10 Strategy Forward

10.1 Introduction

Clearly, the 10 recommendations in Chapter 9 of this Assessment represent a far bigger set if tasks than members of the Northern Communications Infrastructure and Information Systems Working Group can achieve alone.

However, NCIS-WG's role is to provide a forum for discussion and development in the field of communications in the Arctic. the NCIS-WG members can play a key role in assisting many other players within government and the private sector to move the agenda forward, as follows:

- Section 10.2 looks at the role of NCIS-WG members in moving the issues forward, suggesting which recommendations may be influenced or managed directly by members of the NCIS-WG.
- Section 10.3 looks at the need for political and industry support in the development of an Arctic Communications Infrastructure Strategy, and the corresponding recommendations in this report. NCIS-WG members may play a role to move this agenda forward within their own spheres of influence.
- Section 10.4 examines investment issues to be considered by policy makers, investors, regulators, procurement officers and service providers who grapple with the question of the economics of building an Arctic infrastructure that can actually meet the needs of users. Failure in developing an appropriate economic model for the Arctic is at the root of the problems faced by everyone. The related recommendations must be addressed urgently by all those concerned with ensuring a strong communications infrastructure is developed.
- Section 10.5 highlights some examples of future developments in technology, and
- Section 10.6 summarizes some possible next steps for NCIS-WG members as they ultimately work toward developing a better communication infrastructure for the Arctic.

10.2 Role of NCIS-WG Members

The purpose of the NCIS-WG is to develop an understanding of communication capabilities in the North, assets that are available, identification of communications deficiencies and redundancies, and development of a timeline to address concerns/issues.

The NCIS-WG also aims to provide a forum for mutual discussion and

> *"Close collaboration with other government departments will be the key to success in ensuring communications pathways, and shared applications will permit sharing of key information in the interests of pursuing our respective missions and mandates."*
> --- Major Michael O'Donnell, Department of National Defence, Canada Command

development in the field of communications in the Arctic.

The research, meetings, and collaboration required between governments and service providers in order to produce this Assessment has been an important first step in working toward addressing communications infrastructure concerns and issues.

Strategy suggestions

Ideas presented during the visioning sessions for consideration and discussion at future NCIS-WG meetings include:

- Obtain a mandate from the political level to collaborate across governments on solving the communication concerns/issues raised;
- Identify champions within each department to move the issue forward within their own department;
- Continue semi-annual NCIS-WG meetings, casting a wider net to include more departments across the North for collaboration;
- Invite service providers to present technical solutions to the group at formal meetings so members can see what the future may hold.

Some of the recommendations in Chapter 9 could be led by the NCIS-WG as concrete goals to work toward in the coming years. Specific recommendations for consideration by NCIS-WG include recommendations 3, 4, 5 and 9.

10.3 Who Develops an Arctic Communications Infrastructure Strategy?

The decision to solve the communications challenges in the Arctic is a political decision outside of the scope of the NCIS-WG mandate. Sharing the findings of this report may help to move the agenda forward at the political level.

If territorial and federal policy makers decide that modern communications infrastructure is a fundamental requirement for the survival of communities across the Arctic, the next step is determining how to make it happen.

Other countries have taken these steps in the development of their strategies to connect their populations, and the Arctic would benefit in having a well-thought out strategy, distinct from a national strategy. Key steps (as outlined in Chapter 8) include:

Understand the market - Recognize the economic reality of the North as a high-cost, low population region where public funds will be an ongoing requirement for communication networks;

Establish standards - Determine the minimum standards of connectivity for northern communities based on user needs, that enables communities to access services and participate fully in health, education, business, social and safety related activities for the long term survival of communities;

Develop an Arctic Communications Infrastructure Strategy - Develop and articulate a communication infrastructure and broadband strategy that will achieve the minimum standards as defined by policy makers.

This strategy would have to involve policy makers, regulators, and service providers in attempting to map out the rules and regulations for stimulating the development of a service that meets the needs of users at an affordable price, and can evolve over time.

Recommendations 1, 2, and 3 as described in Chapter 9 are issues to be considered by federal and territorial policy makers and service providers in developing a comprehensive Arctic communications infrastructure strategy.

10.4 Investment Plan

It is clear that communications infrastructure in the Arctic will require more public money to support its development and evolution.

An investment plan will need to be developed, making the rules and regulations for public support clear for service providers, public investors and government procurement officers to avoid a haphazard approach to communications development. The CRTC's National Contribution Fund, Infrastructure Canada's National Satellite Initiative, and Industry Canada's BRAND program are all important initiatives, but these types of programs need to work together to ensure public investment results in affordable, reliable infrastructure.

Competition also plays a key role in providing innovative solutions, particularly in the rapidly evolving communications sector, as outlined in Section 8.5. Other countries with comprehensive plans use public funds to help stimulate competition in otherwise uneconomic markets. Investment plans should recognize these issues in determining how investment will be made in Canada's Arctic communications infrastructure.

Canada's public investment in broadband infrastructure pales in comparison to the $33 billion public investment pledge made by the Government of Australia (plus another $10 billion of private investment) to link all of its citizens to adequate communication services. With a geography and population distribution similar to Australia's, it should be of great interest to Arctic stakeholders to watch to how Australia's efforts unfold in delivering affordable access to its remote regions.

It is entirely possible to allocate the necessary public funds to support communications infrastructure development in the Arctic if the political will is in place. The cost of developing a robust communications infrastructure is an inexpensive infrastructure investment in the Arctic, when compared with other infrastructure initiatives like roads and ports. And communications infrastructure investment stands to provide the biggest payback for all citizens in all 75 communities if implemented to a standard that ensures parity.

A sovereign Canadian Arctic requires Canadian citizens to live in it. Resource exploration and extraction is made affordable in part because of the presence of communities with

airstrips, hotels, and local workers. The military relies on a network of Rangers to patrol much of the Arctic. These national efforts require national support.

Arctic residents are key players in the future of Arctic sovereignty and resource wealth generation that will benefit all Canadians. Much of the wealth generated from resource extraction is collected by the federal government. There is a corresponding responsibility to ensure federal support goes back into communications infrastructure that results in opportunities for all people who live in the Arctic.

Relevant recommendations from Chapter 9 for consideration by policy makers, government investors, regulators, procurement officers and service providers include recommendations 6 through 8.

10.5 Backbone Infrastructure Options Evolving Too

Just as recent innovations in consumer products like the iPad or BlackBerry Playbook, or services like Facebook have changed the way consumers connect, recent improvements in backbone infrastructure products also offer new and better ways to connect communities, and people on the land.

As vendors pitch technologies to link a handful of communities, or sell a service to one single government department, government money is sometimes spent to solve a single isolated problem when collaboration may provide better results in the long term.

By developing a strong Arctic communications infrastructure strategy that includes a well-articulated investment plan, it will ensure that public money is not used to purchase services in isolation, that might not meet the needs of the Arctic.

As recommended in this Assessment, it will be important to define the business requirements and outcomes, not the specific technical solution when determining public investment.

Establishing minimum standards, developing a strategy to meet those standards, and developing an investment plan, will set the stage for all vendors to propose innovative solutions for Arctic connectivity that can benefit everyone.

There are many examples of current and potential future initiatives in backbone development of relevance to the Arctic. Some of these are included here for reference. This is not intended to be an exhaustive list - it is only provided to indicate the wide range of possibilities that exist technically.

- NWTel and SSi are both able to upgrade their networks, ground station infrastructure, and terrestrial networks to handle more bandwidth, and are continually evolving their networks as funds permit.
- Telesat plans to launch two new satellites, and still has unused capacity footprinting Arctic communities.

- Arctic Cable Company LLC based in Alaska is planning to install a submarine fiber optic telecommunications system providing a direct low latency route (89 milliseconds) from Tokyo to London, traversing the Canadian Arctic. Their initial estimates to provide fiber links into 15 Arctic communities is $250,000,000.
- Cisco estimates it can effectively link all 75 northern communities with a new 'space-to-ground' IP network that features 'IRIS' (Internet Router in Space) technology that provides high-bandwidth low latency connections via satellite, at a much lower cost/community than fiber solutions.
- The Government of the NWT has commissioned a study to determine the costs and viability of linking communities along the Mackenzie Valley to a fiber connection linking Tuktoyaktuk to Inuvik, and down the Mackenzie Valley to southern NWT. Initial estimates put the price tag at $60,000,000.
- Hughes is launching a new satellite in 2012, with a 100 Gb/s throughput on Ka band.
- TELUS holds a number of federal contracts with responsibility for delivering services to various federal departments in northern communities, and are partnering with local service providers. They too are able to build on their national expertise to access new technologies.
- Communications Research Canada is experimenting with KA-Band dishes for remote connectivity.
- DND is experimenting with a wide range of communication devices in many different Arctic settings, particularly in the field.
- Nunavut Broadband Development Corporation will be investigating the cost of landing fiber into Nunavut communities in an upcoming study this year.

10.6 NCIS-WG Next Steps

The NCIS-WG members may consider these steps:

- review the recommendations in this Assessment;
- determine the NCIS-WG members' tasks in relation to the recommendations and the NCIS-WG mandate;
- discuss strategy suggestions made by NCIS-WG members in the Assessment process;
- determine who should be part of the NCIS-WG going forward;
- determine the group's specific tasks (if any) in relation to the recommendations and strategy suggestions;
- define who will be responsible for carrying out the defined tasks as a result of this Assessment;

Whatever actions the NCIS-WG takes, there is significant momentum built from the production of this Assessment. It is hoped that resolutions to the issue of communications infrastructure can continue to move forward with the vision and efforts of the people involved in the NCIS-WG, and the many stakeholders who want to be part of the solution.

This Arctic Communications infrastructure Assessment report is published online at www.aciareport.ca in an effort to make the data and findings widely available to all Arctic stakeholders.