

**Telesat's Canadian Satellite Capacity and Services
Plan for the 17 GHz BSS Orbital Resources at
111.1°WL and 113°WL**

[Public Version]

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Introduction

In accordance with the directions set out in Notice No. DGRB-003-09 – *Call for Applications to License 17 GHz BSS Spectrum at the 111.1°WL and 113°WL Orbital Positions*, the following constitutes Telesat Canada's *Canadian Satellite Capacity and Services Plan* for development of these valuable Canadian resources.

1. Description of the Consultation Undertaken

Shortly after Industry Canada issued its initial *Call for Applications* in July of 2006 announcing the availability of the 17 GHz BSS 111.1°WL and 113°WL positions (and other positions), Telesat began canvassing potential Canadian customers to ascertain their interest in new satellite capacity. Various Canadian industry groups and associations (e.g., Canadian Satellite Users Association (now known as the Canadian Broadcast Distribution Association - "CBDA"), Canadian Association of Broadcasters ("CAB"), and Canadian Cable System Alliance ("CCSA")) were contacted at the same time to discuss the capacity requirements of their respective members.

During those discussions, Shaw Broadcast expressed an interest in obtaining substantial capacity from Telesat in this orbital neighbourhood. Shaw's subsidiary, Star Choice, is the prime user of spectrum in this Canadian broadcasting neighbourhood for its Direct-to-Home ("DTH") and Satellite Relay Distribution Undertaking ("SRDU") services, and the original application Telesat filed with Industry Canada in November 2006 for developing the orbital resources in this neighbourhood addressed Star Choice's expansion capacity requirements in a full and comprehensive manner. Only Telesat applied for use of the 17 GHz BSS frequencies at the 111.1°WL and 113°WL positions. Telesat has continued to work closely with Star Choice (and the industry associations) to satisfy their capacity demands, as presented in the current Application.

2. Requirements for Capacity and Service in the Neighbourhood

The 111.1°WL and 107.3°WL orbital positions constitute Canada's core FSS broadcasting neighbourhood. The Star Choice DTH service carried on Telesat's Anik F1R and F2 satellites at these two orbital positions now consists of hundreds of programming channels (including a number of High Definition ("HD") TV services), delivered to close to 900,000 Canadian households. The SRDU service also delivered through the Star Choice platform is the largest in Canada, allowing

cable TV and other distributors located in all parts of the country greater access to the full range of television programming services for distribution to their end-user customers.

Telesat's market analysis indicates that Star Choice and other Canadian broadcasters will have substantial demand for new satellite capacity in the neighbourhood over the next several years, driven largely by the increasing popularity and huge bandwidth requirements of HD television programming.

The following main demand drivers have been identified for use of 17 GHz BSS frequencies:

- **Conversion of programming services to HD format:** Currently, a transponder can transmit a maximum of 10 to 12 Standard Definition ("SD") TV programming channels, whereas this number falls to a maximum of 4 to 6 channels per transponder for programming in HD format, assuming the full deployment of next generation transmission standards. While it is expected that the full conversion of the existing Canadian broadcast distribution undertaking ("BDU") base of some 400-plus programming services from SD to HD format could take up to 10 years to complete, the bulk of that conversion is expected to occur within the next three to five years. Conversion of the existing base of programming services to HD format will therefore require in the order of twice as many transponders in the next five years than are used today to deliver this programming.
- **Growth in the existing base of programming services:** Over the past several years, approximately 30 new specialty and pay-per-view programming services have been licensed each year by the CRTC for distribution in Canada. While it is unlikely that all new services will be launched commercially, a significant number of them will, likely in HD format. Based on next generation transmission standards, transponder demand will increase by one transponder for every 4 to 6 new programming services distributed via satellite (i.e., between 5 and 8 additional transponders would be required each year to accommodate the yearly introduction of 30 new programming services in HD format).
- **Development of new broadcasting applications:** The surge in new broadcasting service applications, such as mobile television, is expected to continue over the next few years. While no precise Canadian demand estimates are presently available, it is expected that satellite technology, with its inherent advantage in the delivery of broadcasting services over a wide geographic area, will play an increasingly

important role in the carriage of these services, likely as part of hybrid satellite/terrestrial networks.

- **Demand from outside Canada:** In addition to the identified requirements from the Canadian broadcasting community for spectrum at this location, Telesat expects that capacity in this frequency band will be in demand from non-Canadian markets.

Taken together these drivers indicate that substantial new Canadian capacity demand will materialize over the next several years in this broadcasting neighbourhood and will require the phased introduction of a considerable amount of new satellite capacity.

3. Capacity and Service Plan

The ability of Star Choice and other Canadian broadcasting customers to continue growing their existing businesses or introduce new services at Ku-band in the 107.3°WL/111.1°WL neighbourhood is now effectively constrained, as all available frequencies in the conventional Ku-band on Telesat's satellites are being used. Further capacity expansion in this neighbourhood therefore necessitates the development of other suitable frequency bands.

There are two candidates for capacity expansion in this neighbourhood, Extended Ku-band and 17 GHz BSS. Canadian broadcasting customers will need access to both sets of frequencies over the next several years to satisfy their demand requirements in a timely and cost-effective manner. Telesat currently holds the authorization for the Extended Ku-band frequencies at the 107.3°WL and 111.1°WL positions and is seeking the authorization for the 17 GHz BSS frequencies at 111.1°WL and 113°WL with this Application. To enable a competitive supply of additional capacity in this key Canadian broadcasting neighbourhood, that Telesat has helped to develop, the company is proposing to use both frequency bands.

The objective of Telesat's plan for development of these spectrum resources is to meet two primary requirements:

- introduce, in a timely and cost effective manner, new capacity that is sufficient to address anticipated Canadian broadcasting customer demand requirements in this neighbourhood over the next several years. The increased demand flows from the introduction of new programming services, the required conversion of signals to HD format, increased carriage obligations associated with recent CRTC decisions, as well as new demand expected to arise from the widespread deployment of new broadcasting applications, and

- ensure that satellite diversity and emergency back-up capabilities are available in the event of a catastrophic failure or serious degradation in another Telesat satellite in this neighbourhood.

To meet these objectives, Telesat is proposing to launch two new satellites, using Extended Ku-band and 17 GHz BSS, at the 107.3°WL and 111.1°WL/113°WL positions, by early 2012.

The first of these new satellites would introduce enough new capacity in the neighbourhood to accommodate CSUA's (now the CBDA) demand estimate for HDTV conversion of 30 to 50 percent of existing programming channels. In fact, assuming a fairly aggressive adoption of new transmission and encoding standards, if the equivalent of all this new capacity were used to accommodate HDTV, by 2012 approximately 50 percent of Star Choice's existing base of programming services could be converted to HD format with the launch of the first new satellite. Alternatively, a significant portion of this new capacity could be used to address the other anticipated new capacity demand requirements identified above (i.e., to launch new programming services or for new applications), and still allow the number of existing services converted to HDTV format to fall within the 30 to 50 percent target range. After reaching this 50 percent plateau, additional new capacity will be required in this neighbourhood to satisfy the CSUA's HD conversion target of 75 percent of existing channels in the next 5 years.

Telesat would be in a position to address these additional demand requirements with the launch of the second proposed satellite to commence service in 2012. With its launch, sufficient new capacity would be available to meet the 75 percent conversion target and leave a "surplus" of approximately 10 additional transponders. These surplus transponders could be used to accelerate the HD conversion process towards the 100 percent mark, or to launch other new service applications.

Table 4.1-1 illustrates this phased introduction of additional capacity in this Canadian broadcasting neighbourhood with the launch of the new Telesat satellites

Table 4.1-1: Phased Introduction of Satellite Capacity in the 111.1°-107.3°WL Neighbourhood

Year	New Satellite In Service (Location)	New Transponders Available (Cumulative)	CSUA HDTV Conversion Target
2011	Extended Ku (107.3°WL)	15	30-50 %
2012	17 GHz BSS (111.1°WL)	47	50-100 %

The introduction of new capacity at the 107.3°WL and 111.1°WL/113°WL positions also serves to introduce a measure of backup capacity or other emergency restoration options for Telesat's Canadian broadcasting customers in this neighbourhood. It is expected that most, if not all, of the capacity on the new Extended Ku-band and 17 GHz BSS satellites will be taken up fairly quickly by Star Choice and Telesat's other Canadian broadcasting customers for HD conversion and service expansion. However, with the broadcasting services spread over the satellites in this neighbourhood (Anik F1R, Anik F2, new Extended Ku-band and 17 GHz BSS satellites), and with flexibility on the extended Ku-band satellites to switch capacity into the conventional Ku-band, there is increased satellite diversity and greater flexibility for customers like Star Choice to maintain or restore the bulk of their services should there be a satellite malfunction.

This capacity plan therefore meets the two primary customer requirements, namely, the timely introduction of significant new capacity in this neighbourhood, and increased satellite diversity and emergency back-up capabilities in the event of a catastrophic failure or serious degradation in another Telesat satellite in this neighbourhood.

Satellite Design and Coverage

The proposed new 32-transponder 17 GHz BSS satellite would use the full 500 MHz of spectrum, i.e., 24.75 to 25.25 GHz in the uplink and 17.3 to 17.8 GHz on the downlink, as well as both polarizations. The satellite would be designed for a 15 year service life. Construction of the satellite would take approximately 30 months from the date of contract signature with the satellite manufacturer to in-orbit delivery.

Table 2: Basic Features of the Proposed Satellite

Baseline Configuration	Single payload using 17 GHz BSS spectrum and associated FSS feederlink. Separate coverage of Canada and U.S.
Frequency Bands	24.75 – 25.25 GHz uplink 17.3 – 17.8 GHz downlink
Orbital Position(s)	113°WL and 111.1°WL
Payload	32 transponders of 24 MHz using TWTAs of 150W
Geographical Coverage	Two independent downlink coverage areas: <ul style="list-style-type: none"> • Canada only • Continental U.S.
Network Connectivity	Broadcast
Program Schedule	30 months

The satellite would be designed to provide optimal coverage of all areas of Canada, but with coverage switchable on a transponder-by-transponder basis to include the continental U.S. for any capacity not spoken for by Canadians in the planning stage. The conceptual Canadian transmit and receive coverage maps are presented in Figures 1 and 2 below for operation of the satellite at the 111.1°WL position. Proposed coverage will be included in the satellite design package submitted to Industry Canada for approval

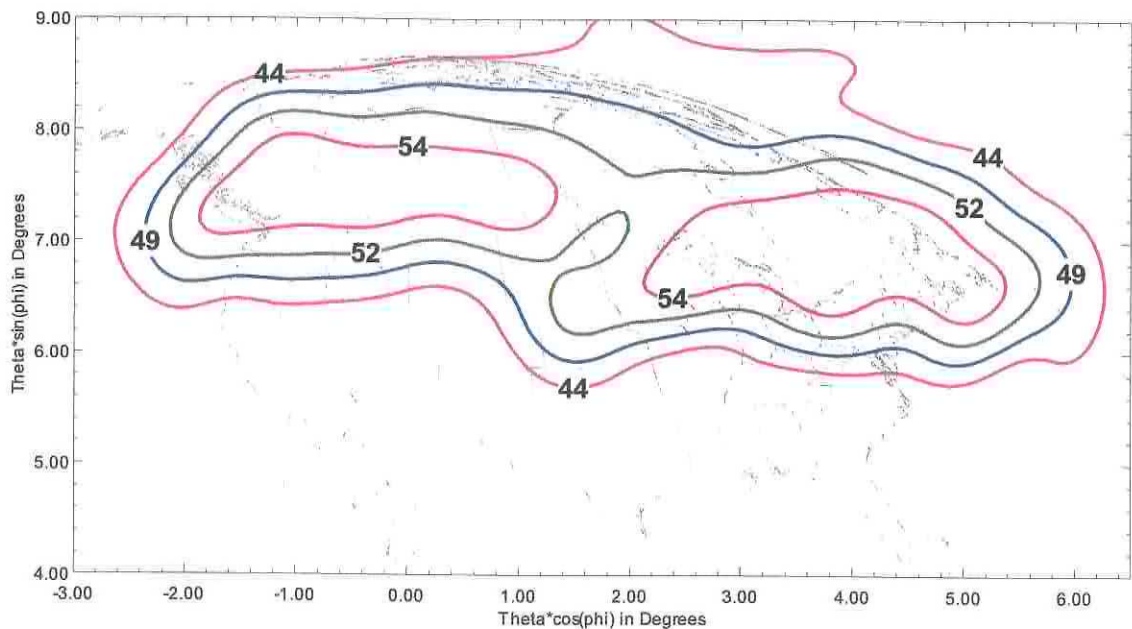
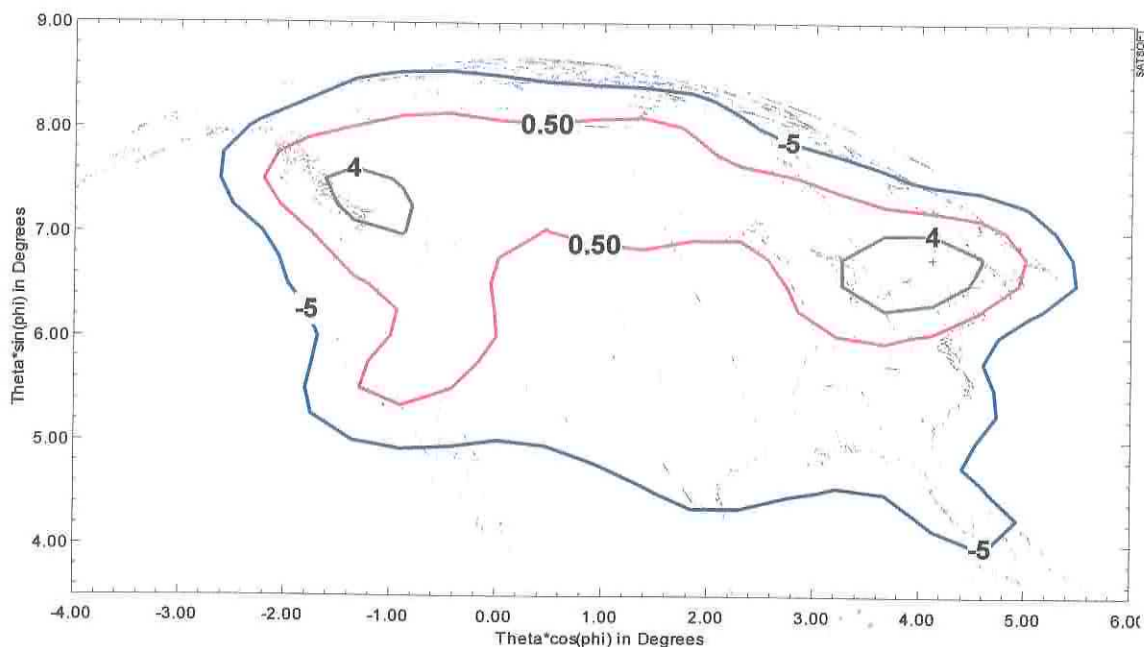


Figure 1: Transmit Coverage of Canada

Figure 2: Receive Coverage



Marketing Approach

For both the Extended Ku-band and 17 GHz BSS satellites at 107.3°WL and 111.1°WL, Telesat will first market the capacity for use in Canada, and will be looking for anchor tenants to commit to a significant portion of the total available capacity. Capacity on these satellites will be offered to Canadian entities on a first-come first-served, non-discriminatory basis.

Star Choice has previously indicated a strong interest in contracting for substantial capacity in this Canadian broadcasting neighbourhood to expand its existing DTH/SRDU services, and will be a major prospective Canadian user targeted in Telesat's marketing and sales efforts.

It is expected that capacity on the satellite will be sold largely, if not exclusively, on a wholesale basis. That is, customers will combine the satellite capacity with other value-added services (such as DTH and mobile broadcasting service offerings) for resale directly to end-user consumers.

Telesat typically provides contractual flexibility with regard to contract term and other business arrangements. Generally, subject to availability, Telesat offers capacity on terms that vary depending on the amount of capacity procured (from partial channels to blocks of transponder sales) and the

length of the contract term (one month to life of satellite and beyond). Customers contracting for larger amounts of capacity and longer terms can expect lower prices.

Telesat will use its existing sales team and support staff to sell the capacity and to service customers. This includes a sales application engineering team to provide both pre-sale and post-sale technical consultation and support to customers, as required.

Telesat wealth of experience and expertise will also be available to effectively serve Telesat customers on the new satellite.

4. Procedure for Customers to Obtain Capacity/Services

Telesat will operate its proposed satellites as a Canadian telecommunications common carrier, offering service from each of these satellites on a non-discriminatory, first-come, first-served basis as noted above. This first-come, first-served capacity reservation process is open now, conditional on Telesat ultimately being awarded the requisite authorization to develop the 17 GHz BSS frequencies at the 111.1°WL position. (Telesat already has the authorization to develop the Extended Ku-band frequencies at 107.3°WL and 111.1°WL.)

Telesat has been in initial discussions with prospective customers known to have an interest in significant new capacity in this neighbourhood, and will initiate a formal Call for Interest in capacity on this satellite. This Call for Interest will remain open long enough to allow prospective Canadian users sufficient time to determine their capacity requirements at these orbital positions and to convey any firm demand requirements to Telesat. Thereafter, and before finalizing the design specifications of the satellite for submission to Industry Canada for approval, Telesat will seek other possible users and anchor tenants.