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THE PUBLIC MEDIA ACCESS PUZZLE SIEVE (PUBLIC M.A.P.S.) MODEL

AN EDITED EXCERPT FROM STEVEN JAMES MAY'S
2017 DISSERTATION ENTITLED

THE END(S) OF ANALOGUE: ACCESS TO CBC/RADIO-CANADA TELEVISION PROGRAMMING IN AN ERA OF DIGITAL DELIVERY

SUBMITTED JANUARY 10, 2019 IN RESPONSE TO THEME "A" OF CANADA'S BROADCASTING AND TELECOMMUNICATIONS LEGISLATIVE REVIEW (BTLR),

"REDUCING BARRIERS TO ACCESS BY ALL CANADIANS TO ADVANCED TELECOMMUNICATIONS NETWORKS", WITH SPECIFIC INSIGHT INTO THE FOLLOWING ITEMS OF INTEREST:

1. UNIVERSAL ACCESS AND DEPLOYMENT

6. EFFECTIVE SPECTRUM REGULATION

9. BROADCASTING POLICY OBJECTIVES

13. NATIONAL PUBLIC BROADCASTER

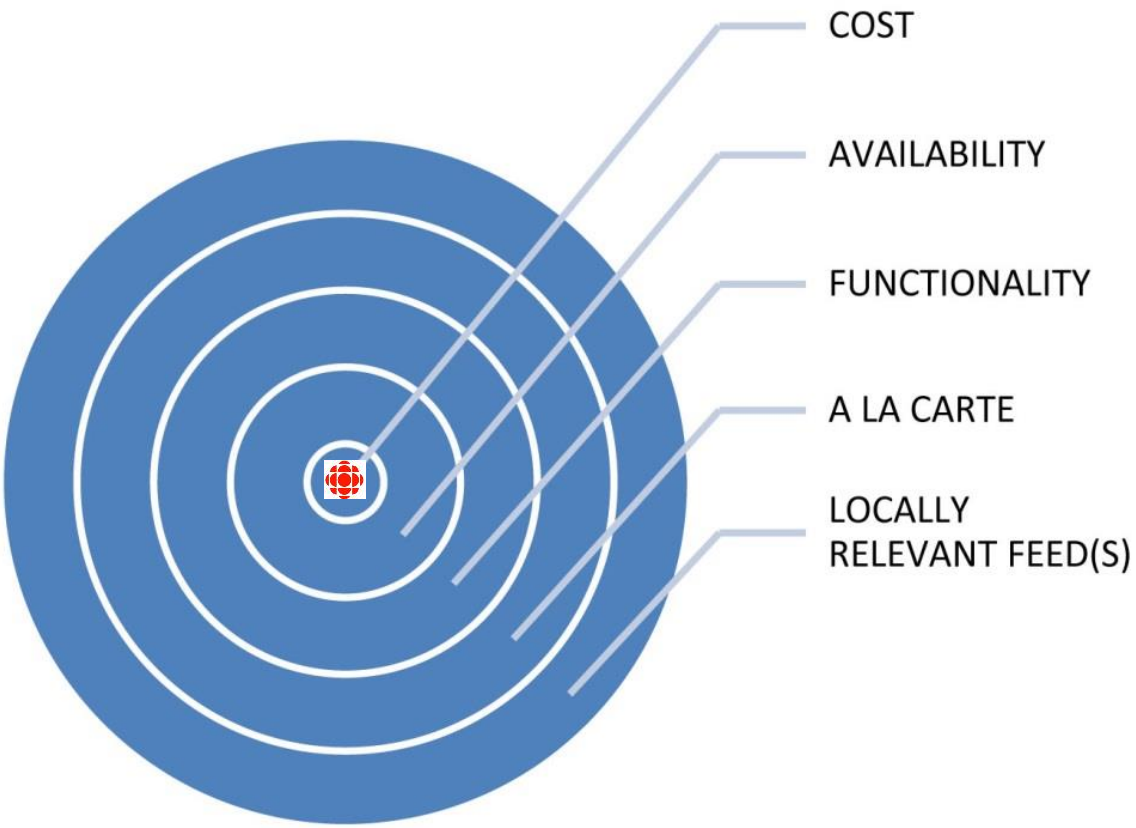
Universal Access to the National Public Broadcaster

CBC/Radio-Canada's shift from analogue public service broadcasting (PSB) to digital public service media (PSM) has entailed a precarious reorganization of the provision of public television delivery in Canada. CBC/Radio-Canada's complete transfer of the provision of access to its television programming to Canadian BDUs (Broadcasting Distribution Undertakings), ISPs (Internet Service Providers), and/or mobile wireless providers in areas of the country outside of the television markets where CBC/Radio-Canada opted to install digital over-the-air (OTA) television transmitters by 2012 made the achievement of post-analogue access to its television programming more challenging for some Canadian households. This submission to the BTLR details the findings of a Ph.D. dissertation examining the difficulties reported by households with regards to the achievement of digital access to CBC/Radio-Canada television and argues that, even in the digitally divine (Mosco, 2004) age, television programming does not deliver itself.

Drawing from research interviews conducted with 99 analogue over-the-air (OTA) CBC/Radio-Canada television-viewing Canadian households that lost OTA access to one or more CBC/Radio-Canada television stations between 2011 and 2012, and five members of CBC/Radio-Canada Management involved with the public broadcaster's 2012 response to Canada's 2011 digital television transition, the dissertation research presented here asks whether CBC/Radio-Canada's operational response to Canada's digital television transition has enhanced the universality of access to its television programming in the digital age. The dissertation research presented here contributes to the political economy of communication (PEC) by questioning the aims of Canada's regulated broadcast and telecommunications systems with respect to the provision of digital access to public service media (PSM) in the country. The illumination of post-analogue barriers to public television access by the multi-layered Public

Media Access Puzzle Sieve (Public M.A.P.S.) model articulated by the dissertation presented here assists in both anticipating future, and identifying existing, barriers to access to public service media (PSM) such as CBC/Radio-Canada television programming.

Figure 1. Public M.A.P.S. model



As illustrated in Figure 1, the Public Media Access Puzzle Sieve (Public M.A.P.S.) model depicts the access layers that each household that is striving to access CBC/Radio-Canada television programming must navigate in order engage with the programming. The layers are best described as sieves since the specific design of a sieve determines what may or may not pass through it to the other side.

Buried within the core of the Public M.A.P.S. model is the public service media that households are striving to access and that public service broadcasters are striving to make

universally accessible (as depicted by the CBC/Radio-Canada logo located in the centre of Figure 1). When television programming is no longer distributed directly by a public service media outlet, universal access to such programming is either eroded or cut off completely. A household only gains full access to the PSM, defined by the five layers of the Public M.A.P.S. model, once all five layers of the puzzle sieve have been permeated. If a household is unable to pass through one or more layers of the puzzle sieve, full access to PSM is not achieved.

The first barrier to accessing public service media is cost, as shown by the inner-most layer of the Public M.A.P.S. model. For those households where the cost(s) to achieve access to PSM is not an issue, such households are able to pass directly through the cost layer by paying for whatever television delivery service(s) will provide such PSM access to the household. This might mean subscribing to a paid television service in order to gain access to programming, or subscribing to a paid internet service provider for a connection capable of sustaining a steady connection to a video stream over the internet. For a household where cost is not an issue, such a household could (for example), pay for their own personal fibre optic line to be run to the household if necessary such that access to PSM over the internet might be achieved. Such households would then able to engage directly with the PSM and the household would have access. For households where cost is an issue however, such that the cost(s) to be incurred by a household to achieve such access to PSM is prohibitive and as such a household is unable to pass through the first Cost sieve layer, the remaining four sieve layers of the Public M.A.P.S. model must be tackled by the household if access is to be achieved starting with the Availability sieve layer. In other words, if a household can't pass through the Cost sieve layer, the other sieve layers must be attempted by the household. Otherwise, household access to PSM is not achievable.

The Availability sieve layer relates to the existing television delivery services that are available to a particular household. For example, if a particular household is located within the coverage area of a digital OTA television transmitter then the household might be able to receive a signal from the public broadcaster provided that the household has the hardware required to access such a broadcast television signal and if the local terrain does not interfere with signal availability. Alternatively, if a local cable or IPTV provider serves the area where a household is located then a wired connection may be available to the household and could provide PSM access. In terms of the PSM access by way of the internet, the Availability sieve layer includes whether or not the PSM content/experiences that a household is seeking is offered online. If other points of access to PSM are available, such as direct-to-home (DTH) satellite and/or fixed or mobile wireless service, such points of access would provide additional means by which to pass through the Availability sieve layer.

Once passing through the Availability sieve layer, the next sieve that the household must tackle is the Functionality sieve layer. For households where none of the above-listed points of access to PSM are available then the household does not pass through the Availability sieve layer and PSM access is not achieved. The Functionality sieve layer pertains to the audio-visual quality of PSM feed(s) that might be available to a household. In other words, the Functionality sieve layer relates to how well a household is able to maintain a connection to the PSM that is being sought out. For example, if a household is accessing PSM by way of a BDU, fixed or mobile wireless networks, or via digital OTA, the Functionality layer relates to whether or not the television signal cuts out during poor weather (referred to as rain fade), whether the signal is HD or SD, and whether the signal suffers from buffering. Additional aspects of the Functionality sieve layer includes whether or not a feed to PSM includes Closed Captioning

and/or Descriptive Video. If the audio-visual quality of the PSM feed is insufficient to allow viewing then the Functionality sieve layer is not penetrated and access does not occur.

For households that are able to successfully pass through the Functionality sieve layer, the household must next solve the A La Carte sieve layer. The A La Carte sieve layer relates to whether or not a PSM feed can be accessed by a household without any requirement to also engage with other intermediary or bundled services. For example, if a household is required to accept other services unrelated to PSM delivery in the form of a bundle package and/or is required to first enter into a contract or rental agreement in order to gain access to the PSM then the A La Carte sieve layer maintains a barrier to PSM access.

Lastly, if a household seeking PSM access successfully passes through the Availability, Functionality, and A La Carte sieve layers, the remaining puzzle sieve layer is the Locally Relevant Feed(s) sieve layer. The Locally Relevant Feed(s) sieve layer deals with how locally relevant a PSM feed is to a household. For example, if a household located in Newfoundland and Labrador is only able to access PSM media originating from Nova Scotia, or if a household in Québec is only able to access PSM from Ontario, in both scenarios the Locally Relevant Feed(s) sieve layer is not surpassed and full access is not achieved.

As outlined above, the Public M.A.P.S. model is comprised of Cost, Availability, Functionality, A La Carte, and Locally Relevant Feed(s) puzzle sieve layers. For households that are unable to gain access to PSM by passing through the first Cost puzzle sieve layer, such households are required to attempt to pass through each of the remaining four puzzle sieve layers in order to access PSM. For households that are also unable to pass through one or more of the Availability, Functionality, A La Carte, and/or Locally Relevant Feed(s) puzzle sieve layers,

access to PSM is degraded at best and potentially blocked entirely at worst. The Public M.A.P.S. model demonstrates that public service media does not deliver itself and that the need for CBC/Radio-Canada to enhance the provision of access to its public television programming has only heightened in the digital age rather than diminished.

Digital access to CBC/Radio-Canada's television programming

> In today's world, there is no question that digital technologies and tools have vastly improved our quality of life. In every field of human achievement – from medicine to education and from space exploration to telecommunications – digital innovations and inventions are helping Canadians live better, more productive, healthier lives. (Industry Canada, 2015, p. 2)

Former Minister of Industry James Moore's above-noted foreword to the 2015 report *Digital Canada 150 2.0* expounds on the benefits of digital technologies. Moore's digital mantra is reminiscent of Radiohead's 1997 ode to the computer age, *Fitter Happier*, only without its musings on the downside of digital. Moore seems to be describing digital as a potent elixir capable of remedying any ailment that might be afflicting Canadians. While *Digital Canada 150 2.0* does acknowledge that access to communications remains an issue for Canadians in the digital age, the provision of such access according to the report is to be achieved through the offering of greater consumer choice to an already well-served public,

> Connecting Canadians is about ensuring all Canadians, no matter where they live, have access to high-speed Internet services at the most affordable prices. It is also about offering Canadians more choice in their cellphone provider and the option to pick and choose the combination of television channels they want… (Industry Canada, 2015, p. 4).

Similarly, a September 2016 Ministry of Canadian Heritage consultation paper, *Digital Content in a Digital World: Focusing the Conversation*, prepared by the Liberal government of Justin Trudeau as part of former Minister of Canadian Heritage Mélanie Joly's consultation on

digital Canada, reveals that Canada's new government shares the previous Conservative government's faith in the power of the "digital divine" (Mosco, 2004),

> In a sea of choice and unrestricted access to content from all over the world, it means that Canadians take pride in their creators and actively seek out content produced by Canadians in both official languages because it's great content (Canadian Heritage, 2016, p. 2).

At first blush, the CRTC's 2015 Communications Monitoring Report appears to lend support to *Digital Content in a Digital World: Focusing the Conversation*'s assertion that Canadians already have "unrestricted access to content" via the internet and that "[d]igital content is easily accessed and can be consumed anywhere" (Canadian Heritage, 2016, September, p. 4). As noted in the 2015 CRTC report, "[t]he percentage of [Canadian] households with access to broadband with a download speed of at least 5 Mbps remains at 94% (96% with satellite)" (p. 22), with 77% of households actually subscribing to 5 Mbps download service (p. 10). In terms of mobile wireless subscriptions, the same CRTC report notes that the number of mobile wireless subscriptions in 2013 per 100 households was 84.9 (p. 20).

However, with regards to rural broadband internet access, the same 2015 CRTC Communications Monitoring Report adds that,

> Fixed wireless is major [*sic*] source of broadband Internet connectivity in rural areas, where 31% of households have access available to them via fixed-wireless services but not fibre, cable, or DSL. While rural Canadians have access to services provided by satellite, capacity limitations restrict practical availability to approximately 1.5% of Canadian households. (p. 188).

Households featured in the dissertation presented here that lost OTA access to CBC/Radio-Canada television programming following the shutdown of the public broadcaster's analogue OTA television service described similar functional barriers to accessing CBC/Radio-Canada programming by way of broadband internet, as identified in the 2015 CRTC Communications Monitoring Report. 22 of the 99 households interviewed noted that they lacked

a sufficiently highspeed fixed broadband internet connection and 30 of the 99 households reported problems when attempting to stream video via an internet connection.

Furthermore, successful household streaming of CBC/Radio-Canada television programming was restricted to streaming video on demand (SVOD) and live streaming of linear television programming that the public broadcaster had opted to make available online, presenting access barriers related to programming availability, à la carte service, and locally relevant feed(s). As such, a true replication of household access to CBC/Radio-Canada television programming online, equal to what had been previously provided by analogue OTA television delivery across both CBC/Radio-Canada's English and French television services, had yet to be achieved.

Beyond the individual access predicament experienced by the former analogue OTA CBC/Radio-Canada television-viewing households interviewed, the Public Media Access Puzzle Sieve (Public M.A.P.S.) model developed through the analysis of the research interviews conducted for the dissertation featured here provides insight into how notions of digital technology and digital television delivery efficiency relate more generally to access to public television programming in the digital age. As the Public M.A.P.S. model illustrates, the shift from the provision of PSB to the provision of PSM entails more than a household seamlessly switching to a different mode of public service television or simply embracing new ways of engaging with public service television. Furthermore, the model details that when it comes to PSM delivery, public broadcasters can't expect other intermediaries to faithfully (Latour, 2005) provide households with access to public television. In other words, the Public M.A.P.S. model makes it clear that digital public media does not deliver itself.

While CBC/Radio-Canada continues to refrain from pay-walling domestic online access to its CBC Television and Télévision de Radio-Canada conventional television programming that it opts to make available online, with the exception of certain television programming made available on Tou.tv, 15 of the 99 CBC/Radio-Canada television-viewing households from the dissertation presented here expressed concern about accessing CBC/Radio-Canada television programming online due to anticipated data overage/bandwidth fees. Such households expressed concerns related to the household's ability to view as much CBC/Radio-Canada programming per month as desired without concerns related to monthly usage caps currently common to services offered by Canadian ISPs and mobile wireless providers.

Television access by way of broadband internet and mobile wireless service as embraced by CBC/Radio-Canada and the Canadian government has resulted in both degraded household access to linear CBC/Radio-Canada television programming (when compared to the access that was provided to households in the linear analogue OTA television era) and a lackluster execution of non-linear digital television access in terms of CBC/Radio-Canada's provision of opportunities for meaningful user agency by households that continue to remain relegated to their twentieth century roles as passive analogue television audiences rather than active digital television users.

Broadcasting policy objectives: CBC/Radio-Canada's over-the-air (OTA) television transmitters and the provision of access to programming

Canada's *Broadcasting Act* is the guiding piece of legislation that articulates the aims and objectives of the country's regulated radio and television broadcast system. The Act states that Canada's publicly-owned electromagnetic radio spectrum is to be used to "provide a public service" directed at "the maintenance and enhancement of national identity and cultural

sovereignty" (Section 3. (1) (b)). As detailed via the work of Raboy (1990/1996/2010), Mosco (1989/2003/2004/2009), McChesney (1999/2013), Taylor (2009/2013/2016), and others helps to outline the reasons why Canada's broadcasting system has such stated aims. In addition, the *Broadcasting Act* designates the Canadian Broadcasting Corporation ("the Corporation") as national public broadcaster and specifies what the broadcaster's radio and television services "should" entail. Access to the Corporation's television programming can be evaluated through application of access models such as Clement & Shade's (2000) Access Rainbow model, Brevini's (2013) Components of universal access model, and by way of the Public Media Access Puzzle Sieve (Public M.A.P.S.) model.

The *Broadcasting Act*, forged in an era of analogue television broadcasting, does not quantify what exact level of access is deemed as sufficient when assessing access to the Corporation's television programming. The most recent 1991 version of the act only notes that programming is to "be made available throughout Canada by the most appropriate and efficient means and as resources become available for the purpose" (3. (1) (m) (vii). However, assessing how television programming created by the Corporation is being made accessible in the twenty-first century is a broader question than simply what television signals are available to Canadian households.

While the CRTC's final digital television transition policy for 2011 called for the use of digital OTA television transmitters by broadcasters operating within the national capital region, provincial capitals, and in television markets of 300,000 or more residents was comparatively ambitious when compared to the start of analogue OTA television broadcasting in Canada, unlike the start of analogue OTA television in Canada, the Commission's digital OTA television transmitter placement plan was presented as the be-all and end-all of Canada's digital television

transition. The CRTC's digital television transition plan neither required nor discussed any future requirement for broadcasters to construct additional digital OTA television transmitters in other areas of the country.

The Corporation's final digital television transition plan was limited to the installation of 27 digital OTA transmitters in the 20 Canadian television markets where it had television stations originating television programming in English and/or French. As such, while CBC/Radio-Canada's custom digital OTA transmitter placement plan was dictated in part by the location of the Corporation's analogue transmitters first installed in higher populated metropolitan areas of the country such as Montréal and Toronto in the 1950s, CBC/Radio-Canada's digital OTA television transmitter placement plan was equally guided by location of tower sites established for analogue transmitters installed more recently in non-mandatory digital markets with comparatively fewer residents such as Yellowknife and Rimouski.

Almost all (93 of 99) CBC/Radio-Canada analogue OTA television-viewing households interviewed for the dissertation presented here were unable to regain OTA access to CBC/Radio-Canada television programming following the completion of the public broadcaster's digital television transition in 2012. As such, the role that CBC/Radio-Canada's digital OTA television transmitters played in the ability of the households to access the public broadcaster's television programming was minimal. However, by reflecting upon lost OTA television access to CBC/Radio-Canada, the OTA households were able to make visible elements of access to public broadcasting by way of publicly owned infrastructure previously provided in the Corporation's analogue OTA television era but that were neither extended into the digital era by way of CBC/Radio-Canada's digital OTA television transmitters nor by way of other modes of

household of television delivery hyped to be the future of television delivery such as television delivery by way of ISP or mobile wireless telecom provider.

In terms of the six households that were eventually able to regain OTA access to CBC/Radio-Canada television programming by way of the public broadcaster's digital OTA transmitters, reflections related to the households' newly digital OTA television reception were limited to an acknowledgement that the household once again had OTA television access to CBC/Radio-Canada. As such, the switch to digital OTA for the six households did not represent an enhancement of their access to the public broadcaster but was rather a continuation of the household access (no better, no worse) that had been previously provided by the public broadcaster's defunct analogue OTA television service.

In terms of the use of digital OTA broadcasting for the provision of citizen access to CBC/Radio-Canada television programming by way of publicly-owned spectrum, an opportunity that exists for CBC/Radio-Canada to enhance household access to its television programming that did not exist in the analogue transmitter era involves the use of digital multiplexing. As previously noted, the ATSC digital OTA television broadcast standard now in use in Canada, the United States, Mexico, and elsewhere allows for the same 6 MHz band of spectrum previously allocated to carry a single analogue OTA television broadcast signal to be used to deliver multiple digital television broadcast signals, along with audio signals and other programming information, through a process known as multiplexing. This improvement in spectral efficiency provides an opportunity for ATSC television broadcasters, including CBC/Radio-Canada, to provide additional television services OTA via each swath of 6 MHz spectrum allocated per digital OTA television transmitter. However, CBC/Radio-Canada has so far declined to implement the use of multiplexing for its 27 digital OTA television transmitters (apart from

ATSC Mobile TV testing that ended in 2012). This approach by the Corporation illustrates a contradiction in CBC/Radio-Canada's embrace of digital television programming delivery efficiency since it is not taking full advantage of the opportunities made possible by the ATSC digital broadcast standard. Instead, CBC/Radio-Canada is largely using its 27 digital OTA television service to deliver its television programming in the exact same way that it used its analogue OTA television service (with the exception that it now offers its programming OTA in HD).

For households interviewed for the dissertation presented here, access to CBC/Radio-Canada television feed(s) as identified by the Public M.A.P.S. model was the priority rather than concerns related to broadcast signal quality. Furthermore, on the topic of signal quality, the multiplexing of 6 MHz of spectrum to deliver multiple television sub-channel feeds instead of just one television feed will still permit the broadcast of HD feeds to CBC/Radio-Canada audiences. As noted in a report prepared for Industry Canada on the topic of Canada's future spectrum needs, for a digital television broadcaster that is using multiplexing,

> The usual configuration is for a multiplexer to accommodate a single HDTV stream, plus one or two extra SDTV programs. Up to 6 SD (standard definition) TV programs could be accommodated by a 6 MHz OTA channel operating a 19.3 Mbps channel.
>
> (Industry Canada, 2012, p. 91).

As detailed above, it is clearly possible that CBC/Radio-Canada could implement multiplexing and still continue to broadcast a single HD feed from each of its 27 digital OTA television transmitters along with at least one SD subchannel. Such use of digital OTA television multiplexing by CBC/Radio-Canada would assist the public broadcaster in improving citizen access to its television programming without the risk of degrading the digital OTA television HD signal currently being broadcast by each CBC/Radio-Canada digital transmitter.

In terms of the role that CBC/Radio-Canada's digital television transmitters currently play in making the public broadcaster's television programming available to Canadian households, members of CBC/Radio-Canada Management interviewed for the dissertation presented here advised that its digital transmitters play a tertiary role in the provision of household access to its programming. Members of CBC/Radio-Canada Management advised that the public broadcaster's operation of digital OTA television transmitters is not based primarily on the notion that households are accessing its programming over-the-air. Instead, Management advised that one of the main reasons why the public broadcaster currently operates digital OTA television transmitters in 20 Canadian television markets is so that the public broadcaster can continue to compete for advertising revenue. Since the Canadian television advertising market and the rights of television broadcasters to sell adverting spots in certain markets continues to be based on the signal footprint of OTA television transmitters, members of Management advised that the Corporation needed to maintain the operation of OTA television transmitters in markets where it hoped to continue to sell advertising. The selling of CBC/Radio-Canada television commercial spots to advertisers would then provide the Corporation with the revenue needed to supplement its annual federal funding allocation shortfalls each year and to continue operations. By continuing operations as a public broadcaster, CBC/Radio-Canada television would also retain mandatory carriage on the basic service packages provided by the Canadian BDUs that the majority of Canadian households rely on for access to television programming (including CBC/Radio-Canada programming).

In contrast, OTA CBC/Radio-Canada television-viewing households featured in the dissertation presented here that lost access to the public broadcaster following the completion of its response to Canada's digital television transition continued to value OTA television

transmitters as direct means by which to access the public broadcaster's television programming. However, since CBC/Radio-Canada declined to install any digital OTA retransmitters as part of its approach to Canada's digital television transition, households located outside of markets with CBC/Radio-Canada originating stations did not receive digital OTA access to the public broadcaster.

Effective spectrum regulation and access to CBC/Radio-Canada television programming

The Government of Canada did not opt in 2011 to end the use of publicly-owned spectrum to provide OTA television broadcasting to Canadians as part of the repurposing of the 700 MHz band of spectrum. On the contrary, it selected OTA digital television as the television delivery medium best suited to bring HD television programming to Canadians due to its superior access qualities. The stated aims of Canada's digital television transition included the generation of revenue for the government from the 700 MHz spectrum auction, the clearing of spectrum within mandatory digital markets for wireless broadband use, improved picture and sound quality, the option of multiplexing for markets with digital OTA television delivery, and the clearing of spectrum for dedicated safety and emergency uses.

While the portions of 700 MHz spectrum auctioned off by Industry Canada have been put to other use, such a LTE Advanced wireless services for mobile wireless communications, it's unclear what, if any, use is being made of the spectrum located outside of the 700 MHz band that CBC/Radio-Canada had previously used for analogue OTA television broadcasting. Since most of CBC/Radio-Canada's analogue OTA television transmitters were attached to "towers in the middle of nowhere" (Stursberg, 2012, p. 266), it is likely that the spectrum previously allocated for use by such transmitters (outside of mandatory digital television markets and outside of the 700 MHz band) is no longer being used for anything and instead lays fallow. While the CRTC's

digital television transition regulations did not require CBC/Radio-Canada to vacate such spectrum outside of mandatory digital markets (unless the analogue OTA transmitters were operating at full-power on channels 52 to 69), Canada's digital television transition nonetheless resulted in CBC/Radio-Canada abandoning spectrum that has likely not been put to other use.

The Public M.A.P.S. model presented here details evidence of the importance of the provision of public television access in the digital era. CBC/Radio-Canada's hands-on direct involvement in the digital delivery of its television programming to Canadian households is called for in an era where BDU television's appeal, and its regulatory support in the name of the public interest, is in question. If CBC/Radio-Canada is still up for the challenge of attempting to maintain the imagined nation of Canada in the digital age (Anderson, 1983), a renewed focus by CBC/Radio-Canada on eliminating, or at least minimizing, barriers to household access to its television programming in the digital age, as related to household cost, programming availability, viewing functionality, à la carte service, and locally relevant feed(s) is overdue.

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