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October 26, 2020

Innovation Science and Economic Development Canada
Spectrum Licensing and Auction Operations
235 Queen Street (6th Floor, East Tower)
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To the Spectrum Licensing and Auction Operations Branch

Re: *Canada Gazette*, Part I, August 2020, Consultation on the Technical and Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band” (SLPB-002-20)

MDA is pleased to have an opportunity to respond to the document “Consultation on the Technical and Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band” (SLPB-002-20) issued by the Spectrum Licensing and Auction Operations branch at Innovation, Science and Economic Development (ISED) in August 2020. As the largest space technology developer and contractor in Canada and a member of the global satellite communications community, we are well aware of the importance of 5G deployments to the improvement of communication, social and economic welfare and entertainment services to Canadians. We also understand the importance of providing continuity to those Canadians who today rely on satellites for these same services.

As recognised in the consultation document, C-Band based satellite services are important to our northern communities. Satellite services in C-Band are also critical in providing links to the Department of National Defence and other government organisations operating in our northern latitudes. MDA is confident that, in response to this consultation, the current providers of these services will propose answers to the question of continuity of service today and beyond. MDA fully supports these companies in their important role in ensuring both the social and economic welfare of Canadians. We look forward to working with them, having played an active role in defining these solutions.

As an integral part of the Canadian space economy and as a source of innovation and high technology talent in support of that economy, we at MDA feel there are three important priorities that need to be imbedded in any action moving forward, in order to maximise the economic benefit to Canada:



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1. To adopt an approach similar to that of the US in terms of financial compensation to satellite operators that enables them to quickly clear the C-Band to facilitate the introduction of 5G services at the same time as they are introduced in the US;
2. To maximise Canadian content in the implementation of any new satellite-based infrastructure being proposed as a result of the C-Band spectrum reallocation; and
3. To invest in the space manufacturing industry in order to ensure Canadian future leadership in the integration of satellites into the global 5G infrastructure.

Staying Competitive with the US

In order to reconcile the timeline and objectives of affordable and quality 5G services in Canada, while ensuring services continuity to its population, Canada may need to adopt a similar approach as in the US which included financial compensation to satellite operators.

Financial incentives provided to satellite operators for a timely repurposing of C-Band spectrum in Canada can result in the rapid deployment of new space and ground infrastructure, not only in order to provide service continuity, but with the potential to provide high quality universal connectivity to Canadians more quickly than a traditional approach. This is a unique generational situation that calls for a unique generational response.

Maximising Canadian Content

At this time, we are not advocating a particular solution to repurposing the C-Band in Canada. However, having agreed with the principle that satellite operators should be compensated for doing the work to accelerate the clearing as well as for the costs associated with clearing the C-Band, we strongly advocate that proceeds from this compensation should in turn be spent in Canada.

In terms of solving Canada's digital divide, we also believe that inevitably this may involve a departure from current land-based connectivity policies and solutions (broadband by fibre) toward an updated approach that may deviate from the current Geosynchronous-based satellite solutions to include- multiple, or constellations, of smaller satellites in low and medium Earth orbits operating in higher frequency bands. These satellite constellations are well suited to provide broadband-like coverage to rural and remote communities, including Northern Canada, more quickly and with less cost than traditional fibre solutions.



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The development of these satellite constellations generally involve large multinational contractor teams, but Canadian industry – MDA and the cross-Canada industrial base – is very capable of leading and providing many of the space and ground technologies required. It is important therefore that Canadian content is a major criterion in the government's consideration of these solutions and their overall benefits to Canadians. All of MDA's competitors enjoy this consideration for the development of national satellite programs. To illustrate this, the decision by the US to compensate both US and foreign-based satellite operators for C-Band repurposing has resulted in multiple procurements directed to US space contractors. We would expect the same requirement to invest in the Canadian space industrial base from any solution that benefits from Canadian funding.

Global 5G and the Integration of Satellite and Terrestrial Networks

Due to the challenges of our geography, the demands in protecting our sovereignty in the Arctic and Northern Territories, and the desire to improve the quality of life for Canadians wherever they live, historically Canada has taken a lead role in the development of communication satellite technologies, infrastructure and related applications, and is seen as a leader among peers in the United States, Europe and Japan. We, in Canada, proudly refer to our achievement in placing the third satellite in space, Alouette, with its purpose to study the effects of the ionosphere on radio communications in the North, leading to the understanding of the role that satellites could play in providing telecommunications services across all of Canada. We also point to our achievement in providing the world's first domestic Geosynchronous satellite system (Anik A1). We highlight our leadership in Direct-to-Home satellites and the first commercial deployment of a multibeam Ka-Band satellite (Anik F2), a deployment that enabled consumer satellite broadband. This leadership position was the result of deliberate policy decisions by the Government of Canada in addition to strategic investments by both Canadian industry and government extending back to the 1960s and 70s.

Each of these former initiatives allowed Canadian industry to lead at a time of dramatic changes in both the communications and entertainment world. Likewise, the C-Band spectrum clearance process, combined to on-going evolution of 5G standards, provides a unique opportunity to revisit satellite communications at another point of transformation and to position Canada for a renewed international leadership role that has the potential to unlock economic development in rural, remote and Northern communities

The recent COVID-19 pandemic has demonstrated to all Canadians the importance of Internet connectivity as we adjust to working remotely. The introduction of 5G technologies on a global scale will further allow Canadians to take advantage of a more mobile and less urban lifestyle. However, despite its promise of power and speed in applications, 5G in itself cannot solve the global or Canadian connectivity problem for rural and remote communities, a key thrust of the



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Government of Canada's Connectivity Strategy. The potential role for satellite-based communications in the 5G ecosystem is crucial and has been widely recognized. Not only can satellites provide ubiquitous, anytime coverage, but they can provide cost-effective coverage to many areas of Canada and the globe which might otherwise go unserved by terrestrial based 5G networks. Satellites can offer complementary connectivity options, seamless user experience, and provide important benefits to enable the terrestrial 5G infrastructure. These features are critical to the successful deployment and operation of 5G networks across Canada.

Major technological advancements are required to integrate satellite and terrestrial 5G systems that have to date been separated. In so doing, the user can be integrated into a global standardized system irrespective of location or current need (mobile or fixed). To be part of this new generation of business, Canadian industry will have to undertake a major development of new technologies in, for example, digital and photonic space payloads that are fully integrated with phased array antennas and laser inter-satellite links. This space segment will need to be fully integrated with a common network management system on the ground, capable of smart and adaptive end-to-end routing.

In meeting this next-generation challenge, MDA proposes to work with the Canadian government and the rest of the Canadian satellite communications manufacturing community to propose a 5-year development program leading to a technology demonstration program that would enable the first fully-integrated 5G space and terrestrial service to selected locations in Canada, as a first step. The ultimate goal would be to enable the full roll-out of a next generation 5G network to all regions of Canada.

In summary, it is becoming clear that most nations, both developed and developing, have recognised the important part that an integrated global communications network plays in the modern world and that space-based communications is a potential key element of unlocking economic development. This will be even more of a factor in a post-COVID-19 world where we will see many changes in the way populations live and conduct business. It is clear that connectivity and innovative communication technologies are going to become a necessary part of the post-COVID recovery to help us build back better. The rising demand for connectivity and data consumption experienced during the pandemic will persist and become a part of normal life. This new reality will create enhanced market opportunities for the Canadian satellite industrial sector to provide the required technologies and application solutions. In undertaking this proposed development activity, the Government of Canada will not only be providing continuity of coverage for existing service offerings, but will provide a model for future services, ensuring maximum economic return to Canada and a sustainable high-quality workforce in both space and ground satellite communications industries, continuing the sector's important contribution to the national economy.

In concluding our response to the consultations on the proposed repurposing of the C-Band spectrum, we would like to highlight the following five points:



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- We support the action of the Government of Canada in repurposing C-Band spectrum for the deployment of high quality and affordable 5G services.
- We support the request by satellite operators for compensation for the costs to clear this spectrum on an expedited basis to ensure they remain competitive with the situation in the US.
- We will support satellite operators in offering solutions to ensure continuity and enhanced services to both the Government and rural and remote Canadians.
- We request that the Government of Canada ensures the maximum of Canadian content in the manufacture and deployment of any new space and ground infrastructure that would be deployed as a result of the spectrum repurposing activity.
- We request that the Government of Canada works with MDA and other Canadian manufacturers to plan and implement a technology development program leading to a demonstration of full satellite and terrestrial wireless 5G integration.

Thank you for the opportunity to respond to this consultation. We are happy to provide further information should you require it.

Sincerely,

A handwritten signature in blue ink, appearing to read "JBoshouwers", with a horizontal line extending to the right.

Joanna Boshouwers
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