Intervention

27 June 2017

Re: Telecom Notice of Consultation CRTC 2017-112
Development of the Commission's broadband funding regime

Intervener:

SouthWestern Integrated Fibre Technology (SWIFT) Inc.

- By submitting this intervention we indicate our intent to become a party to this proceeding.

- Submitted to CRTC via My CRTC Account.
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This submission has been prepared under the direction of SWIFT by Dr. Reza Rajabiun, Ted Rogers School of Information Technology Management, Ryerson University.

Executive summary:

1. SouthWestern Integrated Fibre Technology (SWIFT) is an initiative by the Western Ontario Warden's Caucus (WOWC) and other communities in Southwestern Ontario and Niagara Region (the "Region") to promote the development of ultra-high capacity fibre-optic connectivity throughout the Region. Thanks to funding from different levels of government, the objective of SWIFT's long-term infrastructure development plan is to ensure everyone in Western Ontario has equitable access to ultra-high capacity fibre-optic connectivity to the Internet by 2040, regardless of the size of their community, their geographic location, their age, education, or where they work. SWIFT is also designed to address gaps in mobile coverage and capacity throughout the Region by subsidizing fibre optic connectivity to mobile towers necessary to enable LTE/5G. SWIFT funding will also subsidize fibre to the cabinet, fibre to the node, and fibre to the tower to enable shorter-term broadband upgrades necessary to enable VDSL, Docsis 3.1 and higher bandwidth fixed wireless connectivity.

2. On behalf of the nearly 3.5 million residents, businesses, and public-sector entities working together to bring next generation connectivity to our Region, we were therefore pleased to see the Commission has recognized broadband Internet access as a basic service under the *Telecommunications Act*. Ontarians have long considered broadband as an essential utility and communities in our Region have banded together to develop SWIFT to help improve access to high-quality and affordable Internet in an equitable manner. It is therefore encouraging to see a partial alignment of the federal regulatory framework with the needs and demands of Canadians that live and work in relatively high-cost rural and remote communities prone to market failures in the provision of public broadband infrastructure.

3. This intervention and recommendations it provides are based on our experience and are intended to ensure underserved communities in our Region can access any available funds on an equitable basis.

4. The proposed funding regime under development in this proceeding has the potential to complement our Regions' efforts to extend fibre transport and access facilities deeper into the rural edges of the Region over the next 20 to 25 years. It could also accelerate our efforts to address mobile coverage and capacity gaps in parts of the Region where private sector incentives to do so is likely to remain limited.

5. In order to complement efforts by local governments and communities who are already taking the lead in improving connectivity that is available to them, it will be critical for the design of the new funding regime to centralize local accountability and control along all stages of the process (i.e. gap identification, project design, ex post monitoring and performance verification). Simply subsidizing service providers without community input and oversight, and then not monitoring

what they deliver in return for public subsidies has been one of the critical shortcomings of previous federal rural funding programs. We urge the Commission to learn from errors of the past in developing its new funding regime.

6. Given the diversity of underserved communities the fund is intended to target across Canada, we submit it will also be critical for eligibility and assessment criteria to be sufficiently open and to maintain significant flexibility in the design of funding envelopes. The fund should be designed such that it encourages communities and service providers to work together to come up with innovative and cost effective local solutions that enable deploying scalable next generation networks, rather than as an instrument that entrenches old technologies of incumbent operators. To maximize return on investment and private sector capital contributions the Commission should prioritize subsidizing only long-term network assets that can be shared among multiple operators, such as open access transport facilities, towers for mobile and fixed wireless, and fibre access networks.

7. We address the Commission's preliminary views and specific questions in this intervention with the objective of contributing to the development of an open and efficient funding regime. Our views are preliminary and we reserve the right to adjust them in the subsequent stages of the proceeding.

I. Preliminary Comments

9. **What is SWIFT:** SouthWestern Integrated Fibre Technology (SWIFT) Inc. is an initiative by the Western Ontario Warden's Caucus (WOWC) and various other communities in Southwestern Ontario and Niagara Region (the Region) designed to ensure everybody in the Region has equitable access to high-quality and affordable broadband Internet connectivity by 2040.[1] SWIFT represents the combined connectivity interests of 15 rural upper and single tier municipalities in southwestern Ontario, as well as the Region of Waterloo, Town of Caledon, City of Orillia, and the Niagara Region.

10. **SWIFT history and future:** SWIFT has emerged as a Regional strategy to improve broadband infrastructure available to our communities from almost a decade of collective action by Western Ontarians, extensive consultations with user groups and operators, and thanks to funding from all levels of government. Starting with growing concerns on the rural edges of the Region by family farmers in the mid 2000s about the limitations poor Internet connectivity places on their ability to innovate by adopting advanced agricultural technologies[2], other stakeholders in both rural and urban parts of the Region have increasingly highlighted challenges a lack of access to high-quality and affordable connectivity places on their capacity for social and economic participation, adoption of cloud-based applications and services, and competing with other regions of Canada and globally. In response, Regional stakeholders have prioritized future proofing the Region's broadband infrastructure by deploying advanced fibre transport and access facilities as an economic development priority and created SWIFT as a long-term infrastructure plan for achieving this objective over the next 20-25 years. Leveraging nearly $300 million in initial capital expenditures from all three levels of government and private sector partners, SWIFT aims to stimulate around $1 billion in additional public and private investments into the Region's broadband infrastructure over the next 2 decades.

11. **SWIFT design:** As a long-term infrastructure development plan, SWIFT design can be decomposed in two stages. We are currently engaged in a Request for Proposal (RFP) process to select appropriate private partners for deploying SWIFT's core transport network to serve nearly 350 communities covering 3.5 million Ontarians (or nearly 10% of Canada's population in an area covering some 45,000 square kilometres) with open access Points of Presence (POPs). We plan to roll out the backbone, middle-mile and last-mile elements of SWIFT over the next 3-5 years, which will be deployed and operated by private sector partners we are currently selecting via the RFP process. In the second stage of the plan, SWIFT will retain a small proportion of revenues from traffic on the Regional network (~1-3%) for the Southwestern Ontario Broadband

[1] For further details see: http://swiftnetwork.ca/ and www.wowc.ca

[2] Hambly, H., Fitzsimons, J. Pant, L. & Sykanda, P. (2007). Innovations in Farm Families and Rural Communities: Capacity Development for Broadband Use in Southern Ontario. University of Guelph. Available at: http://swiftnetwork.ca/Rural_Broadband-final_paper.pdf

Development Fund (BDF) to cross-subsidize development of next generation fibre-to-the-premises (FTTP) and fixed mobile network assets in high-cost rural and remote communities prone to underinvestment and market failures. In this context, SWIFT can be seen as both an integrated Regional network improvement plan that aggregates demand for next generation broadband technologies and a dedicated financing vehicle for stimulating further investment required to ensure relatively high-cost/low-revenue parts of the Region do not fall further behind in terms of broadband quality and affordability.

12. **SWIFT guiding principles:** Members of SWIFT have developed the network based on a set of core principles, which we submit are relevant to consider in the context of this proceeding as the Commission contemplates the design of its broadband funding regime:[3]

    - Standards-based architecture: the system will interoperate with all other systems and will be easy to support;
    - High availability and scalability: SWIFT will be available at any moment in time, whenever users need it and it will scale to tens of millions of user connections and applications dynamically without requiring any additional capital outlays or causing system delays;
    - Neutrality and open access: there will be no barriers to entry for users and providers to access the network, levelling the playing field and ensuring that contractual mechanisms and oversight are in place to ensure the network is open and accessible to all;
    - Ubiquity and equitability: the network will be physical accessible to everyone and everyone will face the same costs to provide applications and services over the system or use applications and services on the system, regardless of geographic point of ingress/egress;
    - Competition and affordability: SWIFT will promote competition in services and applications over by providing open access, flat-rates, high-availability, and a differentiated system that is affordable to users regardless of population density;
    - Broad public-sector user participation: SWIFT has received broad public sector support from county level and municipal governments, post-secondary educational institutions, health care institutions, broadband networks, and other 'MUSH' sector organizations. The support of all OPS/BPS users is critical, as these organizations are 'anchor tenants' to the system and create the underlying foundation that makes it feasible to extend service to private enterprises, small and medium sized business, farmers and residents;
    - Sustainability: all users will pay fees to access the network, which will be published and publicly available to ensure transparency. These fees will provide the cash flow

[3] Intelligent Communities Forum Canada (ICF Canada) ICF Canada has adopted similar principles as SWIFT in it's CRTC position paper, which argues for broadband to be considered a basic utility and makes the case for widespread fibre diffusion as key to enabling Canada's competitiveness in the digital economy.

sustainability required to support ongoing operating and capital costs, and ensure that the network will not be dependent on taxpayer subsidies in the future.

13. **Program design:** Western Ontarians have significant experience with previous broadband funding initiatives by the federal government. In our experience models that pit underserved communities against each other to compete for scarce funds from higher levels of government lead to the creation of inequities between rural communities. Furthermore, programs which have bypassed community participation and instead allocated subsidies directly to service providers who make upgrades to legacy technologies that are expensive to scale to demand growth (or are unscalable), and perpetuate the legacy trap rural communities find themselves caught in. As well, there is often little or no ex post performance monitoring or research on results.

14. At the same time, the Commission's unwillingness to adopt wholesale access obligations with respect to fibre transport facilities continues to pose a substantive barrier to the ability of rural communities to improve connectivity and to achieve higher productivity and value in key sectors such as agriculture and food.[4] We know from our own research that there are vast areas of our region where there is only one transport service provider. Furthermore, we submit that for the success of the new funding regime it will be critical to impose open access obligations on fibre transport and access facilities that are going to be subsidized. Long term dark fibre Indefeasible Rights of Use (IRU) arrangements between local communities and incumbent rural transport providers should be eligible for the funding regime as levering them would represent a potentially cost effective way of improving speeds and reducing prices in rural communities and small towns where there are no competitive options available. In addition, allocating scarce public funds to upgrading legacy copper based technologies or expensive satellite access services is not only wasteful, but can have negative implications on competition and affordability in underserved communities the Commission's new funding regime is intended to target.[5]

15. **Regulatory progress:** We were pleased to see that in the Telecom Regulatory Policy 2016-496 the Commission listened to calls from rural communities from across the country and has

[4] Hambly, H. & Chowdury, M. (2016). Role of Broadband Internet Connectivity in the Adoption of Precision Agriculture Technologies. Report prepared for Agriculture and Agri-Food Canada, Service Contract #01B68-16-0103.

[5] Satellite backhaul/transport services are however critical for very remote communities and should be subsidized where deploying fibre transport is not feasible or will end up being more expensive on a capacity adjusted bases in the very long term. The size of the CRTC fund is likely to be too small to accommodate this need and additional funds from the federal government will be needed to improve connectivity in remote communities and the North. Given that there are a range of satellite systems being developed and deployed in the next few years, it might also be relevant for the CRTC and ISED to consider instead of providing supply side subsidies to any one satellite provider, it uses demand side subsidies (e.g. a voucher) that enables low income users that live in remote communities to purchase services from competing satellite providers, some of whom appeared before the Commission in the CRTC 2015-134 proceeding that led to the CRTC 2016-496 decision.

prioritized scalability, Quality of Service (QoS),[6] transport access, and mobile network assets in the design of the proposed funding regime as outlined in the Notice of Consultation for this proceeding. These new universal service policy priorities are consistent with SWIFT principles noted above and will enhance the effectiveness of the new CRTC funding regime.

16. **Federal standards and Canadian federalism:** In addition to the results of this proceeding, we look forward to reviewing the Commission's new minimum QoS standards that are being developed pursuant to the CRTC 2016-496 basic service decision. We urge the Commission to set these proposed standards such that they encourage communities and network operators to identify and proactively address emerging gaps in service quality (where demand for network resources is outpacing capacity supply). If minimum speed and quality of service standards the Commission adopts are too low however, they could start to conflict with decentralized initiatives such as SWIFT where local communities are trying to achieve standards that might be higher than the national minimums.[7] In developing different elements of its new broadband funding regime, we urge the Commission to consider the interplay between its decisions and efforts by lower levels of government and "community intermediary organizations" who have already recognized the role broadband plays as an essential utility and taking the lead to ensure their communities have access to a "world-class" broadband infrastructure sooner than later.

17. **Diversity and experimentation:** Given the expected size of the proposed CRTC funding regime relative to the extent of the rural-urban broadband divide at the national level (as identified by various parties that led to the CRTC 2016-496 decision), demand for its funds from underserved communities is likely to be extensive. Unless standards of eligibility are highly restrictive (e.g. not open to bottom-up community led initiatives), the Commission should therefore expect its fund to be highly oversubscribed; much like the recent Connect to Innovate (CTI) program. However, adopting relatively restrictive eligibility criteria would create equitability concerns and limit the scope for the emergence of innovative and cost-effective community led initiatives in small towns and rural regions of the Canada prone to market failures. This includes various rural and remote communities in our Region that work together through SWIFT. We therefore submit that, at least for the first few years, it would be prudent for the Commission to consider allowing for significant openness and flexibility in the type of community led initiatives it will enable the

[6] It is important to note that delivering QoS on legacy broadband technologies may not be feasible, which is another reason why any subsidies should be targeted at deploying highly scalable fibre and other types of long lasting and sharable network assets that would inefficient to duplicate (e.g. mobile towers). SWIFT guiding principles prioritize QoS considerations by recognizing that reliable utilization of multiple applications by multiple users requires networks that can be scaled in real time to deliver multiple classes of services simultaneously. SWIFT's guiding principles define QoS as a critical "measure of the performance and availability of the system such that the network is available to users whenever they need it."

[7] For instance, subsidizing private sector operators to upgrade legacy copper or fixed wireless services in a town where a private or public operators is contemplating deploying fibre will reduce the expected take-up rate for the new technology.

independent administrators to considers; as well as in the design of funding envelopes the administrator allocates to complement funding from lower levels of government and our private sector partners. Due to their diverse needs, we suspect adopting a very formulaic one-size-fits-all approach could lead to scarce funds being allocated to projects that do not meet local needs and do not encourage innovation.

18. To insure against aggregate program level risks, the Commission should initially allocate relatively small contributions to a large number of relatively small network improvement projects (i.e. community based initiatives on the rural edges of the network where the business case to serve may not be there, even with substantial public subsidies; e.g. as in provincial strategies in British Columbia and Alberta on the edges of the SuperNet).[8] After a couple of years as it becomes more apparent to the administrator and the Commission what works and what doesn't work, then the Commission should review the experience and direct the administrator to make adjustments to eligibility and project assessment it considers appropriate based on data from the first call for proposals and project outcome indicators (e.g. cost per household, improvements in measured speeds/reduction in latency).

19. **Other strategies:** Alternatively, the funding mechanism can be designed to make small contributions to larger locally, regionally, or provincially led initiatives already aggregating demand and investing in advanced networks such as SWIFT in Southwestern Ontario or that of our colleagues from the Eastern Ontario Warden's Caucus (EOWC)/Eastern Ontario Regional Network (EORN). Rather than adopting one wholistic approach, the Commission can also segment the proposed fund into two or more tranches as appropriate for balancing competing considerations involved in different program design strategies (i.e. a few larger projects and many small ones on an annual basis as funds become available, plus potentially segmenting a portion of the fund to support broadband mapping and engineering studies needed to develop efficient and innovative local broadband improvement initiatives by small communities with limited internal resources).

20. **Contract design and performance monitoring:** We submit that one key shortcoming in the design of previous federal rural subsidy programs has been a lack of emphasis on contractually binding minimum service performance standards and too much reliance on headline "best effort" download speeds (i.e. up to xMbps). This problem is well known in the rural broadband community. As our colleagues from the Eastern Ontario Warden's Caucus (EOWC)/Eastern Ontario Regional Network (EORN) highlighted in the CRTC 2015-134, moving towards a program design approach that includes hard contractual performance targets and minimum QoS standards is needed to address this problem. This Notice of Consultation does not address if the

[8] Rajabiun, R., & Middleton, C. (2013). Rural Broadband Development in Canada's Provinces: An Overview of Policy Approaches. *Special issue]. The Journal of Rural and Community Development, 8*(2), 7-22. Available at: http://journals.brandonu.ca/jrcd/article/view/1004/231

proposed administrator, or any other entity, will be responsible for ex post performance monitoring of the measured speeds and QoS metrics of projects that are to be funded. It will be critical to address this problem in the development of the regime or to develop a monitoring mechanism centrally at the CRTC or ISED (e.g. which can cover not only this, but also the performance of private partners in other federal broadband subsidy mechanisms such as CTI). User driven performance testing should be utilized to validate actual performance level operators receiving subsidies are delivering and if they are meeting minimum speed/QoS standards they promised to deliver in return for public funds. We urge the Commission to consider the importance of hard contractual performance targets, ex post performance monitoring, and the possibility of contractual penalties in order to minimize the scope for non-performance that has plagued many previous federal funding program design strategies.

21. **Objective of this intervention:** We are participating in this proceeding because the Commission's new broadband funding model has the potential to complement investments SWIFT will be making over the next 20 years in order to extend fibre and advanced LTE/5G mobile networks deeper into relatively high cost rural and remote communities in the Region. We also want to mitigate the risk that the new funding regime will again create a situation in which underserved communities are pitted against each other and forced to compete for scarce public funds, rather than developing scalable regional solutions designed to meet their long-term infrastructure needs. In short, we urge the Commission to build on its renewed commitment to connectivity in rural Canada stated per TNC 2016-496 and design the funding regime in a manner that empowers consumers and is open to small rural and remote communities who are already taking the lead to improve broadband quality, affordability, and equitable access to the Internet for every Canadian.

22. This intervention represents SWIFT's preliminary views in this matter. We reserve the right to adjust our position and recommendations in subsequent submissions to this proceeding.

II. Responses to questions for discussion in this proceeding

Part I: Comments re preliminary view of the Commission re eligibility and assessment criteria Appendix 1 of TNC 2017-112

Eligibility criteria

23. **Eligible recipients:** SWIFT supports the preliminary view of the Commission regarding the eligibility of provincial, territorial, regional, municipal, and First Nations entities, as well as those of non-profit entities that already operate or intend to operate broadband infrastructure. We also agree that individuals and federal entities should not be eligible. However, SWIFT is concerned about the view of the Commission about the eligibility of private sector operators to apply directly to receive funding from the mechanism. There are two key reasons for this:

    - First, making private operators eligible will create a high-degree of interaction between industry and the independent administrator, creating the potential for large operators contributing to the fund to shape its conceptualization of what works or does not, what technologies and standards of service are appropriate, and the manner in which subsidy recipients will be held accountable for what they deliver ex post.
    - Second, making private operators eligible to apply directly for the subsidies would enable them to bypass local and regional engagement in gap identification, project design, technology/provider choice and service standards. As has been the experience with previous programs such as Connecting Canadians that bypassed local democratic participation and accountability, this can lead to the development of projects that do not necessarily fit local needs and conditions, are unsustainable due to a lack of hard contractual performance targets and ex post monitoring by users and public authorities in underserved communities.

24. Even if operators cannot directly apply for the funds, they will be the ones that ultimately receive much of the available funds from this and complementary financing vehicles to deploy scalable technologies and deliver higher speed/quality services. Allowing operators to directly apply for the new funding mechanisms can discourage private companies to work with local communities to develop effective solutions that meet local needs and standards. The design of the ISED's recent Connect to Innovate (CTI) program appears to have recognized this key problem with previous federal programs that bypassed community input and accountability.

25. We therefore urge the Commission to learn from the mistakes of the past in this regard and build on the community centric approach ISED adopted in the CTI design by revising its preliminary position regarding the eligibility of private companies to directly apply to the funding regime. By excluding their direct applications, the Commission would actually be encouraging the private

sector to work with local and regional government and non-profit community intermediaries to aggregate demand and can hold service providers accountable for the quality of services they ultimately deliver in targeted communities.

26. **Eligible costs; terrestrial component:** SWIFT is generally of the view that only network assets with a long lifespan that can be shared among multiple operators should be eligible for receiving scarce public funds. Nevertheless, we recognize that the fund can be of great benefit to many small and remote communities with limited resources if it would include costs associated with activities such as engineering and design, environmental scans and assessment. Broadband service benchmarking and detailed mapping represents a key first element in developing municipal and regional broadband strategies and scalable solutions for addressing them through localized cross-subsidy mechanisms (e.g. higher population density town or village core supporting users on the suburban/rural edges of the local network). We therefore support the Commission's preliminary view about the eligibility of initial engineering and mapping exercise.

27. We in fact would like to go further and recommend that a detailed network mapping exercise that captures the state of the network in underserved communities should be a precondition for eligibility to apply for the proposed funding regime. To support efforts in communities who lack the resources to finance engineering and broadband mapping studies, we recommend the Commission directs the administrator of the fund to allocate a specific proportion to his class of projects. Only after local communities have validated the state of networks that are available to them, develop relevant policy and technology options, and engage in consultations with their stakeholders, they would be really ready to start engaging with private operators and higher levels of the government to come up with an effective project design that leverages scarce public funds to promote further private investment in broadband infrastructure capacity in that community. Furthermore, background studies that go into effective network design should be conducted independently of service providers and must therefore be separated from the part of the fund that will subsidize fixed network asset deployments.

28. With respect to the terrestrial component of the fund, we submit that the range of eligible costs is too broad. Given that the Commission is designing this funding regime as a complement to broader efforts by local, regional, and provincial governments, and that the size of the proposed CRTC funds is not that large given the scale of Canada's rural-urban broadband divide, we submit that the list of examples in the Appendix 1 is too inclusive to be efficient and effective. Assets such as fibre-optic cable (including long term fibre Indefeasible Right of Use (IRU) agreements to procuring affordable transport capacity by rural communities), mobile towers, poles, shelters, and enclosures are long lasting and can be shared among multiple operators, which we submit should be eligible. Servers, switching, and other equipment tends to have a short lifespan and are available from a multiplicity of sellers in the global marketplace. Making this second class of network assets eligible for subsidies creates significant risk to the public

sector and can lead to inefficient choices by operators or local government/community entities leading broadband infrastructure initiatives. For community owned and operated networks where there is limited private participation, particularly in small and remote communities, we would support funding server and switching facilities. However, in public-private partnership such as SWIFT it might be more prudent to let private sector providers make the relevant choices and take on risk associated with the selection of assets with a relatively short lifespan and instead allocate scarce capital resources to long lived assets that help future proof the network.

29. We are concerned about the specific language regarding "network broadband connectivity devices including upgrades and adaptations". We understand that perfectly reasonable upgrades and adaptations exist that may help marginally enhance the capacity/speeds of legacy infrastructure, but oppose any further public investments that encourage service providers to extend the life of long loop copper/DSL. Public policy should be encouraging operators to decommission these old networks and deploy next generation fibre networks, not the other way around. While there are a wide range of technological enhancements available for increasing headline download speeds on these legacy networks (e.g. G.Fast, various types of DSL range extenders, etc.), their range and ability to offer reliable and symmetric connectivity is limited. This is one reason why large operators in both Canada and the U.S. have shunned adopting these technologies (versus U.K and Germany for example where G.Fast and other DSL speed enhancements have been adopted by the incumbents).[9] As a short term solution, upgrades to legacy copper-based technologies may appear more cost effective than scalable next generation fixed fibre and 4G+ mobile networks.

30. In the longer term however, any such public or private capital expenditures represent a pure waste of scarce capital resources available for improving connectivity. This is particularly the case in rural communities where aging copper plants have not yet been upgraded, to the extent that even fixed voice quality over legacy pain old copper telephone networks is beginning to deteriorate. Decommissioning old copper plants and replacing them with scalable fibre infrastructure can generate significant gains in terms of capacity improvements and service quality for rural customers, but is beneficial to private sector providers also as fibre has lower costs to maintain and generates higher revenues relative to legacy copper, fixed wireless, or satellite. The experience of Bell Aliant in Atlantic Canada where it decided that it would be cheaper to move directly from DSL to fibre-to-the-premises (FTTP) (i.e. versus upgrading legacy DSL to improve headline download speeds), lends significant support to our recommendation that projects that propose upgrades to legacy technologies should not be eligible to receive funding from the Commission's new funding regime.[10]

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[9] Rajabiun, R. & Middleton, C. Regulatory Federalism and Broadband Divergence: Europe in the Making of Canadian Telecom Policy. *Intereconomics*, forthcoming (2017).

[10] See RBC Capital Markets, Telecom Scenario Report, 19 August 2015. According information in this report by one of the large institutional investors in Canada's broadband infrastructure, fibre pass through costs of Bell Aliant

31. **Eligible costs; satellite component:** There are many satellite-dependent communities and user in our Region, to which SWIFT is designed to extend transport and middle mile facilities. Further supply side subsidies to resellers of satellite retail services would counteract efforts by community intermediary organizations who are aggregating demand to bring next generation connectivity to these communities. One reason for this is that satellite services that are underpriced reduce the expected take-up rates of more scalable and future proof technologies by local communities. In addition, there are a number of proposed new high-capacity satellite systems (as well as balloon and drone-based broadband systems) that are currently looking for financing and their proponents claim will become operational over the next 5 to 10 years. In the context of prospective competition in this sphere, allocating scarce public funds to one particular satellite provider or another would be highly inefficient and creates significant technological lock-in risks for remote communities. A demand-side subsidy strategy (such as a voucher for low-income individuals in remote communities and the North) represents a more efficient approach in satellite dependent communities as it will be more likely to allow consumers to take advantage of emerging technologies designed to improve connectivity precisely in this class of communities and to users in very low-density areas where the costs of deploying fibre would be exorbitant.[11]

32. Nevertheless, we recognize that extending fibre transport facilities to some very remote communities may not be economically feasible. While we oppose eligibility of decentralized satellite based access services, for very remote communities satellite transport services should be eligible for receiving funding from the Commission's proposed broadband cross-subsidy facility. In this class of communities, availability of affordable satellite transport capacity is a critical component for the development of local fixed and wireless networks that extend basic Internet access services to the entire community in a cost-effective manner. For users who are far away from core areas of satellite based communities, we support using demand side subsidies that reach a large number of low-income users that live in these communities and enable them to select among competing providers of high-capacity satellite broadband services on the horizon.

Assessment criteria

33. **Minimizing overlap:** As note in SWIFT's preliminary comments above, one of our objectives is minimize the potential for the Commission's new funding regime to counteract our efforts to

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in Atlantic Canada ranged from around $400 per household to over $600 for rural ones, with the final FTTP "drop" into the home at around $1,000 per household. qos
A DSL speed enhancer/extender or upgrade might have lower fixed costs ($200-$1000, depending on technology), but are ultimately not scalable to growing demand and converged triple/quadruple play services relative to FTTP. Their range is also limited, which makes them particularly inappropriate for rural communities.

[11] Rajabiun, R., Ellis, D., & Middleton, C. (2016). Affordability of Communications Services. Available at: http://www.broadbandresearch.ca/ourresearch/lit-review-for-crtc-2016-affordability-rajabiun-ellis-middleton.pdf

extend access to ultra-high capacity fibre networks on an equitable basis in our Region. This is one of the reasons we recommend excluding private service providers from applying directly to receive any funds and place such a heavy emphasis on the importance of local community engagement and accountability in this submission. We therefore agree with the preliminary view of the Commission that the program design should try to minimize the potential for "overlap" with initiatives led by lower levels of government such as SWIFT.

34. **The "overbuilding" problem:** On the other hand, we are disappointed to see in its preliminary views the Commission states that it will assess projects with the aim of minimizing "overbuild". Given that connectivity via legacy copper plants and slow/high latency satellites is already ubiquitous, communities from around the country demand projects such as SWIFT that are intentionally designed to "overbuild" legacy broadband technologies with scalable new ones. In the longer term in rural communities, it is imperative to "overbuild" legacy long-loop DSL, fixed wireless, and satellite services with next generation fibre and mobile networks. SWIFT therefore strongly disagrees that "overbuilding" low-capacity/high legacy assets of one operator or another should be incorporated in the assessment criteria for the funds. To help improve connectivity in rural and remote communities via its new funding regime, we submit the Commission should instead try to promote "overbuilding" non-scalable legacy technologies with scalable new ones as much as possible. Prioritizing public investments in fixed network assets that can be shared by multiple over-the-top (OTT) service providers, such as high-capacity fibre transport/middle facilities and mobile towers will help minimize potential concerns by incumbents about "overbuilding" their legacy assets.

SWIFT position on specific assessment criteria:

35. **Speeds:** Technologies that offer more symmetric speeds (both upload and download) should be prioritized over those that offer relatively fast headline download speeds. This is critical for the ability of users to deploy advanced applications and services that require going back and forth to the so-called "cloud" for analytic purposes such as precision agriculture and other Internet of Things (IoT) applications where information processing and analytics take place elsewhere. More symmetric connectivity via both fixed and mobile networks is particularly relevant for rural communities to enable the deliver of other public goods for which lower levels of government such as education, healthcare, and emergency services.

36. In contrast to past programs that defined speeds in terms of headline advertised rates by operators (up to xMbps), the Commission should require applicants to define "speeds" as actual minimum sustained speeds. It should also require any party receiving funds to specify the approach they will use to measure and validate the speeds and QoS metrics they deliver in return to subsidies from the CRTC fund.

37. **Capacity:** Unlike the concept of speeds operators advertise, maximum theoretical capacity offers a more informative indicator for assessing proposed projects and would be consistent with SWIFT principles of rewarding scalability (versus upgrading legacy assets that are expensive to scale in response to demand growth). "Overbuilding" low capacity/high latency legacy assets with ultra-high capacity next generation networks will be critical for the effectiveness of this funding regime in improving connectivity across Canada's diverse regions and minimizing its potential to counteract local efforts to ensure equitable access to a world-class digital infrastructure.

38. **Quality of Service (QoS):** Pursuant to CRTC TNC 2016-496 determination regarding the importance of QoS standards, we submit that the willingness of project proponents to guarantee a minimum QoS level (particularly in terms of latency as measured by Round-Trip-Time (RTT)) should be considered as part of eligibility criteria for the proposed funding regime. In terms of minimum QoS standards for eligibility, those submitted by our colleagues from the Eastern Ontario Wardens' Caucus (WOWC)/Eastern Ontario Regional Network (EORN) in the CRTC 2015-551 proceeding would be reasonable - **50 milliseconds for fixed and 100 milliseconds for mobile**.[12] Proposals and technologies with expected average latency rates higher than these should not be subsidized, while those that enable the delivery of multiple classes of services, including those with QoS guarantees, should be encouraged and prioritized. This is particularly important for the capacity of industries such as agriculture and food to deploy advanced applications designed for their needs.[13]

39. **Public v. private investment:** It would be possible to prioritize projects with higher proportion of financial contributions from the private sector in order to minimize per project public expenditures and reach a wider range of underserved communities with the funding regime. However, prioritizing public or private investments ex ante may not be prudent because of the diversity of underserved communities across the country. Due to this diversity, the optimal project design can vary. For instance, in very-high cost remote communities attracting private investment might be challenging and more public subsidies may be required than in a more densely populated small town with relatively low cost to upgrading the access network on a per household basis (once affordable fibre transport facilities are provisioned).

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[12] Response to interrogatories from EOWC/EORN to interrogatories from Rogers Regarding CRTC *Review of Basic Telecommunications Services* Telecom Notice of Consultation CRTC 2015-134, 9 April 2015, and CRTC 2015-134-1, 3 June 2015. September 10, 2015.

[13] For instance legacy technologies are simply not going to work in terms of QoS for precision agriculture. Deploying next generation fibre connections to farms is required for enabling farmers to take advantage of the wide range of innovative cloud-based applications available for improve agricultural productivity and the efficiency of food distribution into Canada's urban centres and into global markets. See Hambly, H. & Chowdury, M. (2016). Role of Broadband Internet Connectivity in the Adoption of Precision Agriculture Technologies. Report prepared for Agriculture and Agri-Food Canada, Service Contract #01B68-16-0103.

40. **Scalability:** SWIFT supports the preliminary views of the Commission regarding scalability and is pleased the Commission has prioritized it.

41. **Wholesale access:** Wholesale access obligations that enable third party entities (e.g. other service providers, large organizations such as schools, hospitals) to interconnect with publicly subsidized networks should be viewed as a requirement for eligibility for the funding regime. This is a particularly important requirement to have in higher-cost communities as it will encourage cooperation and risk sharing among operators and with public sector users. Anticipated wholesale pricing approach and the degree by which it is expected to improve affordability of services in a targeted community should be a critical consideration is assessing proposals (e.g. fibre transport pricing, mobile tower access rates, etc.).

42. **Cost per household v. sustainability**: In determining how to incorporate costs in the assessment criteria, we note that in the short term it is generally cheaper to upgrade legacy technologies such as long loop DSL and fixed wireless than to deploy advanced FTTP and mobile networks.[14] However, in the medium to long term these legacy platforms are more expensive to scale to growing demand and allocating scarce public funds to them would not lead to sustained growth in speeds/service quality levels compared to deploying next generation technologies requiring higher initial capital outlays. SWIFT is built on the collective decision by stakeholders in Southwestern Ontario that scalability, sustainability, and future proofing with fibre are necessary for economic development and global competitiveness of our Region. We suspect most other rural communities from around the country would agree with this. We highly recommend the assessment criteria provides greater weight on scalability, sustainability, and minimum QoS standards in projects that it selects than trying to minimize project cost by allocating public funds to make cheap upgrades to legacy platforms that have to be decommissioned sooner than later.

43. **Pricing:** Although wholesale pricing issues should be addressed in project assessment, we think incorporating retail market pricing in the assessment criteria can make it increasingly complex and cumbersome to administer. Prioritizing pricing also can counteract other noted priorities by the Commission by creating perverse incentives for incumbents to overinvest in relatively low cost/cheap upgrades to legacy assets using the funds (particularly if they are allowed to/considered eligible to apply to the fund directly) and underinvest in scalable technologies and assets with a longer lifespan.

[14] See note 9 above.

Project management function

44. **Administrative independence:** SWIFT support the preliminary position of the Commission to ensure full independence of the administrator from any recipients of the broadband fund. This is particularly the case if the Commission maintains its preliminary view that service providers should be eligible for applying for the funds independently and thereby bypassing community consultations in project design and accountability in terms of service delivery.

45. **Fairness monitor:** It is not clear from the Notice of Consultation what the mandate and authority of the proposed "fairness monitor" will be in the Commission's funding regime. Nevertheless, we see potential risks with the preliminary position of the Commission stating that the independent administrator is to co-operate fully with the so-called fairness monitor engaged by the Commission. In our experience, the concept of fairness in rural broadband program development is closely associated with fears of incumbent operators about "overbuilding" their legacy assets with new high-capacity technologies that can offer faster speeds at lower prices. If operators can influence project design and selection by the independent administrator through the fairness monitor, that could have a detrimental effect on the efficiency and equity in translating the funds into sustainable network improvements. On the other hand, if the mandate of the fairness monitor is to advocate for consumers and small remote communities with limited resources to engage with the administrator of the fund, we would support it as a facilitator that helps promote equitable access. Nevertheless, we submit that project selection should be based on concrete technical and financial assessment criteria and requiring the independent administrator to fully co-operate with a fairness monitor opens the door for moving from concrete assessment criteria to a "beauty contest" that invites arbitrariness and undue influence from powerful interest seeking public subsidies available through the fund.

46. While we recognize that it may not be "fair" to incumbents to "overbuild" their legacy long-loop DSL and fixed wireless networks with fibre and advanced mobile technologies, it also would not be fair to users to have to rely on old and slow legacy technologies that do not adequately meet their needs or are unaffordable. Fairness is an extremely subjective concept with the potential for being abused in a manner that essentially overrides assessment criteria the Commission ultimately specifies at the end of this proceeding for the independent administrator to implement. If the Commission will be monitoring and approving projects based on recommendations by the administrator, then we don't really see the need for an ill-defined fairness monitor with the discretion to shape the regime the Commission has already determined should be administered by an entity that is independent of parties applying to receive the funds. We reserve the right to comment further on this issue once it become clearer what other parties in this proceeding think of the potential role of the proposed fairness monitor, but our preliminary view is that it would be more efficient for the Commission itself to be accountable for any functions that it is thinking of delegating to this fairness monitor.

47. **Program evaluation:** The independent administrator should not evaluate its own performance and this task should be allocated to third party independent experts in infrastructure program design. Beside retrospective audited financial statements and annual reporting, the Commission should require the administrator to fully cooperate with a Commission appointed independent evaluator with expertise in infrastructure program delivery who is able to identify emerging problems in the design and application of the funding regime before they arise and to advise the Commission on how to make the necessary adjustments to avoid them.

48. **Ex post project performance monitoring:** Tasks assigned to the administrator do not reference anything about the role the administrator will play in ensuring the performance of counterparties with respect to funding contracts it will award and administers. It is not clear to us if the Commission has other plans with respect to this important element of project success and sustainability, such as doing so internally or cooperating with ISED to adopt a more holistic approach to ensuring that counterparties receiving public subsidies meet minimum quality of service standards the Commission is currently developing. At SWIFT, we are currently developing a GIS based system that enables us to monitor network performance in a fine-grained manner across the Region in order to ensure counterparty performance in access delivery and to target our future investments in an efficient manner to communities that are falling behind. Developing strategic alliances with public research universities, such as that of SWIFT with the Regional and Rural Broadband (R2B2) at the University of Guelph or the University of Alberta partnership with he First Mile Connectivity Consortium (FMCC), can also enhance performance monitoring capacity and data stewardship.

49. Given our experience with previous federal last mile only subsidy programs that lacked any ex post performance monitoring, we strongly recommend the Commission and ISED consider how they are going to monitor the performance of various broadband funding mechanisms they are implementing. The need to adopt these new programs is itself partly a response to failures of past policies and programs in closing coverage and capacity gaps in rural and remote communities in a sustainable manner. We submit that a lack of ex post monitoring capacity at the federal level will create significant risks to program effectiveness as it only encourages non-performance by private sector counterparties that will ultimately receive the funds (either directly from the administrator, or through lower levels of government and initiatives such as SWIFT and EORN through which rural communities work together).

50. **Accounting function:** We agree with the Commission's preliminary views regarding the accounting function of the administrator. Nevertheless, it is relevant to note that these functions are standardized and might be handled best by an external accounting firm with experience in serving large organizations. In terms of functional specialization and efficiency, it might be prudent to let the independent administrator specialize in efficient broadband project evaluation

and delivery by outsourcing more mundane/standardized accounting functions to an accounting firm.

Part II: Questions for discussion in this proceeding Appendix 2 of TNC 2017-112

Roles of the Commission and the third-party administrator(s)

Should additional roles and responsibilities be considered for each entity?
Is there a need to amend or eliminate certain roles or responsibilities?

51. For reasons outlined above, the Commission should take on roles and responsibilities it plans to outsource to a poorly defined "fairness monitor". Regardless of the exact mandate of this entity, introducing it into the picture creates substantive ambiguity about the allocation of responsibility and accountability. It would also introduces new and opaque channel through which powerful private interest can undermine efficient administration of the funding regime. To ensure transparency and accountability, we submit that it would be prudent to limit potential interference from this proposed entity on technologically sound and economically sustainable program design based on the merits of proposals. The independent administrator should not be required to "fully co-operate" with the fairness monitor as that would detract from its independence.

52. Although we do not take a position on who should do so, for the reasons noted above it will be critical for somebody at the federal level to collect data on actual speeds and service quality levels at the project level to ensure compliance with performance targets that will be specified in funding contracts with private providers or public networks (e.g. municipal, non-profits) and the Commission's minimum universal service speed/service quality standards. In the absence of public sector capacity to monitor and hold accountable those receiving funds for service performance they deliver, operators serving high-cost communities are likely to continue to under-provision capacity (relative to speeds they advertise) as there is little competition and the business case for meeting user expectations of advertised rates is relatively weak.

Governance structure of the third-party administrator(s)

Should there be a single administrator/board or separate administrators/boards for each of the fund's two functions (project management and accounting)?

53. A single administrator with one board is likely to be more accountable than creating two boards, particularly since the Commission is already planning to maintain an adequate level of oversight over the administrator. Given the highly-technical and specialized knowledge that is required for

evaluating proposed projects and allocating funds in an efficient and equitable manner, it might nevertheless be prudent to let the administrator specialize in this class of functions (and potentially ex post monitoring of project performance) and simply outsource the more standardized/routine accounting functions by procuring them on the open market from an accounting firm serving large organizations and with experience working with the public sector.

Describe the composition of the board(s). For example, would the Canadian Telecommunications Contribution Consortium Inc. (CTCC) be an appropriate choice for the accounting function? How should board members be selected?

54. As detailed above, we agree with the preliminary view of the Commission that the administrator should be independent from private companies that will ultimately be receiving the funds, either directly or through lower levels of government/community organizations aggregating demand. The Commission should be responsible for appointing all members of the board of the administrator based on their functional expertise in various areas relating to the administration of the fund and their independence from industry interests in order to help build trust in the funding regime and ensure its success in achieving objectives.

55. In appointing the board members, it would be prudent for the Commission to consult with provincial, territorial and municipal governments, representatives of First Nations and Northern Communities, and other stakeholder groups for whom the success of this funding regime is important. We submit that it would be a grave mistake to set up this funding regime in a manner such as the CCTS where operator interests dominate strategic direction of the organization and support the Commission in developing a truly independent administrator tasked with empirically driven and economically viable decision making.

Accountability and fairness

How should the fairness monitor be selected and what metrics should be used to assess whether they have fulfilled their responsibilities?

For a discussion of our concerns about the role of the fairness monitor in the funding regime, please see above. We will wait for subsequent stages of this proceeding to form our recommendation in this matter.

Should any additional safeguards be put in place to ensure that the broadband fund is operated fairly and efficiently?

56. A board that is appointed by the Commission in consultation with communities that are expected to benefit from the funding regime, exclusion of private sector providers who will ultimately be

receiving the funds for a unified board, and outsourcing of accounting functions should be sufficient to ensure fairness and efficient operation of the fund. Too many safeguards, as well as poorly defined ones such as the fairness monitor, could actually reduce both efficiency and fairness by introducing unnecessary complexity into the process and muddling allocation of accountability between the Commission and the independent fund administrator. Minimizing the complexity of the assessment framework will open the regime to small and remote underserved communities and be key to its fair and efficient operation.

Calls for applications

Taking into consideration the administrative burden on all stakeholders, how frequently should calls for applications be issued?

57. For initial engineering studies and network gap analysis necessary for developing effective project proposals in underserved communities, we submit that it would be prudent to have an open call for a predetermined proportion of the fund in order to support initiatives by smaller rural and remote communities that lack the resources to take this critical first step in coming up with a robust broadband improvement proposal (e.g. 10-20% of the approximately $100 million that is expected to be available in the first few years). The administrative burden of processing such applications is negligible and risks of allocating small grants in this way for underserved communities to better understand their options are small. For reasons outlined in our preliminary comments above, it might be prudent to create a separate tranche for this class of projects in order to support the development of project proposals that meet local needs and conditions (versus a very formulaic top down approach as in Connecting Canadians for example).

58. Allocating a large proportion of the funds available in the next few years using large but infrequent calls for proposals creates substantive risks for the effectiveness and sustainability of the funding mechanism. This is because the optimal balance between competing assessment criteria specified by the Commission is not yet evident and it would be prudent to allow for experimentation and learning on the parts of both the Commission and the independent administrator in this regard. To reduce administrative burden, the Commission should specify relatively simple assessment criteria based on its 50/10 Mbps aspirational speed target, as well as the minimum service quality standards of basic service it is developing per CRTC 2016-496 (i.e. in terms of average or upper bound of latency to minimize complexity and administrative burden). A straightforward standards-based approach to project selection can help reduce the need for the administrator engage in a complex balancing of competing assessment criteria, detailed validation of technical aspects of proposed projects, and be more technologically and competitively neutral. Relative to a complex balancing act of competing assessment criteria, a simplified standard-based approach would also provide more flexibility for local experimentation

and the potential emergence of innovative local and regional models for addressing market failures in the provision of broadband access and transport infrastructure.

59. In this context, we propose that in addition to an open call to finance local and regionally led gaps analysis, engineering assessments of viable solutions, and project design options, for the first few years the Commission should adopt relatively simple and flexible assessment criteria that enable a large number of small projects around the country, rather than locking the administrator and underserved communities into a complex or overly restrictive broadband funding model. After the initial call for project and as they are implemented, we recommend the Commission conducts a detailed evaluation of this experience before a second call, which should be no later than two to three years from the initial call so that necessary adjustments can be make by the administrator and the Commission to improve effectiveness of the funding regime.

Distribution of funding

How should the distribution of funding be designed (i.e. quarterly, annually, or by project progress payments)?

60. This should depend on the type of projects that are being funded, but in general should be designed in an incentive compatible manner to ensure lower levels of government, community organizations, non-profit ISPs, and their private sector partners are making adequate progress relative to prespecified project milestones (on which they should report on to the administrator).

Enforcement of funding agreements

Should the Commission impose a condition under section 24 of the Act on recipients to ensure that they complete their proposed project as set out in their funding agreement with the third-party administrator?

61. Yes, definitely. Such a condition would be critical for utilizing hard performance targets in terms of speeds and minimum service quality standards of basic service the Commission adopted in Telecom Decision 2016-496 with the specific purpose of applying them to improving broadband connectivity in rural Canada via this funding mechanism. However, this will not be sufficient and it will also be necessary to complement such a condition with specific contractual terms and penalties for non-performance relative to the universal service standards that would be relatively easy to enforce through the courts or via independent arbitration clauses, as is standard practice in business contracting among independent parties to efficiently allocate risk.

Should the Commission take any other measures to ensure the accountability of fund recipients?

62. Verifiable and contractually binding minimum performance targets, as well as a robust system for ex post project and network performance monitoring, would be required for enhancing the accountability of fund recipients relative to previous federal programs. Requiring local consultations and empowering local governments and intermediary organizations to hold providers accountable for the quality and affordability of service they deliver will be critical for the success of the funding regime. Stipulating consultations with marginalized communities in project design and developing indigenous engagement plans can further enhance the accountability of recipients and capacity of the funding regimes to address deep inequities in Internet access in within our communities.

Collecting and reporting information from applicants/recipients

How should section 39 of the Act be applied to information filed with the Commission and the third-party administrator(s)?
What information related to the performance of the fund should the administrator(s) be required to report on publicly?
How should project and fund results be shared publicly?
What performance measures should the administrator for the project management function impose on fund recipients for reporting purposes? For example, should recipients be required to participate in a broadband performance monitoring program?
Should any other considerations be taken into account?

63. While standard practices regarding competitively sensitive information regarding project proposals should be maintained not to prejudice procurement processes, some measure of transparency about financial inputs, technologies being deployed, and project outcomes (i.e. number of households impacted, post deployment improvements in measured speeds, quality of service metrics, and affordability) should be collected and made publicly available.

64. While it is critical to monitor the performance of operators, requiring them to participate in a broadband performance monitoring program is not necessary as there are independent network performance testing and monitoring available that allow for this without permission from the operator. Standards-based large scale Internet measurement testing platforms, such as the Network Diagnostic Tool (NDT) deployed by the CIRA Internet Performance Test for example, already enable community-based testing initiatives across the country and can be easily utilized to evaluate rates of network performance growth by operators receiving public subsidies (either directly from the administrator, which we oppose, or as part of a collaborative initiative with lower levels of government and community demand aggregators).

Eligibility criteria

Eligible geographic areas

Should an area with access to broadband Internet service speeds of 50 Mbps download, even if it does not meet all the criteria under the universal service objective, be ineligible for Commission funding? If you support that an area is ineligible for Commission funding if it meets the universal service objective, explain how each of the objective's criteria could be measured and evaluated (e.g. the quality of service metrics in a particular area).

65. Theoretical access to services advertising download speed of 50 Mbps or higher does not mean that they are effectively available to a substantive proportion of people living that particular area. Using such simplistic criteria for defining eligibility can lead to excluding many communities across the country that are truly underserved if the Commission were to look at actual speeds and latency rates operators deliver in a more fine-grade manner. Objective criteria for evaluating the eligibility of a particular areas should be measured speeds and latency from a standard-based approach to measuring them such as the M-Lab/CIRA network measurement platform. "Big data" from such testing platforms may have certain limitations as other sources of Internet measurements, but is standardized and open to both users and lower levels of government for performance validation and broadband mapping.

66. Alternatively, the Commission could require operators to participate in small scale special purpose network testing programs such as the one by SamKnows CRTC uses to evaluate high-level regional and technological differences in connectivity by large operators.[15] This approach is likely to be substantially more expensive to implement compared and reduce compatibility of broadband performance data when considering the fact that many municipal and provincial governments are already using open data from the M-Lab/CIRA testing platform to benchmark and map connectivity in their communities. Quality of Service (QoS) and speeds should be measured from end users to an "off net" test server on the edge of the cloud in the nearest large metropolitan centre for a realistic picture of the quality of connectivity to applications and services on the open Internet (i.e. versus internally cached and potentially prioritized "on net" traffic on well provisioned access links within the networks of large operators).

67. More broadly, for the funding regime to be more effective in translating public subsidies into real network improvements in rural and other underserved communities, all actors need to maintain and build better longer term data management strategies - not just to report on Return on

[15] Please note that in addition to being very small in terms of sample size, raw data from the SamKnows testing initiative at the CRTC has not been made publicly available. It therefore is of little value to lower levels of government trying to benchmark and map the quality of Internet access infrastructure that is available in their communities.

Investment (ROI), but to ensure local needs were met (accountability). The type of "local needs" justification incorporated in the design of the recent CTI program represents a first step in this direction, but is preliminary and it remains to be seen if it will receive sufficient weight in project selection. Given our past experience, we submit the Commission and the independent administrator will have to rely less on what providers claim exists, “best effort” service quality levels they might theoretically be able to deliver, and more on indicators of the end user experience (QoS, etc.). Restrictive eligibility filters based on unreliable data such as maximum advertised rates available in particular communities or hexagons should not be used to reduce the potential for significant oversubscription to the fund from the wide range of under-served communities across Canada.

Should the proximity of an area to the nearest fibre transport infrastructure (e.g. point of presence or point of interconnection) also help determine the area’s eligibility for funding? If so, explain how an area’s proximity to the nearest fibre transport infrastructure should be measured.

68. Access to affordable high-capacity transport services should be a precondition for funding middle mile fibre and access networks. If fibre transport facilities are far away from a particular community, it would be prudent to first focus on extending open access fibre transport facilities to these unserved communities and only subsequently upgrade last mile/access networks. In order to maximize impact of the fund in terms of network improvement to a larger number of Canadians that live and work in rural communities, it might be necessary to prioritize extending fibre transport facilities in the first few years of the fund. Although the recent CTI program was designed primarily to improve access to open access fibre transport facilities in unserved communities, it was significantly oversubscribed and we suspect large gaps in fibre transport access across Canada will remain for the CRTC funding mechanism to help address.

69. In addition to first connecting places where fibre transport infrastructure is not available, it is important to note here that even where there are private fibre transport facilities, they are not necessarily available to rural communities trying to improve connectivity as the CRTC does not mandate third party access to fibre transport facilities. To address this problem we urge the Commission to reconsider its position on mandated third party access to fibre transport facilities, particularly with respect to enhancing incentives of incumbent transport operators to enter into long term dark fibre Indefeasible Rights of Use (IRU) arrangements with rural communities trying to improve quality and affordability of their access to the Internet. Under the current federal regulations, even when there is excess transport capacity available, large incumbent operators lack incentives to enter into IRU transport arrangements with municipalities and rural communities trying to develop scalable next generation access networks.[16]

[16] Or offer wholesale capacity rates that end up exceeding retail rates.

The Commission could use hexagonal units of 25 square kilometres to define geographic areas. What are the benefits and challenges associated with this unit of measurement? If you suggest using other units of measurement to define geographic areas, provide supporting rationale and describe how to implement such units.

70. This unit of measurement is too large to be effective for identifying gaps in small towns and rural communities as there can be significant variation within it. For example, headline speeds that are available at the centre of a small town may exceed the 50 Mbps download standard, but the actual speeds and QoS delivered on long-loop DSL networks that serve surrounding neighbourhoods might be substantially lower than what is "available" in the business core. The M-Lab/CIRA testing platform noted above already allows for much more refined gap analysis and fund targeting (at the postal code, neighbourhood level). Projects should be assessed at multiple levels of analysis in order to ensure they target scarce funds effectively and maximize private investments, while doing so in a cost-effective manner by ensuring that projects are of sufficient scale to be sustainable (i.e. locally and regionally cross-subsidize high cost users with revenues from lower cost ones).

    Should the Commission consider other criteria for identifying eligible/ineligible geographic areas?

71. Provision of equitable access that meets the aspirational speed targets of the Commission in terms of actual speeds and minimum QoS standards the Commission is currently developing should be the primary criteria for being eligible to apply for the fund. All communities that can demonstrate connectivity in them falls below these universal service targets and standards should be eligible to apply on an equitable basis. For those areas where there is no access to open access fibre transport facilities, proposals that help address this either by building new facilities or through a publicly subsidized long term dark fibre IRU should be prioritized to enable scalable and affordable access from those communities to the open Internet. Where fibre transport and middle mile facilities are already deployed and available, their affordability remains a significant concern due to a lack of wholesale access obligations with respect to fibre transport facilities at the federal level. If incumbent operators are not willing to offer IRU's or other scalable wholesale models on transport capacity, some measure of overbuilding incumbent assets may therefore be required for enabling underserved communities to deploy local solutions to concerns about access, speeds, and affordability of broadband in rural Canada.

    If a geographic area does not meet the eligibility criteria established by the Commission, should applicants still have the opportunity to demonstrate that the area should be eligible for funding? If so, what evidence should applicants be required to submit?

72. Yes. As noted, measured speeds and quality of service metrics should be the key determinant for eligibility. Data reflective of the theoretical availability of services with certain "best effort" advertised speeds (i.e. up to xMbps) should not be used in the project eligibility and selection process as it can be highly misleading. Even if there is a significant likelihood of "oversubscription" to the funding regime as was with the CTI fund, any community that fall short of the Commission's aspirational universal service speed and latency targets should be eligible to apply on an equitable basis.

Eligible recipients

Should any criteria regarding eligible recipients in addition to those stated in the Commission's preliminary view be considered?

73. Yes. For reasons detailed in our preliminary comments above, private operators expecting to receive the funds should not be eligible to apply directly to the administrator in a manner that bypasses lower levels of government and underserved communities. This would discourage cooperation and risk sharing between the public and private sector, entrenching old technologies and local monopolies even further in rural communities. Regional non-profit initiatives that aggregate interests of rural communities in order to develop scalable solutions such as SWIFT and EORN should be eligible to apply to the funding mechanism on behalf of their stakeholders.

74. Evidence of constructive engagement with local communities, including various public and private user groups, should be a prerequisite for applying to the fund. Evidence that the community has a good understand of the state of the network and has considered costs and benefits of alternative approaches to improving connectivity would also be critical to include in eligibility criteria in order to ensure projects that are funded meet local needs and conditions. It is for this reason that we have recommended above to segment part of the fund specifically for this purpose in order to enable smaller rural communities to develop scalable and sustainable solutions relative to a top-down formulaic approach of the past.

Eligible costs

Should any eligible costs in addition to those stated in the Commission's preliminary view be considered?
What costs should be identified as ineligible and why?

75. Please see our views noted above with respect to the challenges in balancing different classes of costs as part of this funding regime. Assets with relatively short lifespans should be deprioritized in receiving funds, while highly scalable and shareable ones such as fibre transport facilities and mobile towers should be prioritized. To help address gaps in access to affordable high-capacity

transport facilities, long term (i.e. 20-30 years) Indefeasible Rights of Use (IRUs) are likely to represent the most cost effective way for improving quality and affordability of connectivity in rural Canada.

Funding from a government entity

How should applicants be required to demonstrate that they have secured funding from a government entity (e.g. a promissory note or a signed funding agreement)?
Should any government entities from whom government funding can be secured be added or removed to the following list, which was included in Telecom Regulatory Policy 2016-496: federal, provincial, territorial, regional, and municipal entities; Aboriginal governments; community entities; and non-profit organizations?
Should the Commission define the terms "minimum," "nominal," and "commensurate" for the purpose of implementing the government funding requirement? If so, provide definitions.

76. A promissory note should be sufficient and the list of potential contributors appears adequate as we interpret it to include public non-profit entities such as SWIFT as well as private non-profit organizations such as community cooperatives.

Applicant investment

What evidence should applicants be required to provide that they are able to fund their own investment in the proposed project?
Should the Commission define the terms "minimum," "nominal," and "commensurate" for the purpose of implementing the applicant investment requirement? If so, provide definitions.
What requirements, if any, should be imposed on public sector funding recipients regarding the ownership of Commission-funded assets after the initial capital expenditure (e.g. should there be requirements on when they are able to sell the asset)?

77. What is likely to be appropriate with respect to these questions is likely to depend on how the proposed project is designed to meet local needs and we don't see any reason to adopt an overly restrictive approach with respect to the need to demonstrate own investments or a time-frame for privatizing the publicly subsidized assets. The administrator should follow prudent business practices as necessary to ensure each project is designed to maximize the impact of scarce funds in terms of improved connectivity and remains as open and inclusive as possible to underserved communities with limited internal resources and external borrowing capacity.

Project viability

How should applicants be required to demonstrate that the proposal would not be viable without Commission funding?

78. Viability of projects should be scrutinized using standard methods for modeling market failures in the provision of broadband networks, project risks and financial sensitivity of project with respect to relevant risk factor; in particular the expected take-up rates/revenues from making the investment. The ability of public and private entities to aggregate demand and drive traffic to next generation technologies represents a key consideration in determining their financial viability and sustainability.

Assessment criteria

Project assessment criteria

How much weight should be placed on each project assessment criterion?
Should any of the assessment criteria set out in the Commission's preliminary view in Appendix 1 be modified or removed?
Should any other project assessment criteria be included? If so, provide a description of how they should be assessed and the weight that should be given to them.
Should subscriber uses and network resiliency be included in the list of project assessment criteria? If so, explain any anticipated issues and the weight that should be given to each.
Should any other considerations be taken into account regarding project assessment criteria?

79. Project assessment criteria should not be overly complex and require the administrator to balance multiple competing objectives in a formulaic manner. For example, subscriber uses and network resiliency are important and may be considered as relevant, but trying to incorporate them in assessment criteria in a concrete manner can be challenging. Risks of project failure can be mitigated at the program level by allocating available funds to a relatively larger number of smaller projects, versus a smaller number of large projects. Per CRTC 2016-496, scalability of the technologies should be critical in the assessment process as simply upgrading legacy long-loop DSL and fixed wireless network assets will not be sufficient to have a sustainable impact in terms of closing Canada's extensive rural-urban broadband divide.

Criteria to identify "priority underserved" geographic areas

Should the potential criteria identified in paragraph 46 of the notice be used to identify "priority underserved" geographic areas for funding?
Should any other criteria to identify "priority underserved" geographic areas be considered?

How should each criterion for identifying "priority underserved" geographic areas be measured/defined? How much weight should be given to each one?
What additional considerations should the Commission take into account regarding the criteria for "priority underserved" geographic areas?

80. Priority underserved geographic areas should be identified by ranking broadband speed and QoS measurements (versus advertised up to x Mbps rates that are theoretically available). The 25 square hexagonal system the Commission notes is too large and can generate significant errors in gap identification, as submitted by various rural communities in the CRTC 2015-134 proceeding that led to the development of the funding regime under consideration in this proceeding. Latency and measured downstream/upstream bandwidth should be prioritized over headline (up to xMbps) speeds service providers advertise in identifying priority underserved areas as they represent a more realistic picture of the quality of service end-user experience.

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