



Connecting Citizens Grant Program Grant Recipient Final Report

Signing Authority:	Mr. Bernard Ziegler
Contact:	Mr. Harvey Janszen
Project:	Saturna Net Co-operative Network Expansion Project - P015-2010
Project Number:	P015-2010
Grant Number:	TEL-279
Grant Amount:	\$50,000
Prepared:	07.03.2012

Technical Solution

Project Description

From your grant application

Saturna Net Co-operative (SNC), a non-profit cooperative registered in the province of British Columbia, is seeking grant funding to assist in the expansion of a new High Speed Internet service. The expansion plan is to pass the current service from the main population to the Northeast side of the island via a radio relay station to be constructed on Samuel Island. This will expand potential service to approximately 50 properties, which face the Strait of Georgia and are separated from the rest of the island by densely forested mountains. Without this expansion, the properties on the Northeast side of Saturna Island will not have access to very high quality and very high speed Internet access.

Community Connected

List communities connected with this grant funding

Saturna Island in British Columbia' Georgia Strait is home to 335 full time residents and several hundred additional seasonal residents. The island has approximately 425 dwellings, which are in three concentrated groups spread out along the shoreline and within 100-150 metres the ocean. The island is a mountainous environment and is home to several tourism businesses, construction businesses and business owners with operations off the island. Providing a reliable and efficient high speed Internet service will help to improve the quality of life and economy by improving communications of residents and businesses to mainland and global resources.

Saturna Net Co-operative successfully connected the south and west side of Saturna Island as a result of the second round of the Connecting Citizens Grant Program. This included coverage of an area with approximately 225 homes (many of which are seasonal vacation homes). The current phase completed connection to the Northeast shore of the island serving an area with an additional 140 residential properties. The access points and connections were complete by the end of December 2011.

Technology Deployed

Last mile distribution technology used.

At the core of SNC's network are three servers, which act as a control and monitoring solution created by Alekan Integrated Solutions of Kamloops, BC. The network core includes a gateway, Authentication, Authorization and Accounting server, Network Access Server and a network monitoring application (which is hosted on a server capable of providing emergency spare parts for the other two servers).

From the core, services are delivered by fixed wireless radios manufactured by Ubiquiti Networks. The M5 series chosen for Saturna Island and has proven to be a very reliable, affordable, and effective medium for distribution. These radios operate in the 5GHz unlicensed spectrum and, due to Saturna's rural location, do not have interference issues. Radio throughput can be up to 300Mbps with an average of 120Mbps.

The Ubiquiti radios use a proprietary TDMA protocol branded as AirMax. Management is through Ubiquiti's AirControl software using web interfaces. All radios are configured as bridges and communicate on a subnet that is isolated from the internet.

Each member of the co-operative is required to have a router, which connects to the fixed radio. The co-operative chose to provide and maintain

the routers to minimize technical confusion by its members. The routers are mostly the same brand and model, use WPA2 security and are configured on a uniform template.

Network ISP

Internet service provider that set up and administers the network

Saturna Net Co-operative is a non-mobile, non-satellite broadband service provider for Saturna Island. It services and administers the network mostly on its own using one full time on-call technician. For long term maintenance support, engineering, and organizational planning, SNC has contracted the services of Alekan Integrated Solutions Inc. Alekan was on site for the construction and installation of the first phase of the new network and contributed to the planning and deployment of the second phase. Alekan is available to occasionally perform proactive and reactive maintenance remotely.

Changes To The Network

Was this the same technology, network architecture and ISP proposed in your application? If not, please explain.

The overall technology, architecture and ISP were unchanged from the first phase and the outline in the application for third round funding. Several of the secondary access points were relocated to improve service. In addition the planned solar power source for the Samuel Island access point was revised to include a Methanol Fuel Cell to insure service through the winter. The solar/ethanol fuel cell power source was acquired from Ensol Systems of Surrey, BC.

Internet Gateway Provider

State the internet service provider supplying the gateway and the bandwidth provided for your network

Navigata Communications 2009, Inc. provides SNC with a wireless feed from Bruce Peak, Salt Spring Island. The service provided by Navigata is a dedicated 10 Mbps symmetrical service, which is open up to 15Mbps. The service contract is negotiated at a flat rate and has proven to be a very reliable service.

Financial Reporting

Project Grant: \$50,000 **Actual total project spent:** \$57,069

Variance: \$7,069

Description of Variance

How did you address the variance in your actual total project spent?

The total expenditure of the project was originally forecast at \$58,000, within \$931 of the actual project cost. Given this, the SNC board of directors had credit and cash available for the total cost of the project.

All contractors have also been paid for their effort and time in prearranged agreements. Other than Alekan and Ensol Systems, contractors were hired locally and were members of the cooperative.

Currently the cooperative has balanced books and a business plan anticipating equipment replacement on a 3 to 5 year cycle.

Other Funding

Did you use the CCGP grant to leverage funding from other sources? If yes, please explain

No other grant funding was leveraged as a result of the CCGP grant. Regular monthly subscription fees collected from cooperative members paid for expenditures beyond the \$50,000 grant.

Budget:

Attached in *Appendix A* is a final budget that reports on sources of revenue and project expenditures.

Project Accomplishments

Projected Number of New Subscribers

21 subscribers were connected and 6 new connections within the expansion area are scheduled.

Actual Coverage Area

If project area has changed, the indicate the number of potential new subscribers

A total of 115 subscribers use the update SNC network on the South side and Northeast side of Saturna Island. Many of the non-connected homes are seasonal vacation homes. With the exception of the South side of East Point and some sparsely settled interior areas of the island all major population centres are now served.

Anchor Tenants

Indicate if you have one or more committed customers (anchor tenants) on your network (i.e. business or government

Saturna Net Co-operative has several anchor tenants (members) including: Parks Canada, Saturna General Store, Lighthouse Store and Pub, Saturna Emergency Services, Saturna Library, Saturna Island Family Estate Winery, Vancouver Island Health Authority (local clinic), Saturna Island Recreation and Cultural Centre and Saturna Island Local Trust Representatives.

Marketing/Promotion

Attach any advertising, news articles or publicity for your network

Since SNC is a non-profit organization, no active marketing or promotional programmes are implemented by the cooperative; however, the local newspaper, The Saturna Sunset Scribbler, has provided SNC organization updates for residents and businesses. Also, the Saturna Island Property Owners Association has provided written support and updates regarding the cooperative and its broadband access activities. Subscription and operational information is available on the Co-operatives website <http://www.saturnanet.net>

Testimonials & Success Stories

Attach any customer testimonials or positive feedback you have received for your network.

We have a small transportation-consulting firm with clients throughout Western Canada and the US. We had been trying for years to conduct more of our day-to-day business from Saturna Island to allow us the freedom to spend more time on-island. One of the biggest barriers was the lack of a reliable high-speed internet service. We tried to operate with the Roger's wireless network, but it simply didn't have a reliable enough signal for conducting business. So we signed up for the Saturna Net Co-op service. It was a bit more expensive than the high-speed service we had in Vancouver (Telus), but we figured that was the small price to pay for the freedom of living and working on our island.

So here is what we found. The Saturna Net Co-op service is far more reliable than the internet service provided by Telus in Vancouver - even after considering windstorms and BC Hydro power outages on Saturna. And it is consistently three to four times faster. In fact, Saturna Net Co-op service is faster than the considerably more expensive "premium" service offered by Telus. Saturna Net Co-op service has been instrumental in allowing us to conduct more of our business from Saturna, reduce our travel (and our carbon footprint) and improve our lifestyle. How could we not be delighted with this kind of service and outcome?

Paul Brent and Eva Hage
116 Winter Cove Road
Saturna Island

I write in follow-up to our November 21, 2009 letter which stated SIFPS' strong support of the Saturna Island Internet Co-op's application for a "Connecting Citizens Grant" - that grant was approved and has been put to good work in the delivery of reliable broadband internet access service to a large part of Saturna island.

The Saturna island Internet Co-op has delivered on its commitments to date, in line with its planned approach based on the consultant led study initiated by them in 2009. We need to be able to rely on timely and effective access to the internet, especially during times of unplanned emergencies - less than this will drastically increase the community's safety risks.

John W. Savage
President
Saturna Island Fire Protection Society

Our members - local accommodation and food providers, tour operators, artists and service business - rely on the Saturna Net Co-op internet service both under the collective SITA umbrella website and individual web page. We do much of our marketing, communications, bookings, supply ordering and even banking online. Simply put, SITA members need a strong, reliable internet provider to compete for our share of tourism business, both today and into the future.

We appreciate the current service and feel lucky to have the Saturna Net Co-op working hard to create a stable online platform, especially as we have no access to service from phone and cable companies. Many of us have benefited from the enhanced connectivity resulting from the upgrades you have completed.

Joe Harris
President
Saturna Island Tourism Association (SITA)

I want to thank you for all of your hard work and continuing efforts with SaturnaNet to supply an excellent internet service provider here on Saturna Island. The service has been excellent and we have been very happy with it. We could not easily continue to work (and live) in this beautiful place without the services that you provide. Thank you for keeping us connected!!!

Sincerely, Priscilla Zimmerman MAIBC AIA
Zimmerman Architecture
105 Church Bay Road
Saturna Island, B.C. V0N 2Y0

As a Realtor on Saturna Island the service you have been providing is paramount to the success of my business. I use my computer for creating web forms, listings on the MLS, website updating and client communication which tallies up to approximately 90% internet time. I am grateful that saturnanet provides local, affordable and fast internet service for me to do my job so efficiently.

Susanne Middleditch
Gulfport Realty Saturna Island

I am writing in my capacity as the president of the Saturna Island Property Owners' Association (SIPOA). We understand that The Saturna Net Co-op has recently received a \$50,000 grant from Network BC's Connecting Citizens Program, which was intended to expand high-speed internet to the East Point area of Saturna Island. Saturna Net Co-op has been enormously successful in achieving this objective and, as a consequence, it has been able both to improve service to existing customers there (providing them with state of the art radio and transmission equipment), as well as to sign up a dozen or so new customers on that end of the island.

SIPOA represents approximately 50% of the property owners on Saturna Island and therefore we have a direct experience with the remarkable success of the Saturna Net Co-op. Writing on behalf of our membership who have all been directly touched by the success of this initiative, we wish to express our sincere gratitude to Network BC for funding such an important and successful initiative. We recall writing a similar letter to you in connection with the first grant in 2010 which provided vital funding used to provide service to the for the west end of the island. Thanks to the current grant, Saturna Net Co-Op has effectively been able to complete its mission.

On behalf of the Saturna Island Property Owners' Association, I want to express our deep gratitude to you for your generous assistance.

Murray Rankin
President Saturna Island Property Owners Association

Additional Comments

The Saturna Net Co-operative has very successfully established itself as a reliable Internet service provider for Saturna Island. SNC has carried the success of the southern network to North and Northeast Saturna Island in the spring of 2011 so that homes in this area may experience the benefits of good quality high speed Internet access.

The fixed radio network deployed by the cooperative delivers users an average symmetric data rate of 6.5Mbps with some users geographically near the core accessing 15Mbps symmetrically and the farthest users from the core (in geographically difficult locations) accessing 3.5Mbps symmetrically. Speeds throughout the network have been increased this year by careful re-aligning of the backbone radio antennas and an improvement in Ubiquity's firmware

Because SNC is a cooperative and a non-profit organization, users of the service have no access caps and there is a flat billing rate. Delivery is best effort with a minimum access delivery rate of 1.5Mbps down and 0.5Mbps up. (This level of service is only to a few members in very difficult locations)

The greatest challenge experienced by the cooperative was delivering service over the complex topography of the island. Many relay stations were required to "pass" the service from one location to the next. The co-operative membership model facilitated placement of access points. The new network, however, significantly reduced the number of relay stations required compared to the previous system.

These grants have allowed the Saturna Net Co-operative to significantly improve the bankrupt system we took over. The quality of installations was significantly improved, setting a new standard for the cooperative. Previous cable installations were found to be inadequate (wrong cable types), dangerous (fire hazards), and incorrect (bad termination and wiring blocks). The poor quality of the previous network's cable and installations resulted in a significant labour cost overrun on the round two grant due to the time required to fix them.

Off setting the labour overrun was a decrease in equipment costs including the core network servers and radios. Also, the co-operative did not choose to proceed with switching gateway service providers to TELUS, as projected in the round two application, saving several thousand dollars from a required TELUS construction charge.

The new network has been very well received by the residents and businesses of Saturna Island who now have access to a very reliable high speed Internet service. The new network has significantly reduced installation and maintenance costs.

Many thanks to Network BC for its support in helping Saturna Island achieve access to broadband Internet, a truly essential service.

Appendix A:

Project Expenditures

Expense	Cost
Electrical & Cable	\$317.00
Tree Climbing	\$2,648.00
Misc. Materials & Supplies	\$649.00
Solar/Fuel Cell Power Source	\$15,469.00
Radios, Antennas and Infrastructure Equipment	\$17,146.00
Alekan Supplies and Materials	\$835.00
Alekan Labour and Travel	\$8,155.00
Labour	\$11,850.00
Total	\$57,069.00

Current Operating Budget

Saturna Net Co-operative has a fairly static, predictable revenues and expenditures due to its membership and non-profit model.

Item	Cost
Subscription Income	\$5,450.00
Gateway ISP Fees	-\$2,560.00
Technical Maintenance	-\$2190.00
Pro-rated Equipment Replacement	-\$490.00
Misc. Expenses	-\$260.00
Total	\$0.00

SNC expects the current operating budget to continue along this path with a projected reduction in the Technical Maintenance cost now that the system is complete and in steady state operation. We show a zero net income considering revenue generated above fixed costs will be banked for long-term replacement and maintenance plans as shown in the Pro-rated Equipment Replacement item above. Equipment will be cycled every three to five years depending on need.