes			Yes		Ind	Yes
Trail	2	Yes					Yes
Fernie	2	Yes					Yes
Coldwater I R #1	Yes					2-Canc	Yes
Canyon Creek		Yes	Yes			Ind	
Lumby		Yes		Yes		Ind	Yes
Shakan Indian Reserv		Yes				2-Ind	Yes
Fraser Lake		Yes				2-Canc	Yes
Blaeberry			Yes			2-Canc	Yes
Campbell Road			Yes			2-Canc	
Whistler	Yes	Yes		Yes		Ind	Yes
Penticton	Yes	Yes		2			Yes
Kelowna	Yes	Yes		Yes	Yes		Yes
Cache Creek	Yes	Yes		Yes		Ind	Yes
Burton	Yes	Yes		Yes		AECC	Yes
Enderby	Yes	Yes	Yes	Yes			Yes
Ashcroft	Yes	Yes	Yes			Ind	Yes
100 Mile House	Yes	Yes	2				
Parson	Yes		Yes			2-Canc	Yes
Fort Fraser	Yes		Yes			2-Canc	Yes
Clinton	2	Yes	Yes				Yes
Chilliwack	2			Yes	Yes		Yes
Loon Lake	2	Yes	Yes				Yes
Kitwanga			Yes			3-Canc	Yes
Donald Station			2			2-Canc	Yes
Fort Babine						4-Canc	Yes

British Columbia	CBCE	CTV	KNOW	Global	CBCF	Other	Sharing
Slocan	Yes	Yes	Yes			2-Canc	Yes
Winlaw	Yes		Yes			3-Canc	Yes
Pemberton	Yes	2	2				Yes
Crescent Valley	Yes		Yes			3-Canc	Yes
Bralorne	Yes		Yes			3-Canc	Yes
Keremeos/Olalla	2	Yes	2				Yes
Lillooet/Riley Creek	Yes	Yes	Yes	Yes		2-Canc	Yes
Passmore	Yes		Yes			4-Canc	Yes
Hagensborg	Yes	Yes	Yes			3-Canc	Yes
Burns Lake	Yes	Yes	2			2-Canc	Yes
Blue River	Yes		Yes			4-Canc	Yes
Bamfield	Yes		Yes			4-Canc	Yes
Avola	Yes					5-canc	Yes
Seton Portage	Yes		Yes			5-canc	Yes
New Denver	Yes					6-Ind	Yes
Valemount	Yes		Yes			Ind & 5-Canc	Yes
Spences Bridge	Yes	Yes				6-Canc	Yes
Hasler Flats			2			6-Canc	Yes
Chetwynd	Yes		Yes			7-Canc	Yes
Mcbride	Yes		Yes			Ind & 6-Canc	Yes
Granisle	Yes		Yes			10-Canc	Yes
Lillooet	Yes	Yes			Yes	12-Canc	Yes
Logan Lake	2		Yes		Yes	18-Canc	Yes