



October 8, 2014

Senior Director
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Re: *Canada Gazette*, Part 1, September 6, 2014, Notice No. DGSO-003-14 —
*Consultation on Policy Changes in the 3500 MHz Band (3475-3650 MHz) and a New
Licensing Process in Rural Areas*

Dear Sir/Madam:

The Satellite Industry Association (“SIA”)¹ hereby submits these comments to Notice No. DGSO-003-14, *Consultation on Policy Changes in the 3500 MHz Band (3475-3650 MHz) and a New Licensing Process in Rural Areas* (“the Consultation”). In particular, SIA addresses Question 7 of the Consultation, which invites comment on the proposal to reallocate the 3475-3650 MHz band to include mobile services, and to make consequential changes to the *Canadian Table of Frequency Allocations*.

¹ SIA is a U.S.-based trade association providing worldwide representation of the leading satellite operators, service providers, manufacturers, launch services providers, and ground equipment suppliers. Many SIA members conduct business in Canada. SIA Executive Members include: The Boeing Company; The DIRECTV Group; EchoStar Corporation; Harris CapRock Communications; Intelsat S.A.; Iridium Communications Inc.; Kratos Defense & Security Solutions; LightSquared; Lockheed Martin Corporation; Northrop Grumman Corporation; SES Americom, Inc.; and SSL. SIA Associate Members include: Airbus DS SatCom Government, Inc.; Artel, LLC; ATK Inc.; Cisco; Cobham SATCOM Land Systems; Comtech EF Data Corp.; DigitalGlobe, Inc.; DRS Technologies, Inc.; Encompass Government Solutions; Eutelsat America Corp.; Globecom Systems, Inc.; Glowlink Communications Technology, Inc.; iDirect Government Technologies; Inmarsat, Inc.; Exelis, Inc.; Marshall Communications Corporation.; MTN Government; NewSat America, Inc.; O3b Limited; Orbital Sciences Corporation; Panasonic Avionics Corporation; Raytheon Space and Airborne Systems; Row 44, Inc.; TeleCommunication Systems, Inc.; Telesat Canada; TrustComm, Inc.; Ultisat, Inc.; Vencore Inc.; ViaSat, Inc., and XTAR, LLC.

The Consultation and the documents referred to therein are lacking in factual basis and technical analysis. For example, the demand for more spectrum for mobile services is assumed, rather than examined. The Consultation refers to the March 2013 Commercial Mobile Spectrum Outlook² and to requests from mobile service licensees (or entities with corporate links to such licensees),³ but omits mention of studies that show that future mobile spectrum requirements have been overestimated and that spectrum already allocated for mobile services has not yet been fully utilized.⁴ These studies also warrant proper consideration by Industry Canada, and should inform the decisions being made.

SIA recognizes that frequency allocation tables must be living documents, adjusted periodically as technology evolves. However, the changes envisioned in the Consultation are premature. Before any fundamental changes are made, certain logically antecedent issues must be addressed. For example:

- Does available data support allocation of additional bandwidth for a service?
- Is such data available from a source that does not stand to directly benefit from, or be adversely affected by, the proposed change?
- Can any negative effect on other services due to the change be satisfactorily mitigated? If so, what is the proposed technical framework that will permit such mitigation?

A decision to add an allocation to the frequency allocation table must be supported with appropriate technical analysis of how existing services in a band or in adjacent bands would be affected by a new service, and how the incumbents can be properly protected. In this case, while there are relatively few co-frequency earth stations in the 3500 MHz band in Canada or in the neighboring United States, the method by which these stations will be protected from mobile interference must first be considered and established.

Industry Canada itself has previously concluded that “[s]haring between mobile base stations or subscriber terminals and FSS earth stations would be very difficult.”⁵ This is

² Industry Canada, Commercial Mobile Spectrum Outlook (Mar. 2013) (hereinafter, “Commercial Mobile Spectrum Outlook Report”), available at [https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/Outlook-2013-en.pdf/\\$FILE/Outlook-2013-en.pdf](https://www.ic.gc.ca/eic/site/smt-gst.nsf/vwapj/Outlook-2013-en.pdf/$FILE/Outlook-2013-en.pdf).

³ Consultation, at 13.

⁴ LS Telcom, Analysis of World-Wide Licensing and Usage of IMT Spectrum (Sept. 2014), available at http://www.lstelcom.com/fileadmin/content/marketing/Press_releases/Licensing_and_use_of_IMT_Spectrum_version_101.pdf. Mehta, Aalok and Musey, J. Armand, Overestimating Wireless Demand: Policy and Investment Implications of Upward Bias in Mobile Data Forecasts (Aug. 2014), available at <http://ssrn.com/abstract=2418364>.

⁵ Commercial Mobile Spectrum Outlook Report, at 4.2.6.

consistent with studies of co-frequency sharing in this band that has been submitted to the ITU.⁶ The challenges of interference protection for co-frequency FSS earth stations in Canada or neighboring United States may or may not be insurmountable in the 3500 MHz band. But the answers to those challenges will only be known after the effort has been made to consider and address those challenges of co-frequency sharing between mobile and FSS stations.

Industry Canada's proposal to introduce mobile services in the 3500 MHz band may also cause adjacent band interference into the many FSS earth stations operating above 3700 MHz that are located in Canada and in the United States. There are many more FSS earth stations operating above 3700 MHz than there are earth stations in the 3500 MHz or in the adjacent 3650 MHz band, so an analysis of the adjacent band interference issues is critical.

In the U.S. Federal Communication Commission's ("FCC") proceeding, *Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Bands* (the "U.S. 3500 MHz Proceeding"),⁷ proponents of "small cell" mobile deployments in that band have acknowledged that "OOBE [out-of-band emission] protection zones are necessary."⁸ In other words, out-of-band emissions from mobile service transmitters in the 3500 MHz band will interfere with earth stations operating in the adjacent 3700-4200 MHz band, unless adequate separation distances are maintained.⁹ The size of the necessary separation distances depends on the transmit power and out-of-band emissions mask of the mobile transmitters in the 3500 MHz band. Depending on the allowed in-band power levels, the out-of-band emissions mask, relative antenna orientation, and surrounding terrain, SIA's engineering analysis suggests that the distances could be in the tens of kilometers for a single interferer (and would likely increase when aggregate interference is considered).¹⁰ Such distances suggest that mobile transmitters in this band could pose interference threats to FSS earth stations both in Canada and those just across the border in the United States.

⁶ ITU-R Document 4-5-6-7/584 (Annex 11, Attachment 3): Draft new Report ITU-R [C-BAND DOWNLINK] "Sharing studies between IMT-Advanced systems and geostationary satellite networks in the fixed-satellite service in the 3 400-4 200 MHz and 4 500-4 800 MHz frequency bands in the WRC study cycle leading to WRC-15", available at https://www.itu.int/md/choice_md.asp?id=R12-SG05-C-0126!R1!MSW-E&lang=en&type=sitems.

⁷ Federal Communications Commission, *Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Bands*, Further Notice of Proposed Rulemaking, GN Docket 12-354, 29 FCC Rcd 4273 (2014).

⁸ Letter from Aparna Sridhar, Telecom Policy Counsel, Google Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, filed in U.S. 3500 MHz Proceeding, Declaration of Dr. Preston Marshall ("Marshall Declaration") at 16, ¶ 30 (filed Sept. 3, 2013).

⁹ Filters on FSS receivers will not protect against out-of-band emissions of the mobile service transmitters that fall inside the FSS receive band, as such filters would block the wanted satellite signal as well.

¹⁰ Comments of the Satellite Industry Association, Docket 12-354 at Technical Annex (July 2014) filed in U.S. 3500 MHz Proceeding, available at <http://apps.fcc.gov/ecfs/document/view?id=7521384256>.

The Consultation suggests that the technical parameters for the new mobile service would be considered in a subsequent consultation.¹¹ Industry Canada should analyze the conditions for sharing *before* reaching conclusions on whether an allocation for the mobile services should be made in the 3500 MHz band. In this regard, a recent engineering report filed by SIA in the U.S. 3500 MHz Proceeding,¹² currently before the FCC, illustrates some of the potential sharing difficulties. A copy of this report is attached, for reference.¹³ Again, the sharing issues may or may not be insurmountable given the conditions in Canada, but Industry Canada must investigate and logically consider those issues before deciding to add an allocation for the mobile service in the 3500 MHz band.

SIA urges Industry Canada to fully develop the record before making any change to the *Canadian Table of Frequency Allocations* by (a) fully analyzing the need for additional mobile service spectrum and the efficiency with which current mobile service spectrum is being used; (b) proposing technical standards that would apply to mobile service transmitters that would be permitted to operate in the 3500 MHz band; (c) conducting a technical analysis of the aggregate interference effects, including out-of-band effects, should such technical standards be adopted for the mobile service; and (d) initiating a full public consultation to enable review and comment of the proposed standards and the results of the Department's technical analysis.

Respectfully submitted,

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Attachments

¹¹ Consultation, at 53.

¹² Comments of the Satellite Industry Association, Docket 12-354 at Technical Annex (July 2014), available at <http://apps.fcc.gov/ecfs/document/view?id=7521384256>.

¹³ See Attachment A, Technical Annex of the Comments of the Satellite Industry Association, Docket 12-354 Technical Annex (July 2014) filed in U.S. 3500 MHz Proceeding.