



NOTICE

MEETING: St Mary's Municipal Council
Committee of the Whole

DATE: Wednesday, February 7th, 2024

TIME: 4:00 pm

PLACE: St. Mary's Municipality
Council Chambers, Sherbrooke, NS

Please advise if unable to attend



Municipality of the District of St. Mary's

Committee of the Whole Meeting Agenda
Wednesday, February 7th, 2024 at 4:00pm

We acknowledge that we are gathering in Mi'kmaqi the traditional unceded territory of the Mi'kmaq people.

1. Call to Order
2. Roll Call
3. Additions to the Agenda
4. Approval of the Agenda
5. Approval of Minutes: COTW held January 17th, 2024.
6. Business Arising from Minutes
7. Correspondence
 - a. Provincial Response to municipal request for assistance to broaden cellular phone service.
 - b. Provincial Response for assistance with Construction and Demolition waste disposal.
8. Presentation: Rural Communities Foundations of Nova Scotia – Hugh MacKay
9. Other Matters of Business
 - a. Canoe Procurement Services
 - b. Connect 2 Grant Options for Active Transportation verbal update
 - c. CMHC Housing Accelerator Fund: Next Steps
 - d. 2024 Cost of Living Review: Budget Planning
 - e. Rink Fund: Options for 2024 RecPlex Work
 - f. Fibromyalgia Awareness Day

10. In Camera: Legal

Adjournment



Municipality of the District of St. Mary's

Committee of The Whole (COTW) Meeting

Wednesday, January 17th, 2024

We acknowledge that we are gathering in Mi'kma'ki the traditional unceded territory of the Mi'kmaq people.

1. Meeting, Date & Time:

Warden Wier called the COTW Meeting of the St. Mary's Municipal Council to order on Wednesday, January 17th, 2024, at 4:00 p.m. in the Council Chambers, Sherbrooke, N.S.

2. Attending:

Warden Greg Wier

Deputy Warden James Fuller

Councillor Everett Baker

Councillor Courtney Mailman

Councillor Beulah Malloy

Councillor Charlene Zinck

Absent with Regrets:

Councillor James Harpell

Also Attending:

Doug Patterson, Chief Administrative Officer (CAO)

Marian Fraser, Director of Finance (DOF)

Jadzia Graham, Interim Municipal Clerk

Denise Dunn, Economic Development Officer (EDO)

Teddy Stevens, Director of Public Works

3. Additions to the Agenda:

- Addition to 9.a. Sewer System Repairs
- Addition to Correspondence – Letter from Honourable Sean Fraser

4. Approval of the Agenda:

On the motion of Deputy Warden Fuller, and seconded by Councillor Zinck, Council approved the agenda as presented.

Motion approved.

5. Approval of Minutes:

On the motion of Councillor Baker, and seconded by Councillor Mailman, Council approved the minutes of the COTW Meeting held January 3rd, 2024.

Motion approved.

6. Business Arising from the Minutes:

- Council asked about the Canada Summer Jobs Grant, and staff informed it has been completed.

7. Correspondence:

- Letter from the Municipality of Guysborough, inviting the municipality to have a joint Council meeting with the Municipality of Guysborough.
- Letter from the Honourable Sean Fraser, received the Housing Accelerator Fund (HAF).

8. Presentation: Coastal Nova Scotia:

- See the attached presentation.

On recommendation of Councillor Malloy, and seconded by Councillor Baker, Council agree to give Deans-Coastal Nova Scotia their annual \$4016.35 contribution.

Recommendation adopted.

9. Other Matters of Business:

a. Public Works Water Plant Repairs

- See the attached staff report.
- 3 out of the 6 cushion tanks need to be replaced at the Water Treatment Facility.
- During recent inspections by Public Works staff discovered that 3 out of the 6 cushion tanks have ruptured bladders within them.
- Public Works staff have received pricing on replacement cushion tanks for the Water Treatment Facility. The cost of new cushion tanks is \$2,505.72 each for a total of \$7517.16 plus tax. These funds will come out of the Capital Reserve Budget.

On recommendation of Councillor Baker, and seconded by Councillor Zinck, Council agree to approve the necessary costs, to replace the three cushion tanks in order to protect the distribution system from breakage and leaks to a maximum cost limit of \$8500. Plus, tax.

Recommendation adopted.

Village Lift Station

- It was identified by Public Works staff that the piping components of the Village Lift Station has begun to fail.
- Public Works staff has reached out to numerous companies to get pricing for the work, Partner Construction which operates out of New Glasgow, Nova Scotia has been the only company willing to complete the work.
- The cost of repairs in the lift station is estimated to be no more than \$7500, plus HST.

On recommendation of Deputy Warden Fuller, and seconded by Councillor Mailman, Council approves the repairs to the Municipal lift station as soon as possible to ensure the operation of the wastewater treatment collection system. This approval is to a maximum cost of \$7500, plus HST.

Teddy Stevens, Director of Public Works left the meeting at 4:36 p.m.

b. Operating and Capital Budget Deliberations Timeline

- See the attached report.

On recommendation of Councillor Malloy, and seconded by Councillor Baker, Council recommends setting the 2024 2025 Annual General Meeting date as Monday, April 8th, 2024 at 5:00pm.

Recommendation adopted.

c. 2024 2025 Application for Residential Low-Income Property Tax Exemption

- See the attached staff report.
- Marian Fraser, Director of Finance informed Council of the total income threshold, in 2023 the threshold was set at \$24,00.00 increased from the 2022 application of \$22,600.00.
- Marian Fraser, Director of Finance informed Council of the CPI data for November to November was set at 2.5% and October to October was set at 3.2%. (which is also the PVSC CAP rate.)

On recommendation of Councillor Zinck, and seconded by Councillor Malloy, Council approve the 2024/2025 Application for Residential Low Income Property Tax Exemption with the total annual household income threshold set at less or equal to \$25,280.00 and the tax exemption credit amount set at \$180.00 per application, all other eligibility requirements to remain the same as outlined in the application.

Recommendation adopted.

d. 2024 Property Tax Assessment Roll Summary

- See the attached staff report.
- Marian Fraser, Director of Finance informed Council of the property assessment notices being sent out to residents from PVSC.
- Total potential revenue increase if the tax rates remain the same as 2023/24 is \$209,488.00.

e. 2024 2025 Uniform Assessment Roll Summary

- See the attached staff report.
- Marian Fraser, Director of Finance informed Council of the Uniform Assessment the education expense for the Municipality for the fiscal year 2024-2025 will increase by \$65,013.00, a 10.19% increase from 2023-2024.

Denise Dunn, Economic Development Officer (EDO) left the meeting at 4:52 p.m.

Denise Dunn, Economic Development Officer (EDO) returned to the meeting at 4:55 p.m.

f. Recreation Services for Seniors

- See the attached staff report.
- Staff would like to collect ideas from councillors for how to utilize the remaining seniors funding by the end of the fiscal. If any councillors have any specific ideas or requests from constituents or organizations, please send them along to Community Development and Recreation staff for consideration.
- Some considerations made by the Council were; healthy food cooking classes, a dietician to teach about nutrition, painting classes, a webinar or session to learn from a lawyer about wills, and a foot clinic.

g. Sunflower Accessibility Planning

- See the attached staff report.
- Staff proposed that the Municipality Advertise and buy the Hidden Disabilities Sunflower products

On recommendation of Councillor Mailman, and seconded by Councillor Zinck, Council approves that the Municipality of the District of St. Mary's become a member of the Hidden Disabilities Sunflower Program under the Standard Membership Plan and decide on 1-2 wearable products to purchase for members of the public and staff (in support).

Recommendation adopted.

h. Kairos Blanket Exercise

- See the attached staff report.

- Staff are looking for dates and times that council is available to participate in a Kairos Blanket Exercise in January. At least two dates should be confirmed, in case one is unavailable. The number of participants that are needed to offer this workshop is 15, additional participants will have to be identified in order to host the training.
 - Once participants and a date have been determined, staff can book the session, confirm participants and make preparations to host an elder.
- i. 211 local landmarks
- See the attached staff report.
 - 2-1-1 Nova Scotia is a service funded by the Government of Nova Scotia and United Way that offers a free and confidential service that connects people in Nova Scotia to the community, programs, and resources they may need. 2-1-1 is a 24-hour, 7 days a week, and is in over 240 languages and available through email, text, web-based chat, and a virtual relay service for people who are deaf or hard of hearing.
 - Staff informed Council that February 11th, 2024 will be 2-1-1 day and that the Municipality should advertise and promote the 2-1-1 program.
 - Staff recommend that the municipality illuminate some significant landmarks and buildings in red, in support of 2-1-1 Day.

On recommendation of Councillor Mailman, and seconded by Councillor Baker, Council supports illuminating significant buildings and landmarks red on and/or leading up to February 11th, 2024, and incorporating some 211 Day posts into your social media accounts and district messaging.

Recommendation adopted.

j. Land Survey

- See the attached staff report.
- Staff gave Council an update on the municipal land PID: # 37501095 Sherbrooke to be reserved to be potential housing project space.
- Considering that multiple parties will be reviewing the potential of PID # 37501095 from Housing and Healthcare perspectives and to protect the existing Stonewall Park trail system, a survey of the parcel of land along with delineation of Stonewall Park would be prudent.

On recommendation of Deputy Warden Fuller, and seconded by Councillor Baker, Council recommend Staff create a Request For Proposal for Land Survey and park delineation services.

Recommendation adopted.

Denise Dunn, Economic Development Officer (EDO) left the meeting at 5:30 p.m.

10. In-Camera: Per MGA Section 22 – Personnel

On motion of Councillor Malloy, and seconded by Councillor Zinck, Council agree to move In-Camera for Personnel at 5:32 p.m.

Motion approved.

On motion of Councillor Malloy, and seconded by Deputy Warden Fuller, Council agree to reconvene to regular session at 6:18 p.m.

Motion approved.

Adjournment

On motion of Councillor Mailman, and seconded by Councillor Baker, there being no further matters of business, Council adjourned at 6:19 p.m.

Motion approved.

Recorded By
Jadzia Graham, Interim Municipal Clerk

Approved By
Warden Wier



**Public Works
Office of the Minister**

PO Box 186, Halifax, Nova Scotia, Canada B3J 2N2

JAN 25 2024

The Municipality of the District of St. Mary's Council
Box 296, 8296 Highway #7
Sherbrooke, NS B0J
doug.patterson@saint-marys.ca

Dear Warden Wier and members of Council:

Thank you for your letter dated January 9, 2024, to Premier Houston regarding reliable cell coverage. As the Minister responsible for the Department of Public Works, I have been asked to respond on the Premier's behalf.

Our government understands the importance of reliable cell coverage for Nova Scotians, which includes emergency situations. The provincial investment of \$47.3 million to start the new Cellular for Nova Scotia Program will expand telecommunications infrastructure and communications networks throughout the province.

The initial cell gap study, which you have referenced, and additional analysis, provides an understanding of the scope of the problem. Areas throughout the Municipality of the District of St. Mary's – which includes approximately 75 kilometres of primary roads and 940 civic addresses – show as having no and/or poor cell coverage based on this analysis.

As requested, attached is a copy of the cell gap analysis report.

The goal of this project, which is being led by Build Nova Scotia, is to develop, as quickly, efficiently, and effectively as possible, a plan that covers as much of the province as soon as practicable.

The project will involve a two-phased approach:

The first phase included a Request for Proposals (RFP), which is now closed, and submissions are under review. As part of this request, service providers were asked to consider submitting proposals that used any existing infrastructure that would help close gaps and improve service in underserved areas. The focus of this round is two-fold: more immediate innovative solutions and speed of delivery.

The second phase will include an additional RFP to seek solutions to address remaining gap areas, including creating infrastructure.

This approach also ensures that the solutions identified are sustainable and are being coordinated with any federal and provincial initiatives planned or underway, while ensuring maximum coverage as early as possible. Build Nova Scotia will look to maximize investments from and leverage key partnerships with the Federal Government, municipalities, and the private sector.

Overall, the goal is to reach the following coverage targets throughout the populated areas of the province:

- 99% coverage for Basic Voice Call service
- 95% coverage for Standard-Definition service (e.g. emails, web browsing, and social media)
- 85% coverage for High-Definition service (e.g. video conferencing, movie streaming, and other data intensive applications)

For reference, updates to the project page at <https://internet.buildns.ca/cell/> will continue as the program progresses.

Thank you for the offer to have a conversation with the Municipality of the District of St. Mary's about the cell program and the observations that you have provided in your correspondence. I have asked David Benoit, President and CEO of Build Nova Scotia to reach out to you to find an opportunity to discuss this issue at a mutually convenient time.

We are working closely with service providers and government partners to help ensure reliable cell coverage for all Nova Scotians as quickly as possible. We look forward to our upcoming conversation.

Yours sincerely,



Kim D. Masland
Minister of Public Works

c: Greg Morrow, MLA Guysborough-Tracadie
Sean Fraser, MP Central Nova

Attachment (1)



DEVELOP NOVA SCOTIA

Cell Gap Analysis

Final Report



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1. Introduction

This report presents the results of the Cell Gap Analysis study completed by FarrPoint for Develop Nova Scotia (DNS).

1.1. Background

The importance of excellent cell coverage is well understood across the marketplace as being a key enabler for business and social activities, whether that be on the move, at home or in the workplace. There is a global move towards increased digitalisation and a continuing need to develop and invest in the underlying infrastructure, while in parallel helping to develop digital skills in the labour force. This need has been further highlighted through the COVID pandemic as the workforce is dispersed from traditional urban settings and the issues of urban/rural divide are evident. Cellular usage is predominantly based on LTE (4G) technology as the current widely available standard. This provides good, responsive speeds which are adequate for the vast majority of use cases and with multiple handsets and packages available to allow widespread adoption.

Coverage is provided across Nova Scotia by the commercial cellular operators Bell, Rogers, Telus and Eastlink through a network of cell towers and roaming agreements. The coverage from these towers depends on technical parameters including frequency, antenna height and power which can vary by tower location and operator. The performance to the end user is also reliant on the data throughput from these towers and that again depends on the technical parameters of frequency channel and onward connectivity from the towers into the operators' networks.

Tower locations are designed on a cost/benefit basis to provide the maximum return for the operators in terms of subscriber take-up and retention. The effect of this is that in rural areas where subscriber numbers are low, or in hard to serve areas where the cost to provide is high, coverage will be less.

Good cellular provision is complementary to good, fixed broadband connectivity and is an essential part of the mix in delivering a well-connected province. DNS appointed FarrPoint to undertake a study to map out and measure the cellular connectivity capabilities across Nova Scotia.

1.2. Project Approach

The study is based on a combination of desktop analysis, complemented by on the ground measurements and analysis. This is shown in Figure 1.



Figure 1: Project Approach

1.3. Report Structure

Following this introductory section, the remainder of the report is set out as follows:

- Section 2 presents the initial desktop results of coverage;
- Section 3 describes the drive surveys undertaken and their input to the analysis;
- Section 4 presents details of the coverage infill solutions and costs;
- Section 5 provides conclusions.

2. Initial Results & Analysis

2.1. Approach

Desktop analysis was conducted of coverage using available data on tower locations, heights, frequency, channel bandwidth, and power. This detail was sourced from the Government of Canada Spectrum Management System Data and input into FarrPoint's ATDI HTZ Communications radio planning software to assess potential coverage from each tower.

The results were then input to FarrPoint's online GIS (Geographic Information System) and online mapping portal, together with an overlay of the following data sets: Civic Address points (Feb 2022), NBD Pseudo-household points (Feb 2022) and Roads (Feb 2022).

This allowed for the calculation of the number of locations without coverage, the % geographic coverage and % road coverage, across the province.

2.2. Signal Thresholds

Indoor and outdoor thresholds were used for RSRP (Reference Signal Received Power) which is a commonly used metric for measuring LTE signal strength. The thresholds are commonly used by cell operators as a basis for measurement and by a number of industry sources¹. The comments provided in Figure 2 are an indication of the type of service that users may experience from these different signal levels. However, numerous factors are at play that will influence this experience including the channel bandwidth implemented by the cell operator and the number of simultaneous users on the site.

Measure	Threshold	User Experience Comments
Outdoor	-114dBm	Voice and Basic Data outdoors
In Car / Rural	-110dBm	Voice and Basic Data in vehicle and rural indoor
Indoor Suburban	-102dBm	Improved in vehicle and indoor rural data. Basic indoor suburban service
Indoor Urban	-95dBm	Enhanced indoor data experience
Indoor Dense Urban	-91dBm	Good service level in most environments

Figure 2: Signal Strength Thresholds

¹ Eg https://www.ofcom.org.uk/__data/assets/pdf_file/0012/122250/about-mobile-luaa-data.pdf

This means that any signal less than -114dBm is treated as no coverage. The maps shown in this report use these thresholds as indicated in the accompanying legends. The thresholds shown above these levels will be unlikely to provide significantly better throughput, but these stronger signal levels will improve the stability and quality of the connection.

2.3. Initial Results

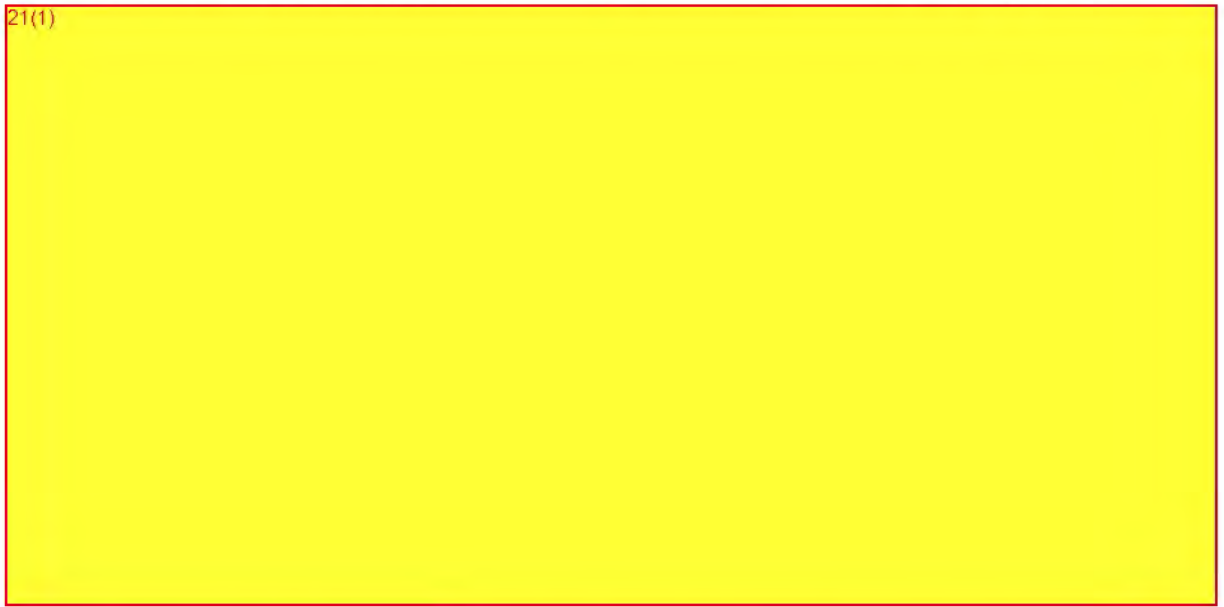
The results are broken down into:

- overall geographic coverage;
- address coverage;
- primary road coverage.

2.3.1. Geographic Coverage

Figure 3 presents the indoor and outdoor area coverage of the whole province for each operator.

21(1)



Geographic coverage will of course include areas with no population and with no road network and so areas of no coverage would be expected. The metrics of address coverage and road coverage are of more interest to support economic and social activity.

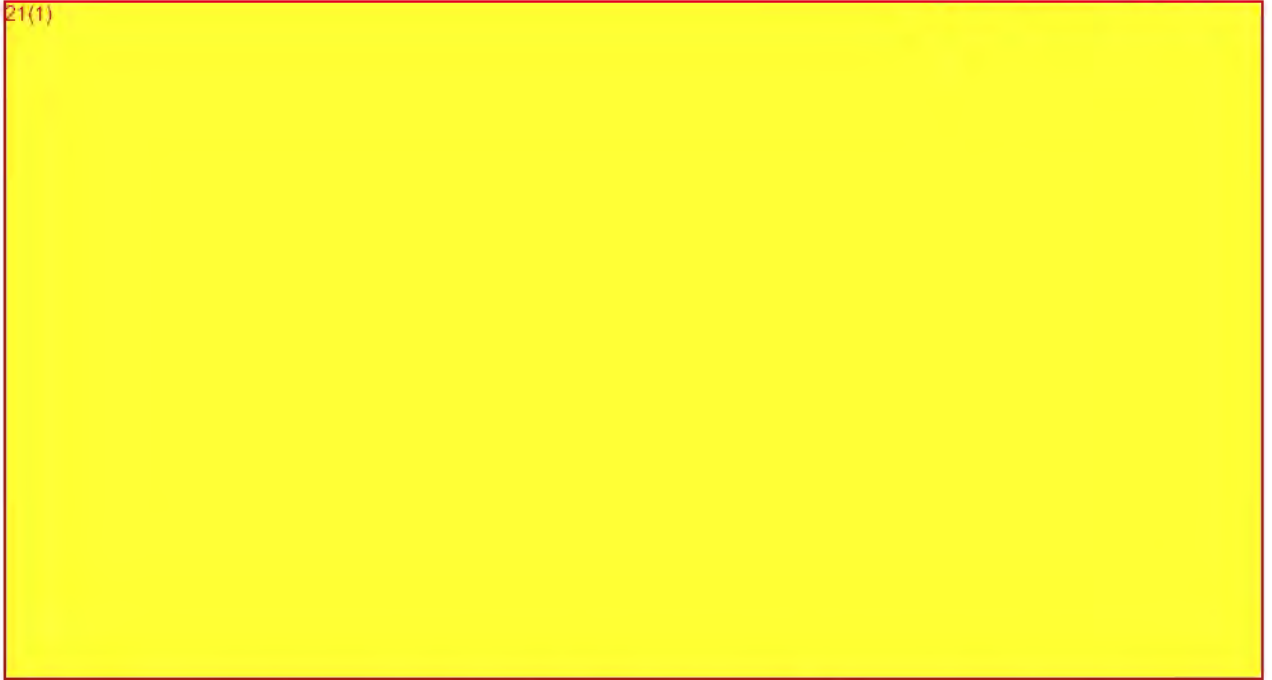
2.3.2. Address Coverage

Figure 4 presents the indoor and outdoor coverage of the total number of civic addresses in the province for each operator. This shows, for example,

21(1)




21(1)



This is also represented in the mapping portal by the number of civic addresses that can receive service from at least one operator as shown in Figure 5.

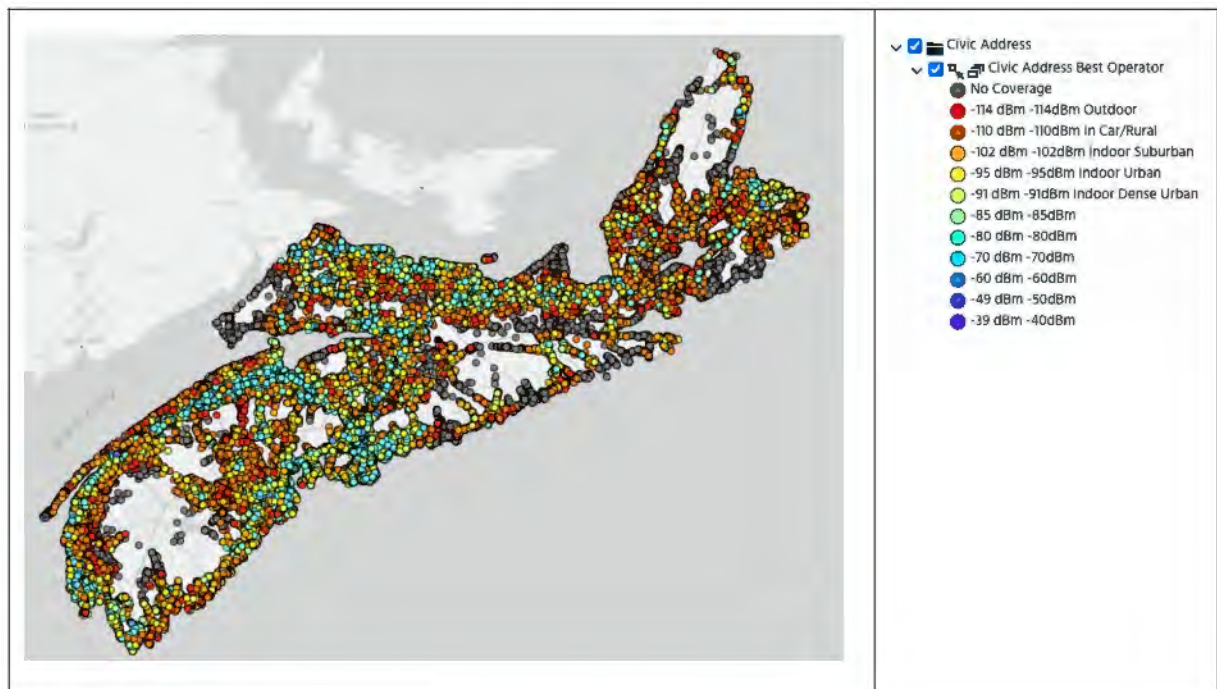


Figure 5: Address Coverage

Figure 5 shows significant areas with no coverage as shown in grey, particularly in the west of Cumberland County, across Guysborough County, Antigonish, Richmond and through Inverness County. The signal level thresholds shown in the legend range from basic (voice and low level data access) outdoors shown in red, through orange (the same service level inside a vehicle) and three further thresholds for indoor coverage in various urban densities.

Figure 6 presents the % indoor and outdoor coverage from any operator of the total number of civic addresses, broken down by county.

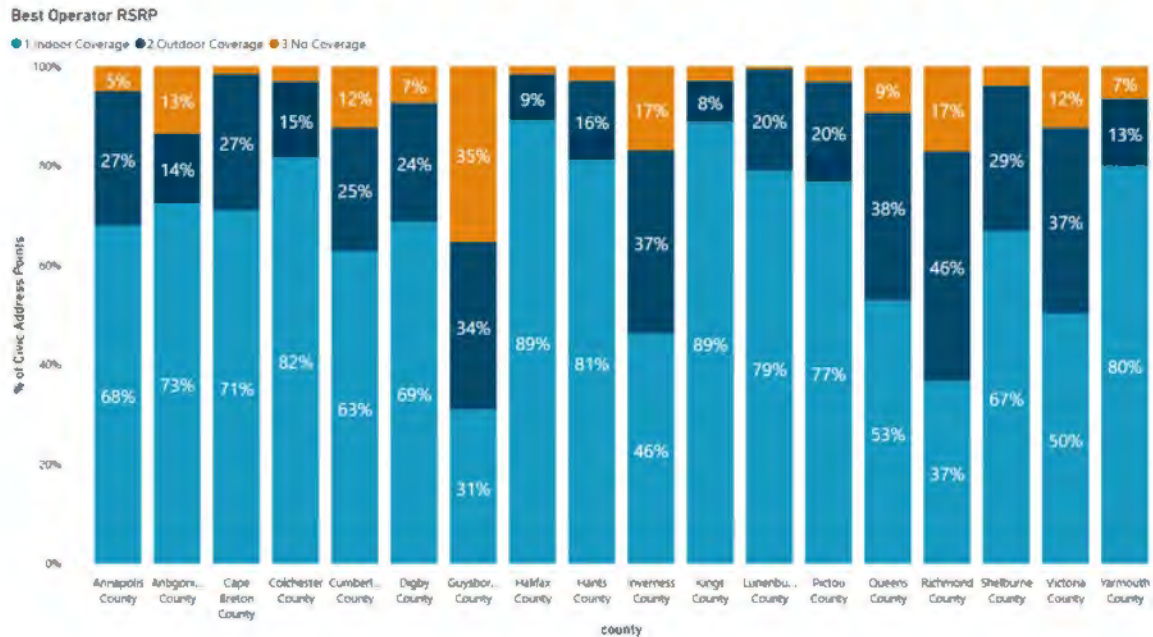


Figure 6: Civic address % coverage by any operator

For example, this shows that Guysborough County has 35% of the addresses not covered by any operator whereas Cape Breton County has only 2% of the addresses not covered by an operator.

In terms of absolute numbers, Figure 7 shows the breakdown per county of coverage, including addresses not covered by any operator:

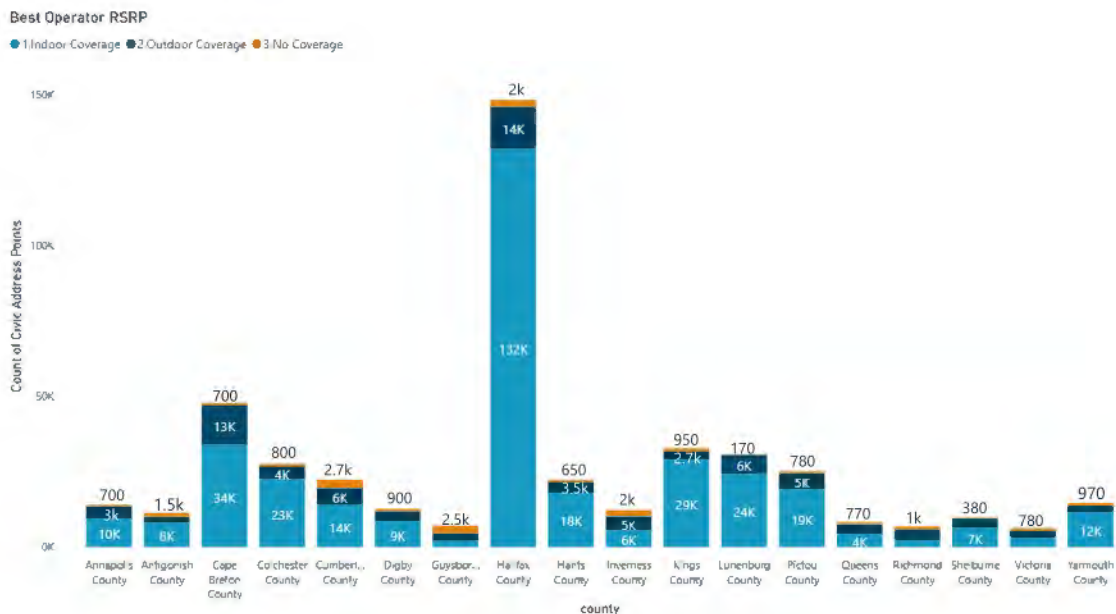


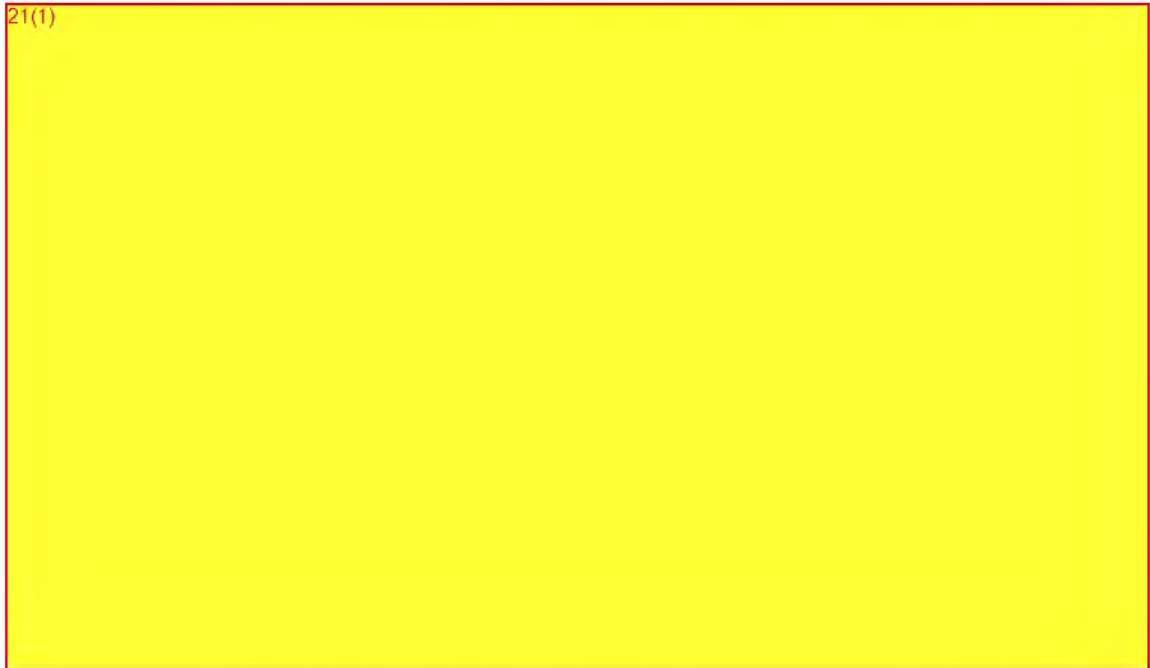
Figure 7: Civic Address Coverage by any Operator

This shows that Cumberland County, Guysborough County, Halifax County and Inverness County all have over 2,000 uncovered civic addresses each and represent the largest geographic uncovered areas.

2.3.3. Road Coverage

Figure 8 presents the indoor and outdoor coverage along the primary roads of the province for each operator. This shows, for example, ²¹⁽¹⁾

²¹⁽¹⁾ in the case of roads, the indoor coverage can be considered equivalent to the coverage that can be obtained while inside a vehicle.



This is also represented in the mapping portal by the length of road where coverage is available from at least one operator as shown in Figure 9.

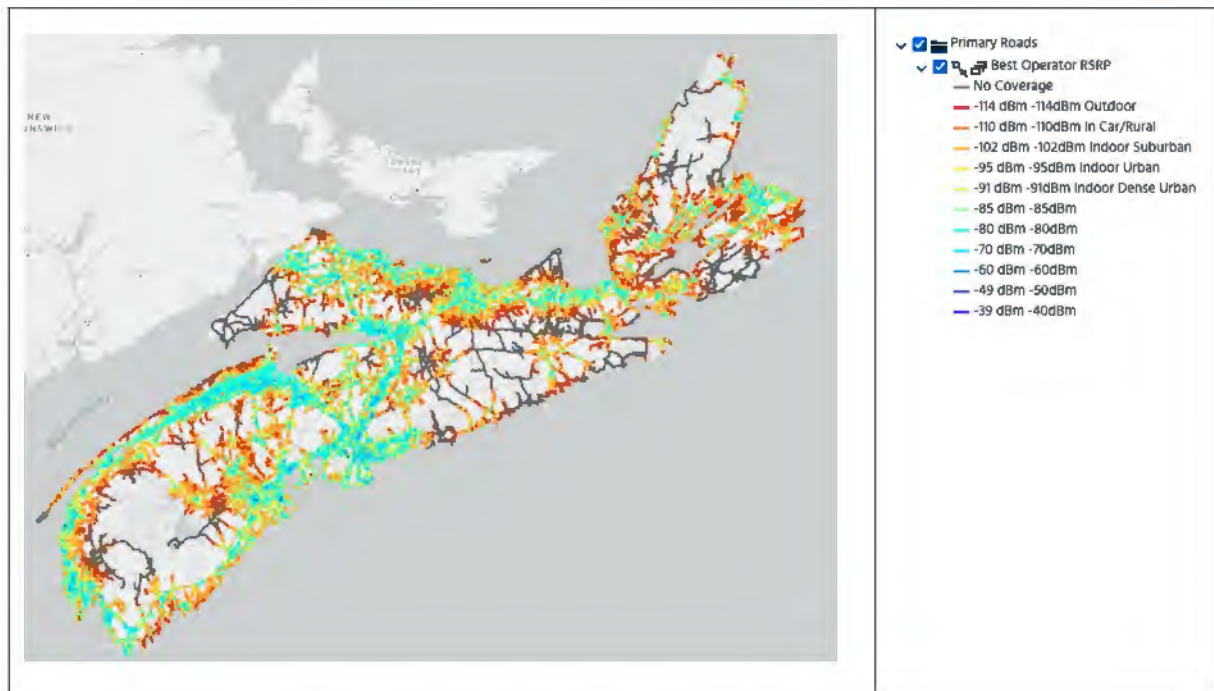


Figure 9: Primary Road Coverage by Best Operator

Figure 9 shows areas of no coverage on the 209 in Cumberland County, cross-province routes in the north east (374, 348), the 245 in Antigonish, the 316 in Guysborough County, Richmond and through Inverness County. Approximately 100km of the 298km Cabot Trail is also shown as uncovered by any operator.

Figure 10 presents the primary road % coverage from any operator, broken down by county.

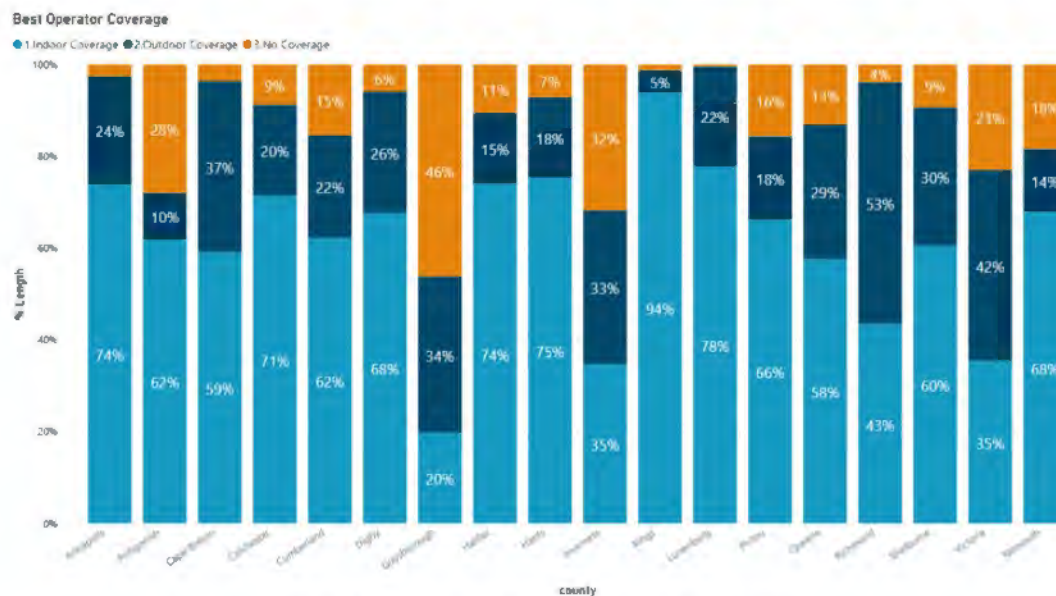


Figure 10: Primary Road % coverage by any operator

This shows, for example, that Guysborough County has 46% of its primary roads not covered by any operator whereas Cape Breton County has only 4% of its primary roads not covered by an operator.

In terms of absolute numbers, Figure 11 shows the breakdown per county of primary roads not covered by an operator in kms:

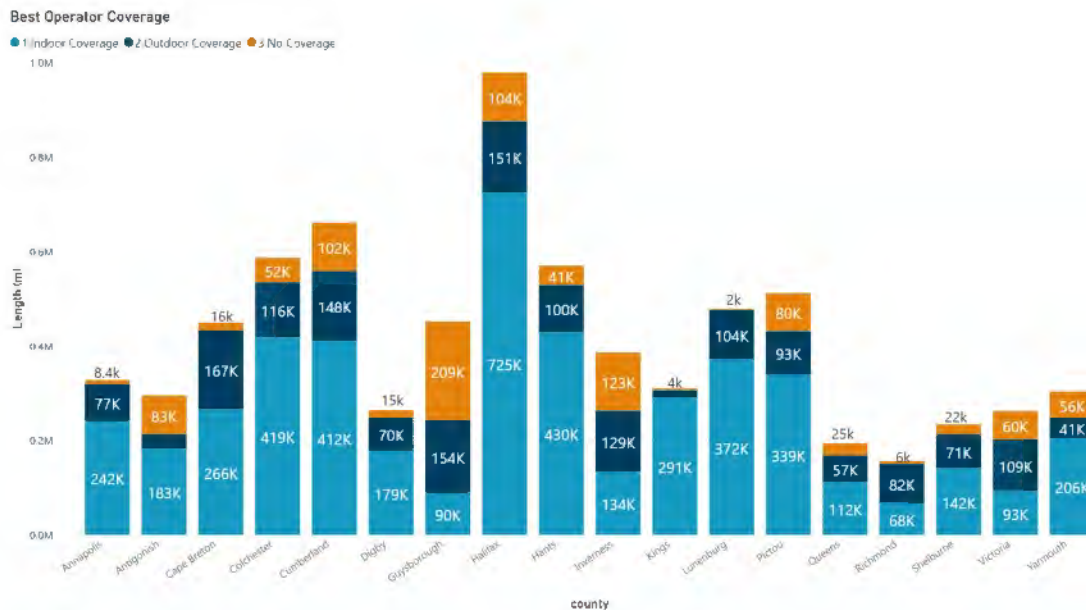


Figure 11: Primary Road coverage by any operator

This shows that Antigonish (83km), Cumberland (102km), Guysborough (209km), Halifax (104km), Inverness (123km) and Pictou (80km) are the counties with the most unserved primary roads.

2.4. Conclusions

The desktop coverage analysis carried out, based on the existing tower sites spread across the province, shows a range of civic addresses and road routes with no coverage from any operator. There are large clusters in certain areas and more dispersed pockets of no coverage throughout the province. As expected, the main population centres are better covered than the more rural areas.

The total number of civic addresses with no coverage amounts to 21,143 out of a total 461,000 addresses in the province (4.6%). If we assume that a cell tower could provision a maximum of 1,000 subscribers, then in theory, approximately 21 new tower sites could cover all the unserved addresses. However, that assumes that all 21,000 addresses would be within coverage of these 21 sites, which will not be the case in practice as these addresses are dispersed across the province.

Section 4 outlines the approach used by the planning software to determine how best to serve the maximum number of unserved addresses with the least number of new towers.

Prior to this, Section 3 describes the drive surveys which were undertaken to augment the coverage planning.

3. Drive Surveys

3.1. Approach

To complement the desktop prediction analysis, drive surveys were carried out by DNS staff using FarrPoint's cellular coverage equipment installed on vehicles driven on chosen routes. This equipment automatically measures the strength of all cellular operators as the vehicle is driven and transfers the data to the FarrPoint mapping portal. The routes driven were as follows:

- Route 1 – Cabot Trail;
- Route 2 – Cape Breton;
- Route 3 – Cumberland;
- Route 4 – Annapolis – West Hants;
- Route 5 – Digby Neck;
- Route 6 – Pictou – Antigonish;
- Route 7 – South West;
- Route 8 – Truro – Guysborough.

3.1.1. Cabot Trail

This route follows the coast around Cape Breton peninsula. It encompasses a number of areas of predicted poor coverage from any operator including significant stretches of primary road north of Petit Étang at the west side and north of Goose Cove on the east side



Figure 12: Cabot Trail Drive Route

3.1.2. Cape Breton

The route follows the west coast of the Bras d'Or lake, then travels inland to the south towards Grande Anse. From there, the route goes east to St Peter's and on to Framboise. A section of road is driven between Framboise and Stirling. The route then goes on to skirt both sides of the Grand Mira lake and back along the south-east Atlantic coast to Framboise. This route encompasses many areas of poor and no coverage from any operator.

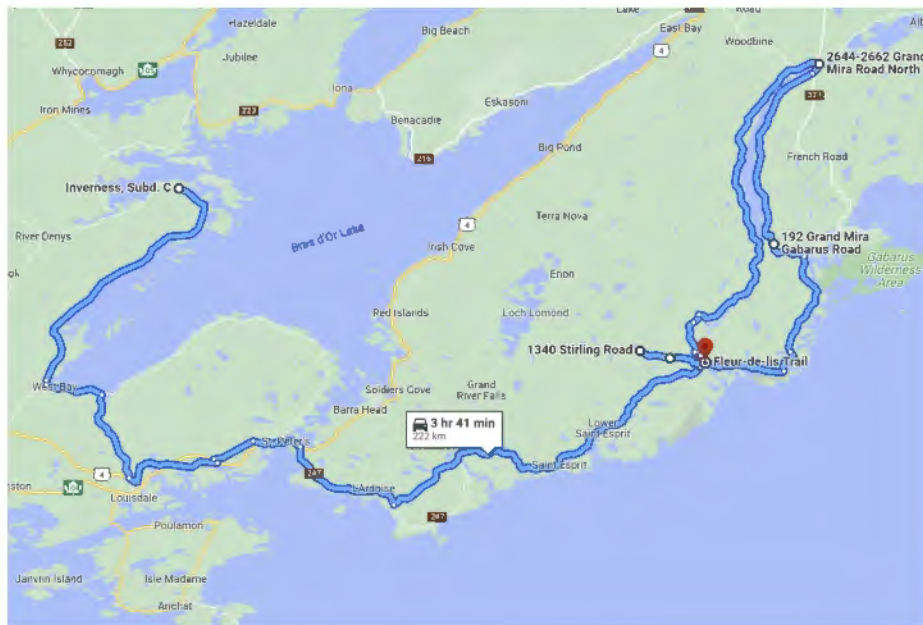


Figure 13: Cape Breton Drive Route

3.1.3. Cumberland

Two drive routes were chosen in Cumberland. These include a loop around the area of Red River and a leg east towards Parrsboro, then north to Southampton and on to Amherst. The second route is centred around Earlstown. Large parts of these routes were predicted to have little or no coverage.

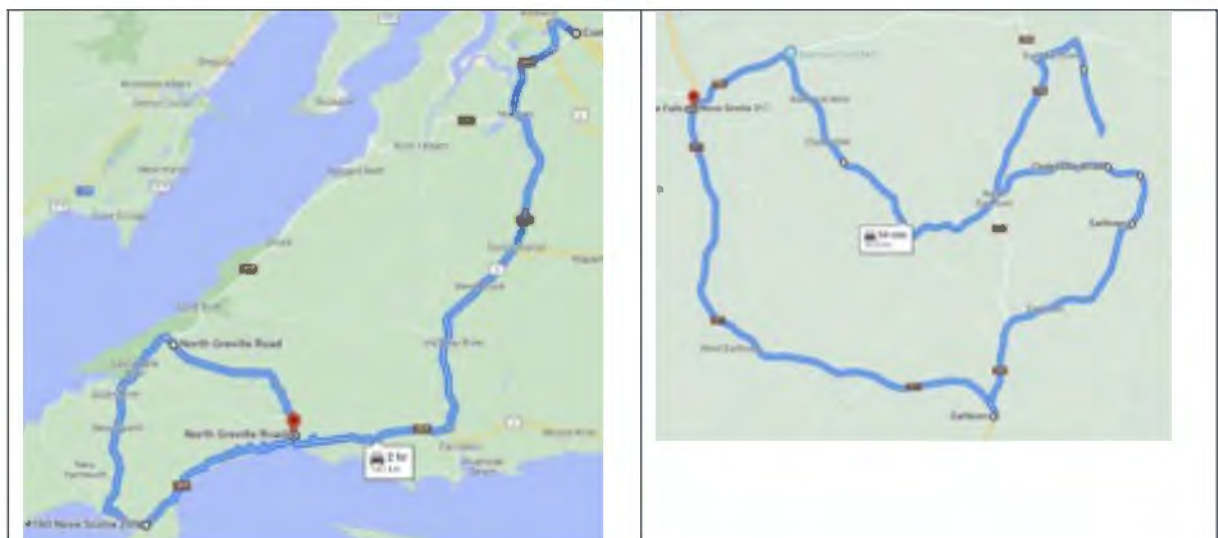


Figure 14: Cumberland Drive Routes

3.1.4. Annapolis – West Hants

This route follows the coast from Cheverie in the west to Tennycape in the east and also a southerly route from Walton to Cogmagun River. The majority of this route was predicted to have no coverage.

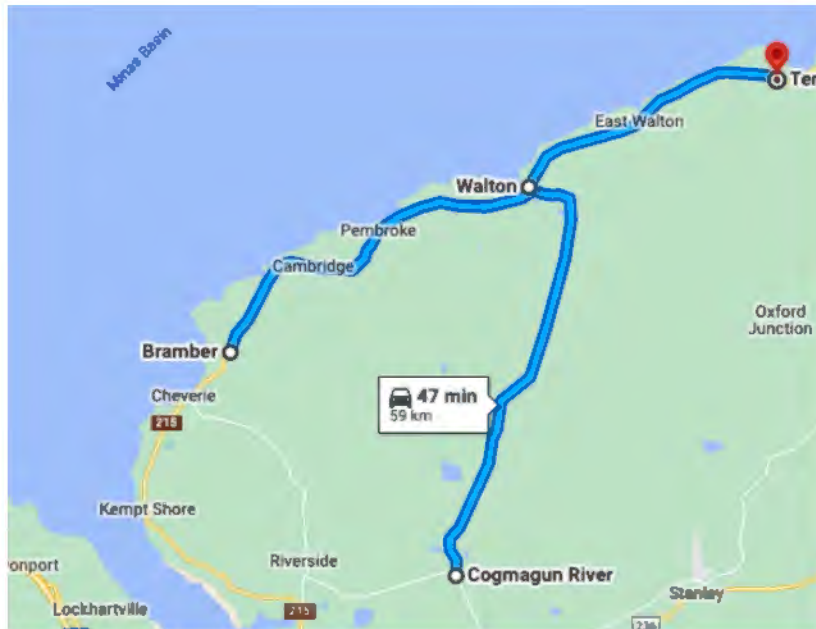


Figure 15: Annapolis – West Hants Drive Route

3.1.5. Digby Neck

This route follows the Digby Neck peninsula. Coverage was predicted to be poor with no coverage at the southern-most tip.



Figure 16: Digby Neck Drive Route

3.1.6. Pictou – Antigonish

The route follows the coast road from Arisaig in the west to Antigonish at the north-east tip, then takes a loop south to West Lakevale and on to Maryvale and finally north to Malignant Cove. Most of this route was predicted to have no coverage.



Figure 17: Pictou - Antigonish Drive Route

3.1.7. South West

The drive route goes east from Carleton towards Shelbourne, then along the 103 to Liverpool where there is a loop to the north-west via Lake Rossignol and Pleasantfield then back to Liverpool. The road east from Carleton and the loop north-west of Liverpool were predicted to have poor or no coverage.

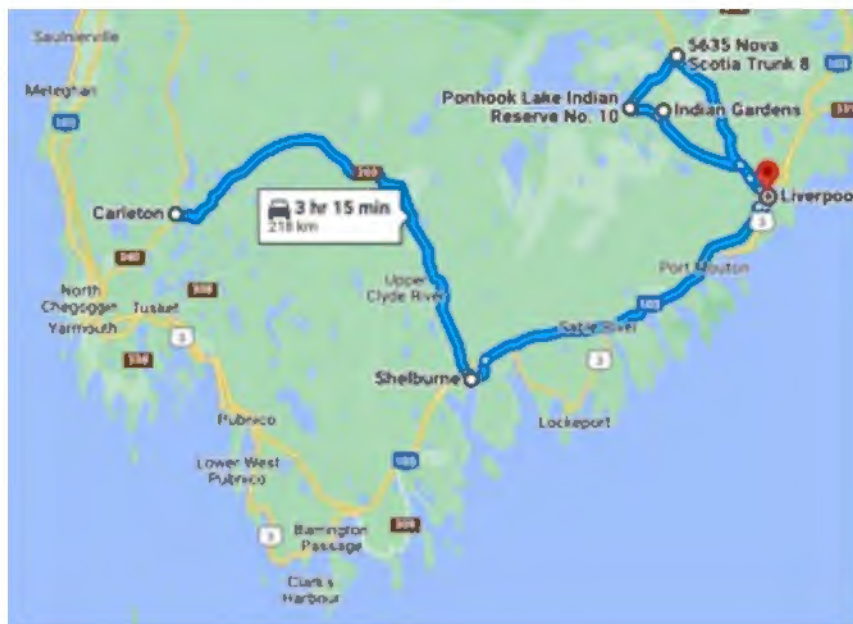


Figure 18: South West Drive Route

3.1.8. Truro – Guysborough

The route goes east along the coast from Musquodoboit Harbour towards Sheet Harbour, then continues east along the coast to Larry's River where the route goes north towards Guysborough. From Guysborough, the route goes west inland towards South Lochaber then on towards Lorne, where it then turns south back to Sheet Harbour. A significant portion of this route was predicted to have poor or no coverage.



Figure 19: Truro - Guysborough Drive Route

3.2. Updated Results

The results in this section show the predicted "best operator" signal level alongside the drive survey maps for each route. The predicted maps show areas where there was no usable signal predicted by any operator in grey. The drive survey maps show the areas with zero operators in red. The grey areas on the predicted maps can be taken as approximately equivalent to the red areas on the drive survey maps.

3.2.1. Cabot Trail

Figure 20 shows the predicted coverage along the Cabot Trail route, with the areas of no coverage from any operator coloured in grey. Figure 21 shows the result of the drive surveys on the route. The results show that the areas of poor and no coverage largely follow the predicted coverage plot.



- ☒ Primary Roads
- ☒ Best Operator RSRP
 - No Coverage
 - 114 dBm -114dBm Outdoor
 - 110 dBm -110dBm In Car/Rural
 - 102 dBm -102dBm Indoor Suburban
 - 95 dBm -95dBm Indoor Urban
 - 91 dBm -91dBm Indoor Dense Urban
 - 85 dBm -85dBm
 - 80 dBm -80dBm
 - 70 dBm -70dBm
 - 60 dBm -60dBm
 - 49 dBm -50dBm
 - 39 dBm -40dBm

Figure 20: Predicted Coverage around Cabot Trail Drive Route



- ☒ Outdoor Coverage (>05dBm)
- ☒ DNS2_mobile_120k_opscount_105
 - 3 Ops
 - 2 Ops
 - 1 Op
 - Zero Ops

Figure 21: Drive Survey Results around Cabot Trail Drive Route

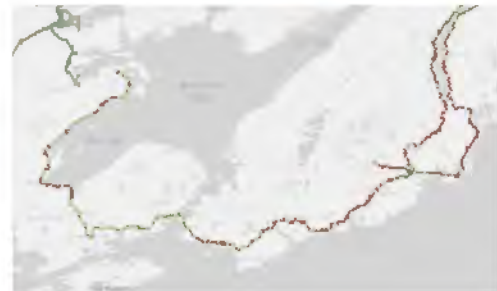
3.2.2. Cape Breton

Figure 22 shows the predicted coverage along the Cape Breton route, with the areas of no coverage from any operator coloured in grey. Figure 23 shows the result of the drive surveys on the route. The results show that the areas of poor and no coverage largely follow the predicted coverage plot. However, coverage does exist around the Framboise area from all three operators in an area that was predicted to have no coverage. It is likely this is due to a newly commissioned cell tower in this area that did not exist in the government database at the time of downloading.



- ✓ ☒ Primary Roads
- ✓ ☒ Best Operator RSRP
 - No Coverage
 - -114 dBm -114dBm Outdoor
 - -110 dBm -110dBm In Car/Rural
 - -102 dBm -102dBm Indoor Suburban
 - -95 dBm -95dBm Indoor Urban
 - -91 dBm -91dBm Indoor Dense Urban
 - -85 dBm -85dBm
 - -80 dBm -80dBm
 - -70 dBm -70dBm
 - -60 dBm -60dBm
 - -49 dBm -50dBm
 - -39 dBm -40dBm

Figure 22: Predicted Coverage around Cape Breton

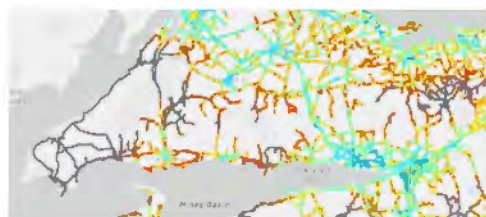


- ✓ ☒ Outdoor Coverage (-105dBm)
- ✓ ☒ DNS2_mobile_t20k_opscount_105
 - 3 Ops
 - 2 Ops
 - 1 Op
 - Zero Ops

Figure 23: Drive Survey Results around Cape Breton

3.2.3. Cumberland

Figure 24 shows the predicted coverage along the Cumberland route, with the areas of no coverage from any operator coloured in grey. Figure 25 shows the result of the drive surveys on the route. The results show that the areas of poor and no coverage largely follow the predicted coverage plot.



- ✓ ☒ Primary Roads
- ✓ ☒ Best Operator RSRP
 - No Coverage
 - -114 dBm -114dBm Outdoor
 - -110 dBm -110dBm In Car/Rural
 - -102 dBm -102dBm Indoor Suburban
 - -95 dBm -95dBm Indoor Urban
 - -91 dBm -91dBm Indoor Dense Urban
 - -85 dBm -85dBm
 - -80 dBm -80dBm
 - -70 dBm -70dBm
 - -60 dBm -60dBm
 - -49 dBm -50dBm
 - -39 dBm -40dBm

Figure 24: Predicted Coverage around Cumberland



Figure 25: Drive Survey Results around Cumberland

3.2.4. Annapolis – West Hants

Figure 26 shows the predicted coverage along the Annapolis-West Hants route, with the areas of no coverage from any operator coloured in grey. Figure 27 shows the result of the drive surveys on the route. Coverage on the eastern section of the route is better than predicted. This is likely due to one or more newly commissioned cell towers in this area that did not exist in the government database at the time of downloading.



- ✓ ☒ Primary Roads
- ✓ ☒ Best Operator RSRP
 - No Coverage
 - -114 dBm -114dBm Outdoor
 - -110 dBm -110dBm In Car/Rural
 - -102 dBm -102dBm Indoor Suburban
 - -95 dBm -95dBm Indoor Urban
 - -91 dBm -91dBm Indoor Dense Urban
 - -85 dBm -85dBm
 - -80 dBm -80dBm
 - -70 dBm -70dBm
 - -60 dBm -60dBm
 - -49 dBm -50dBm
 - -39 dBm -40dBm

Figure 26: Predicted Coverage around Annapolis – West Hants



- ✓ ☒ Outdoor Coverage (-105dBm)
- ✓ ☒ DNS2_mobile_120k_opscount_105
 - 3 Ops
 - 2 Ops
 - 1 Op
 - Zero Ops

Figure 27: Drive Survey Results around Annapolis – West Hants

3.2.5. Digby Neck

Figure 28 shows the predicted coverage along the Digby Neck route, with the areas of no coverage from any operator coloured in grey. Figure 29 shows the result of the drive surveys on the route. The results show that the areas of poor and no coverage largely follow the predicted coverage plot. However, some coverage exists at the southern-most tip of the peninsula that wasn't predicted. This is likely due to a newly commissioned site that did not exist in the government database at the time of downloading.

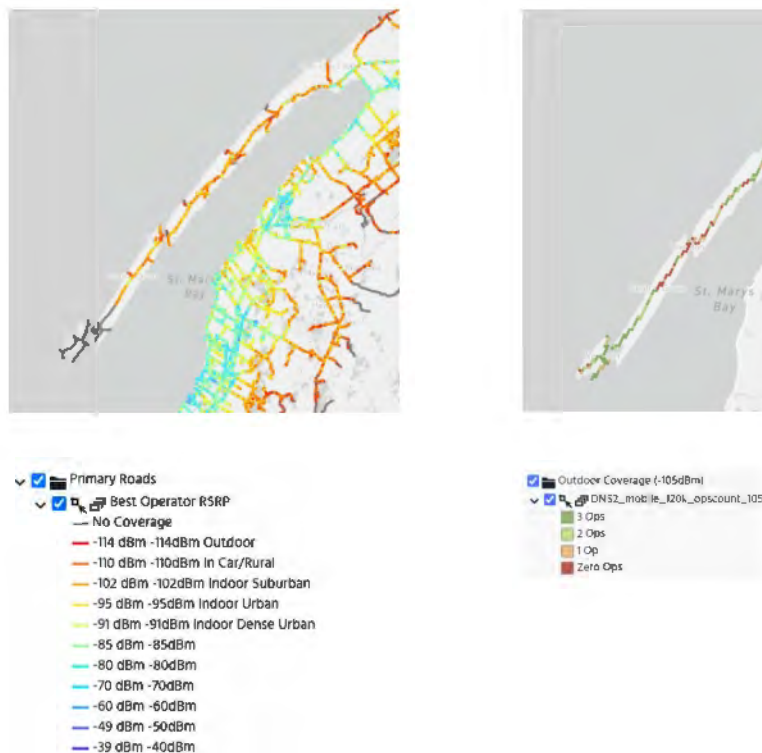
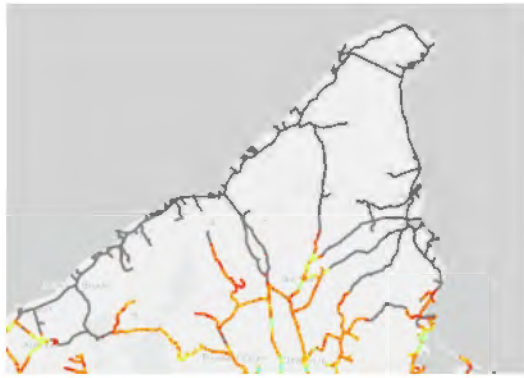


Figure 28: Predicted Coverage around Digby Neck

Figure 29: Drive Survey Results around Digby Neck

3.2.6. Pictou – Antigonish

Figure 30 shows the predicted coverage along the Pictou - Antigonish route, with the areas of no coverage from any operator coloured in grey. Figure 31 shows the result of the drive surveys on the route. The majority of this route was predicted to have no coverage. The actual coverage measured is in some areas an improvement on that predicted. This is likely due to newly commissioned towers that were not in the government database at the time of downloading.



- ✓ ☒ Primary Roads
- ✓ ☒ Best Operator RSRP
 - No Coverage
 - -114 dBm -114dBm Outdoor
 - -110 dBm -110dBm in Car/Rural
 - -102 dBm -102dBm Indoor Suburban
 - -95 dBm -95dBm Indoor Urban
 - -91 dBm -91dBm Indoor Dense Urban
 - -85 dBm -85dBm
 - -80 dBm -80dBm
 - -70 dBm -70dBm
 - -60 dBm -60dBm
 - -49 dBm -50dBm
 - -39 dBm -40dBm

Figure 30: Predicted Coverage around Pictou - Antigonish



- ✓ ☒ Outdoor Coverage (-105dBm)
- ✓ ☒ DNS2_mobile_120k_opscount_105
 - 3 Ops
 - 2 Ops
 - 1 Op
 - Zero Ops

Figure 31: Drive Survey Results around Pictou - Antigonish

3.2.7. South West

Figure 32 shows the predicted coverage along the South West route, with the areas of no coverage from any operator coloured in grey. Figure 33 shows the result of the drive surveys on the route. The results show that the areas of poor and no coverage largely follow the predicted coverage plot.

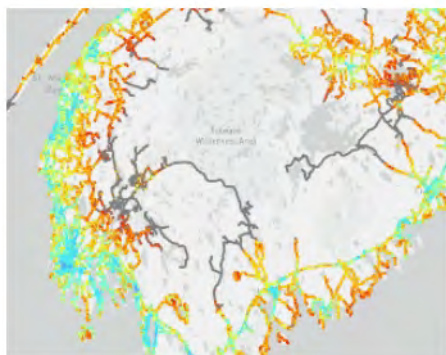




Figure 32: Predicted Coverage around South West

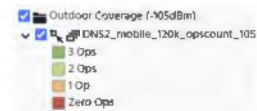


Figure 33: Drive Survey Results around South West

3.2.8. Truro – Guysborough

Figure 34 shows the predicted coverage along the Truro – Guysborough route, with the areas of no coverage from any operator coloured in grey. Figure 35 shows the result of the drive surveys on the route. The results show that the areas of poor and no coverage largely follow the predicted coverage plot.



Figure 34: Predicted Coverage around South West



Figure 35: Drive Survey Results around South West

3.3. Conclusions

The drive surveys confirm that the areas of predicted poor or no coverage are accurate with the following exceptions:

- Cape Breton – Coverage exists around the Framboise area that was not predicted;
- Annapolis – West Hants – Coverage exists on the eastern leg of the drive route that was not predicted;
- Digby Neck – Coverage exists at the southern tip of the peninsula that was not predicted;
- Pictou – Antigonish – Coverage exists on the western leg of drive route and at the eastern tip of the peninsula that was not predicted.

The remaining areas will be considered within the infill solutions in Section 4.

4. Infill Solutions

4.1. Introduction

The analysis has shown a number of areas of poor coverage across the province. This can take the form of 'total not-spots' where there is no coverage from any provider or 'partial not-spots' where there is coverage from at least one provider but not all three. To a customer of one of these absent providers, this location would also be seen as a not-spot.

In order to look at options to address these poor coverage areas, and specifically the total not-spots, potential new infill sites were investigated to determine what locations would provide the most benefit in terms of increased coverage.

4.2. Approach

New tower locations were determined using FarrPoint's HTZ Communications radio planning software which was programmed to determine the best location of towers to cover the most unserved addresses. Radio propagation models were developed to provide coverage analysis from these new locations. The tower parameters used were similar to neighbouring towers in terms of frequency and channel bandwidth with height and power being optimised for each location.

The planning software will continue to identify new tower sites until all unserved addresses are connected, even if that means the last few towers only have one or two subscribers, which is clearly uneconomic. A threshold is needed and in this case a threshold of 20 connected subscribers was used at which point the software would stop identifying further new tower sites.

4.3. Costs

Budgetary capital costs for new tower locations have been developed based on the following cost elements:

- Tower structure;
- Land cost;
- Tower build;
- Access cost and power provision;
- Backhaul provision;
- LTE equipment.

The capital costs provide an indication of the scale of investment that would be required at each new tower location. The allocation of costs between government subsidy and commercial operator is not made and would be subject to the design of any intervention that may be planned.

The cost breakdown is as follows:

Item	Unit cost	Comment
14(1); 17(1)		

This gives a budgetary cost of 14(1); 17(1) per tower. The most significant factor is the access cost and power provision, and this has been investigated further for each new tower location identified.

4.4. Results

4.4.1. Initial Results

The initial results of the planning exercise show that 75 new tower locations would cover an additional 15,516 civic addresses of the 21,143 which are unserved.

However, the planning software places sites with no regard to how practical these locations may be in terms of access to nearby services or suitability of location e.g. within a national park etc. In order to check and refine these locations, a manual review was conducted of each location and adjustments made as necessary.

4.4.2. Final Results

The final results of the planning exercise show the following potential new tower locations, ordered by the number of unserved addresses which are now covered:

Ref	Station #	Site Location	Longitude 4DMS	Latitude 4DMS	No. connected sub	Ref	Station #	Site Location	Longitude 4DMS	Latitude 4DMS	No. connected sub
1	14	Cape D'Or Road	64°45'22.3"W	45°18'55.4"N	761	39	35	Hampton, Annapolis County	65°21'06.0"W	44°54'17.3"N	160
2	19	E side lake Charlotte	62°57'53.7"W	44°47'24.8"N	658	40	64	NE Economy	63°52'11.2"W	45°23'19.8"N	159
3	18	NW Wellington, Lunenburg Cty	64°51'01.6"W	44°19'47.2"N	646	41	24	S Garden of Eden	62°17'43.4"W	45°24'31.2"N	152
4	9	E Margaree Centre, CB	60°56'51.3"W	46°21'13.1"N	604	42	54	Grand River, Richmond Cty	60°39'27.1"W	45°38'55.3"N	146
5	21	E Carlton, Yarmouth cty	65°54'15.7"W	44°00'22.4"N	499	43	69	Margaretsville, Kings County	65°03'53.9"W	45°02'55.0"N	144
6	27	Tidnish	64°01'17.0"W	45°58'56.2"N	466	44	41	Drum Head, Goldboro	61°36'10.6"W	45°08'59.6"N	143
7	15	Freeport, Digby Neck	66°19'33.8"W	44°15'57.8"N	457	45	46	W Pleasant Bay	60°48'28.6"W	46°49'37.6"N	143
8	10	Ballantynes Cove, Cape George	61°54'35.2"W	45°51'49.5"N	429	46	3	NE of Diligent River	64°25'42.2"W	45°27'00.4"N	142
9	7	NE River Hebert	64°21'27.1"W	45°42'20.0"N	425	47	29	W Lake Paul, Kings County	64°40'42.4"W	44°51'56.4"N	142
10	11	N Lochaber, E side of lake	62°01'01.3"W	45°26'03.4"N	359	48	32	Lake George, Kings County	64°41'19.0"W	44°55'41.0"N	141
11	45	S West Quoddy	62°20'60.0"W	44°53'32.1"N	333	49	53	North River Bridge, CB	60°37'27.3"W	46°18'37.7"N	141
12	26	E Ecum Secum Harbour	62°08'56.7"W	44°57'53.7"N	311	50	43	S East Lake Ainslie	61°08'34.9"W	46°05'35.7"N	123
13	16	W Upper Stewiacke	63°02'33.7"W	45°12'09.6"N	306	51	60	S Burtons,	63°34'09.2"W	45°13'18.0"N	123
14	39	E Larry's River, Guysborough	61°22'27.5"W	45°13'36.1"N	291	52	62	Erinville, Guysborough Cty	61°44'00.3"W	45°22'10.9"N	119
15	12	St. Francis Harbour, Guysborough	61°18'23.2"W	45°26'32.4"N	282	53	67	N Waddens Cove	59°51'39.6"W	46°05'35.9"N	119
16	68	Lower Cove	64°26'05.2"W	45°43'38.4"N	259	54	61	Eliscomb mills	62°02'58.5"W	45°00'17.7"N	118
17	37	Little Harbour, Halifax County	62°50'33.4"W	44°42'59.5"N	255	55	74	NW Richfield, Yarmouth Cty	65°58'34.7"W	44°07'47.6"N	117
18	42	Malignant Cove	62°04'31.2"W	45°47'34.2"N	250	56	47	East River Saint Marys	62°08'39.7"W	45°23'02.4"N	114
19	33	SE East Jeddore	63°00'31.5"W	44°43'15.2"N	241	57	31	Guysborough Intervale	61°34'14.4"W	45°27'09.7"N	112
20	34	Moser River	62°15'02.2"W	44°58'43.6"N	232	58	51	N Forchu, CB	60°15'37.0"W	45°43'13.8"N	111
21	6	Lorneville	63°56'37.0"W	45°59'19.1"N	231	59	52	Bear River, Annapolis Cty	65°38'03.5"W	44°34'29.0"N	111
22	23	NE Arisaig	62°08'33.3"W	45°46'10.5"N	225	60	63	E Centre Musquodoboit	62°59'54.5"W	45°06'54.8"N	109
23	8	SE River Denys	61°06'07.4"W	45°47'37.7"N	219	61	44	Petit de Gras	60°56'09.1"W	45°30'01.7"N	106
24	2	Westbrook, North of Parrsboro	64°17'23.0"W	45°34'16.0"N	211	62	72	SE Lower Ship Harbour	62°48'38.5"W	44°46'22.9"N	100
25	36	SE Loch Lomond	60°33'57.6"W	45°45'59.4"N	210	63	50	W Earlton	63°08'15.7"W	45°34'45.6"N	98
26	30	NE Goshen	61°57'29.9"W	45°22'40.3"N	206	64	55	E South West Margaree	61°09'49.2"W	46°16'48.0"N	86
27	22	SW Sunnybrae, Mid NS	62°30'53.8"W	45°23'46.5"N	203	65	73	SE Bangs Falls	64°49'22.3"W	44°14'27.3"N	84
28	17	Morden, Kings County	64°56'46.2"W	45°06'08.6"N	198	66	59	Apple River, Cumberland County	64°47'08.9"W	45°27'41.3"N	79
29	20	Port Bickerton, Guysborough Cty	61°43'55.7"W	45°06'13.1"N	195	67	49	NE Lismore	62°14'50.1"W	45°42'52.3"N	75
30	75	West Bay East side, N point	60°57'32.4"W	45°45'55.4"N	189	68	48	Point Aconi	60°19'03.6"W	46°19'20.6"N	66
31	4	Cambridge, Noel Shore	64°06'20.3"W	45°12'05.9"N	186	69	1	West of Lower River Hebert	64°22'14.1"W	45°43'35.5"N	65
32	28	Walton, Noel Shore	64°00'23.2"W	45°13'23.8"N	186	70	57	W Bay St. Lawrence	60°29'18.3"W	46°59'54.2"N	62
33	65	Kempt Back Lake	65°50'03.1"W	44°02'52.1"N	185	71	70	NE Caledonia	62°23'43.8"W	45°16'49.1"N	54
34	13	Port Felix, Guysborough	61°13'08.0"W	45°15'00.0"N	184	72	66	Indian Harbour Lake	61°52'22.7"W	45°07'46.6"N	52
35	38	NW New Harbour West, Guysborough	61°30'26.4"W	45°12'14.7"N	175	73	5	Minasville, Noel Shore	63°49'24.8"W	45°16'42.8"N	48
36	56	E East Quinan	65°47'06.8"W	43°56'42.5"N	171	74	71	S New Salem, Cumberland Cty.	64°47'37.4"W	45°24'45.2"N	47
37	25	West side Grand Mira South	60°17'18.4"W	45°53'36.8"N	165	75	58	South Ingonish Harbour	60°25'55.4"W	46°37'37.5"N	38
38	40	Englishtown	60°32'33.6"W	46°16'59.2"N	164						

Plotting the profile of sites against the number of addresses covered shows the following profile:

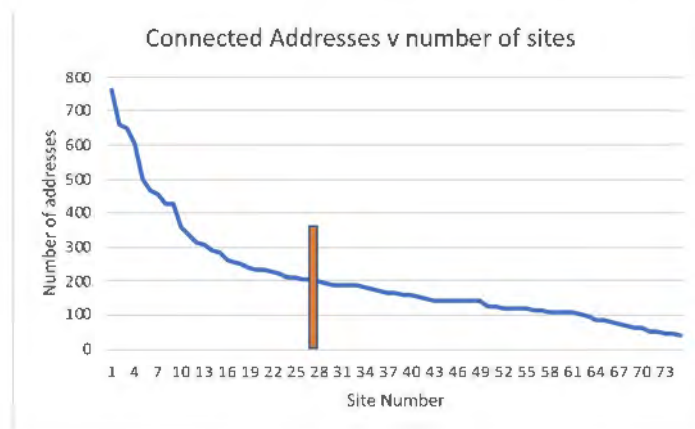


Figure 36: Number of Addresses Covered by Sites Profile

This shows that after around 27 new towers (shown in the figure by an orange bar), the number of additional addresses covered starts to flat line and so in terms of reducing benefit, this could present a cut-off point.

However, the drive surveys suggest that two of these sites may not be needed, site Ref 7 at Freeport and site Ref 8 at Ballantynes Cove. This then reduces the number of new towers to 25.

This would mean that the top 25 sites could become an initial focus as they provide the most benefit in terms of covering the maximum number of addresses per tower. These 25 new towers would cover an additional 9,569 premises of the 21,143 premises with no coverage.

4.4.3. Costs

The costs for these top 25 sites have been estimated by assessing their location in terms of access costs and power which were the two most significant variants as described previously.

This then gives an estimated cost for these 25 towers as follows, with the total for 73 sites (initial 75 minus the two sites not needed) for comparison:

Item	Top 25 sites	All 73 sites	Comment
14(1), 17(1)			

4.5. Coverage Improvements

The improvement in coverage from these new tower sites is shown below.

4.5.1. Address Coverage

Figure 37 shows the initial predicted address coverage with Figure 38 showing the additional locations covered with the inclusion of the 25 new sites. For comparison, Figure 39 shows the improved address coverage from all 73 sites.

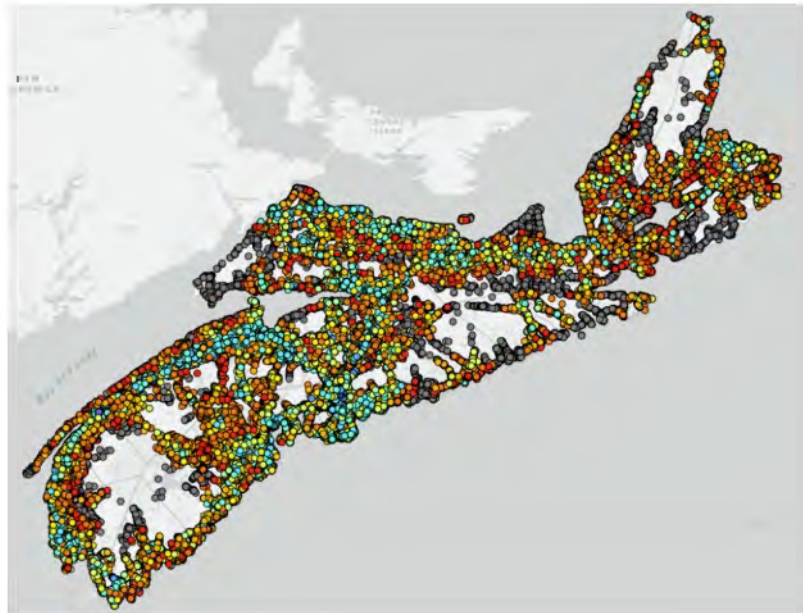


Figure 37: Initial Address Coverage



Figure 38: Improved Address Coverage - 25 sites



Figure 39: Improved Address Coverage - 73 sites

Figure 40 shows the initial predicted address coverage within each county. Figure 41 shows the additional address locations covered with the inclusion of the 25 new sites. For example, Antigonish County benefits from an additional 1,466 address locations with indoor coverage and an additional 54 sites with outdoor coverage.

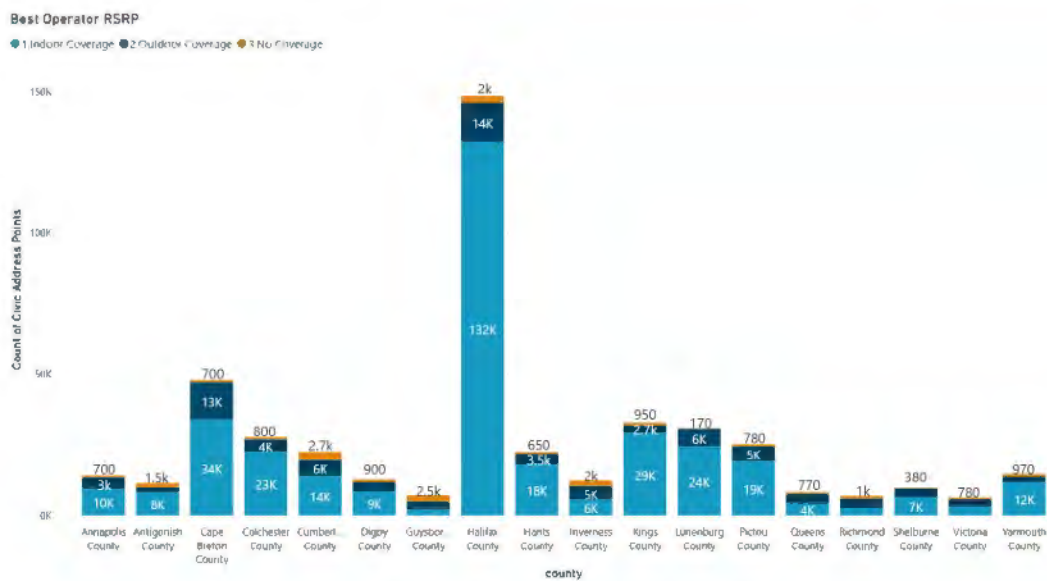


Figure 40: Initial Address Coverage by County

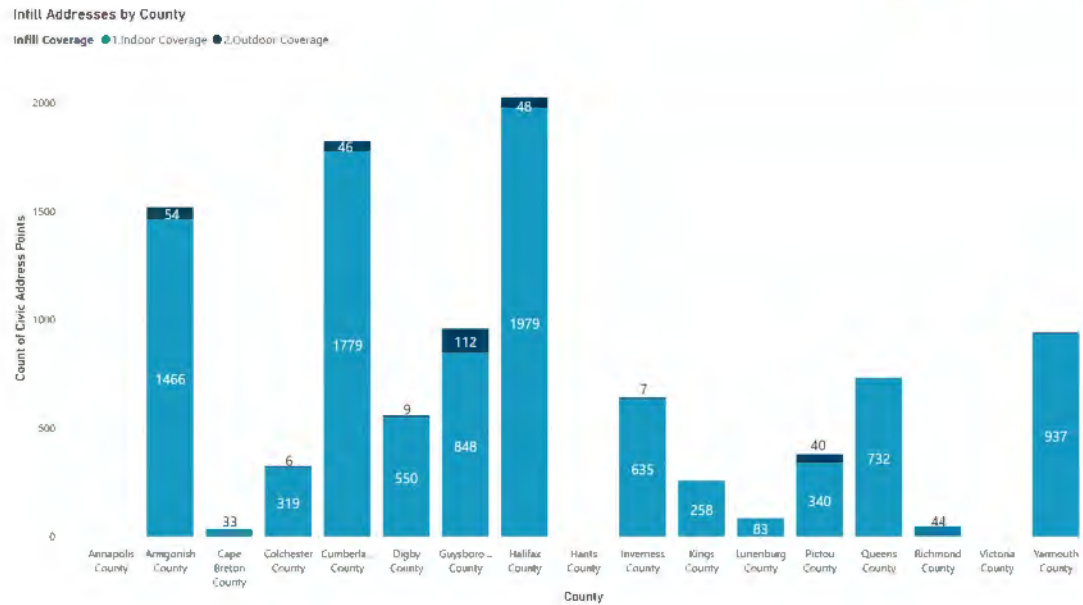


Figure 41: Improved Address Coverage by County

4.5.2. Road Coverage

Figure 42 shows the initial predicted roads coverage with Figure 43 showing the additional coverage with the inclusion of the 25 new sites and for comparison, Figure 44 shows the improved roads coverage from all 73 sites.

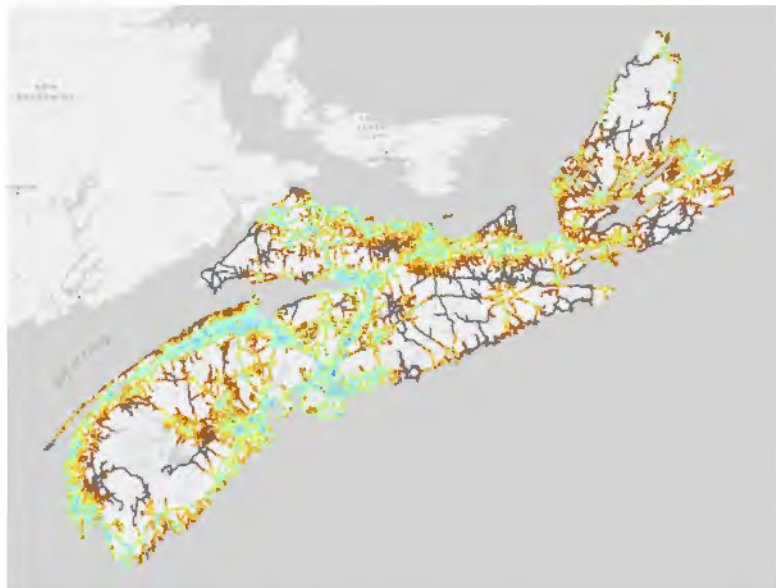


Figure 42: Initial Road Coverage

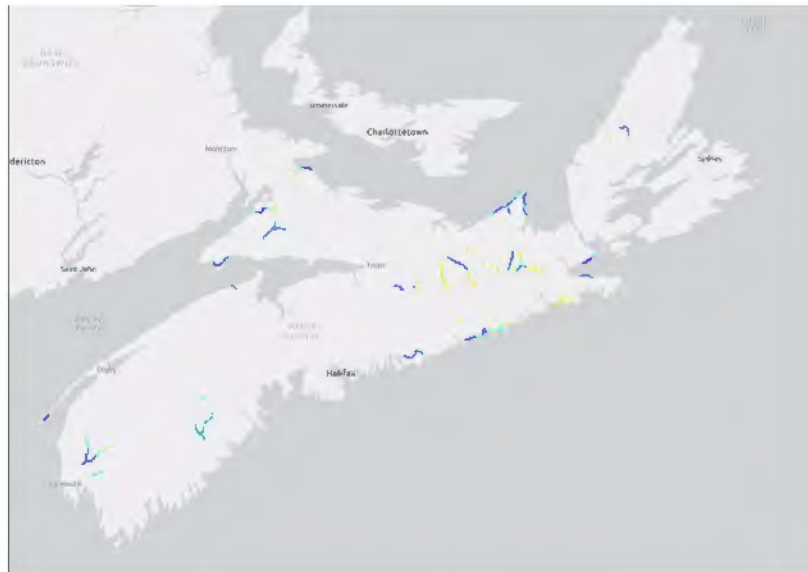


Figure 43: Improved Road Coverage - 25 sites

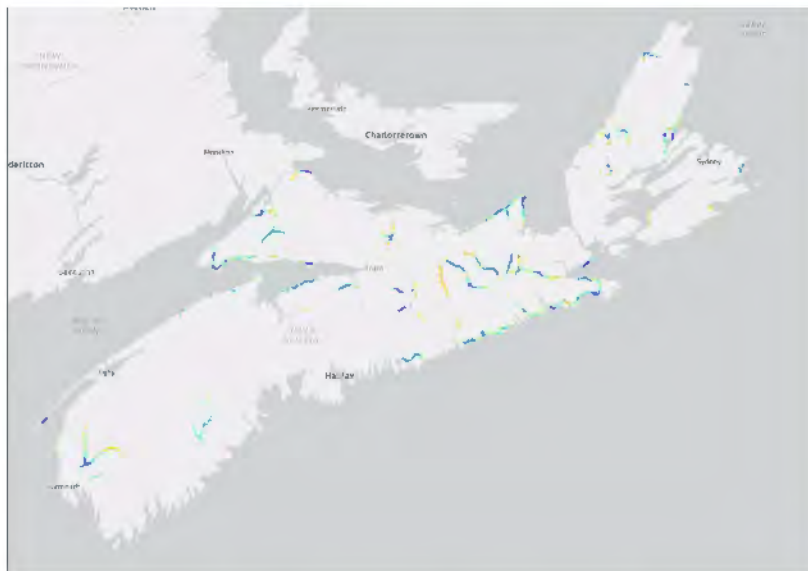


Figure 44: Improved Road Coverage - 73 sites

4.5.3. Road Coverage

Figure 45 shows the initial predicted road coverage within each county. Figure 46 shows the additional road sections covered with the inclusion of new sites. For example, Antigonish County benefits from an additional 78km of roads covered at indoor coverage levels and an additional 5km of roads at outdoor coverage level.

Best Operator Coverage

1 Indoor Coverage 2 Outdoor Coverage 3 No Coverage

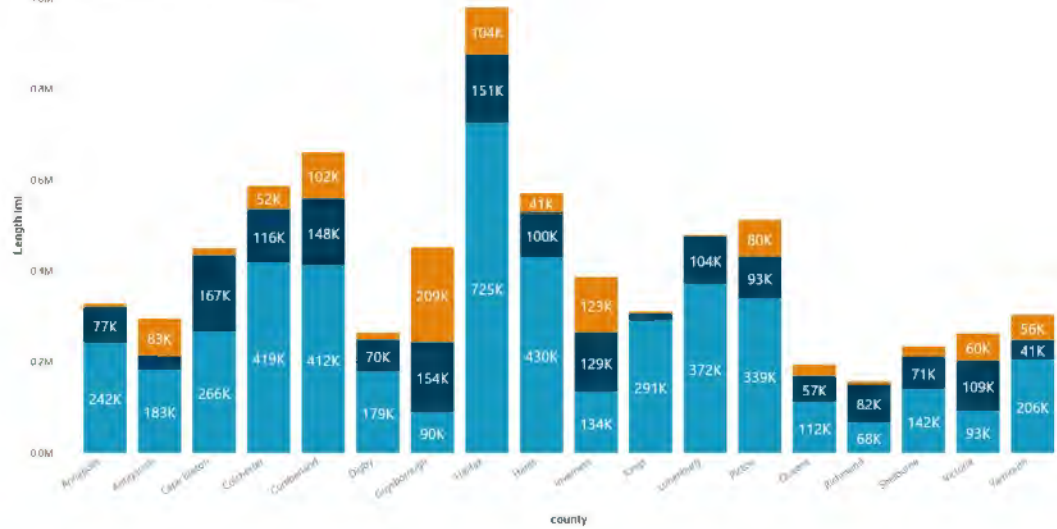


Figure 45: Initial Road Coverage by County

Infill Road Length by County

Infill Coverage 1 Indoor Coverage 2 Outdoor Coverage

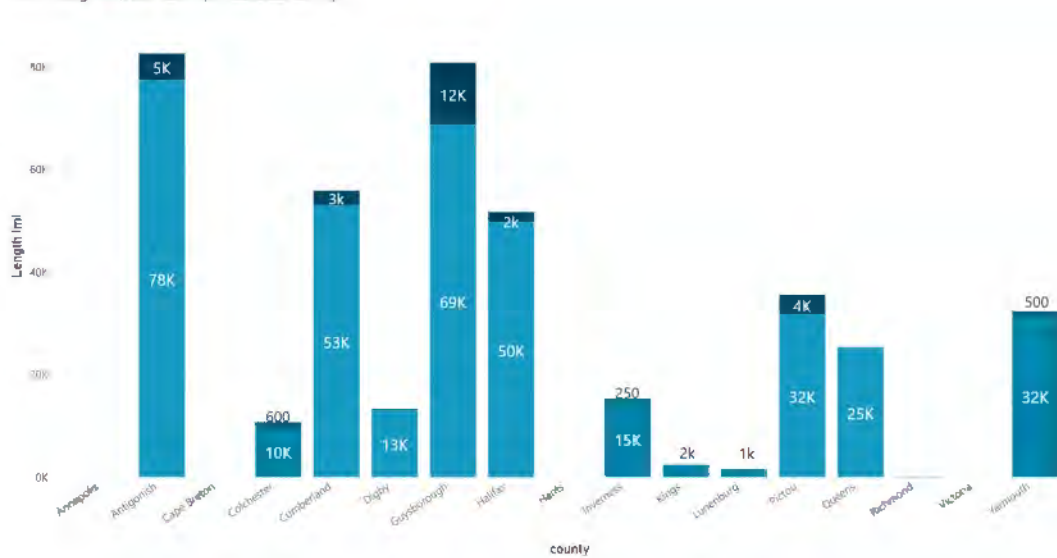


Figure 46: Improved Road Coverage by County

5. Conclusions

This study used a mix of desktop analysis and drive surveys to determine the existing cellular coverage position across the province. The results showed areas of partial and total not-spots which were spread across the province as measured by address coverage and primary and minor road coverage.

Potential new tower sites were determined which gave the best coverage of unserved addresses with the top 25 tower locations chosen as providing the best return. This is an arbitrary cut off used to limit the capital spend required and can be adjusted as necessary to build into a future business case for investment if that were required. Further modelling could be completed to focus in on certain areas of concern, for example sections of key road routes etc.

Costs for the development of these sites were built up using industry standard unit costs which when applied to the 25 sites gives a total cost of 14(1); 17(1). Costs figures have also been included for all 73 sites at 14(1); 17(1).

With these 25 new sites, a total of 9,569 of the 21,143 uncovered civic addresses could be covered and 407km of the 1,010km unserved primary roads. With 73 sites, 15,516 of the 21,143 uncovered civic addresses are covered and 772km of the 1,010km unserved primary roads.

The 75 sites chosen as a focus for this report were identified through detailed analysis that attempted to minimise costs whilst retaining a practical solution. This involved positioning of sites such that power and backhaul costs were as low as possible, whilst at the same time providing the coverage required to the priority areas. These priority areas were primarily where there are clusters of residential premises with no current cell coverage provision.

Whilst it would be possible to calculate costs for complete geographic coverage, this would inevitably require placement of sites in more remote areas with no current infrastructure or services. This would require a different approach which was outside the scope of this initial report. However, based on an approximation of the land mass without any current cell coverage, full geographic coverage may require up to a further 200 towers over and above the 73 already assessed in this report. The tower cost estimates outlined in this report indicate that a further 14(1); 17(1) could be required to fund these additional 200 towers. It should be noted however that no detailed work has been carried out to calculate this blanket coverage provision and these costs could be significantly higher due to the remote nature of the geography.

In conclusion, DNS are now in a position to better understand the existing cellular coverage across the province and the areas of poor coverage, and the scale of capital cost required to provide additional coverage.

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DEVELOP NOVA SCOTIA

Cell Gap Analysis

Final Report



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1. Introduction

This report presents the results of the Cell Gap Analysis study completed by FarrPoint for Develop Nova Scotia (DNS).

1.1. Background

The importance of excellent cell coverage is well understood across the marketplace as being a key enabler for business and social activities, whether that be on the move, at home or in the workplace. There is a global move towards increased digitalisation and a continuing need to develop and invest in the underlying infrastructure, while in parallel helping to develop digital skills in the labour force. This need has been further highlighted through the COVID pandemic as the workforce is dispersed from traditional urban settings and the issues of urban/rural divide are evident. Cellular usage is predominantly based on LTE (4G) technology as the current widely available standard. This provides good, responsive speeds which are adequate for the vast majority of use cases and with multiple handsets and packages available to allow widespread adoption.

Coverage is provided across Nova Scotia by the commercial cellular operators Bell, Rogers, Telus and Eastlink through a network of cell towers and roaming agreements. The coverage from these towers depends on technical parameters including frequency, antenna height and power which can vary by tower location and operator. The performance to the end user is also reliant on the data throughput from these towers and that again depends on the technical parameters of frequency channel and onward connectivity from the towers into the operators' networks.

Tower locations are designed on a cost/benefit basis to provide the maximum return for the operators in terms of subscriber take-up and retention. The effect of this is that in rural areas where subscriber numbers are low, or in hard to serve areas where the cost to provide is high, coverage will be less.

Good cellular provision is complementary to good, fixed broadband connectivity and is an essential part of the mix in delivering a well-connected province. DNS appointed FarrPoint to undertake a study to map out and measure the cellular connectivity capabilities across Nova Scotia.

1.2. Project Approach

The study is based on a combination of desktop analysis, complemented by on the ground measurements and analysis. This is shown in Figure 1.



Figure 1: Project Approach

1.3. Report Structure

Following this introductory section, the remainder of the report is set out as follows:

- Section 2 presents the initial desktop results of coverage;
- Section 3 describes the drive surveys undertaken and their input to the analysis;
- Section 4 presents details of the coverage infill solutions and costs;
- Section 5 provides conclusions.

2. Initial Results & Analysis

2.1. Approach

Desktop analysis was conducted of coverage using available data on tower locations, heights, frequency, channel bandwidth, and power. This detail was sourced from the Government of Canada Spectrum Management System Data and input into FarrPoint's ATDI HTZ Communications radio planning software to assess potential coverage from each tower.

The results were then input to FarrPoint's online GIS (Geographic Information System) and online mapping portal, together with an overlay of the following data sets: Civic Address points (Feb 2022), NBD Pseudo-household points (Feb 2022) and Roads (Feb 2022).

This allowed for the calculation of the number of locations without coverage, the % geographic coverage and % road coverage, across the province.

2.2. Signal Thresholds

Indoor and outdoor thresholds were used for RSRP (Reference Signal Received Power) which is a commonly used metric for measuring LTE signal strength. The thresholds are commonly used by cell operators as a basis for measurement and by a number of industry sources¹. The comments provided in Figure 2 are an indication of the type of service that users may experience from these different signal levels. However, numerous factors are at play that will influence this experience including the channel bandwidth implemented by the cell operator and the number of simultaneous users on the site.

Measure	Threshold	User Experience Comments
Outdoor	-114dBm	Voice and Basic Data outdoors
In Car / Rural	-110dBm	Voice and Basic Data in vehicle and rural indoor
Indoor Suburban	-102dBm	Improved in vehicle and indoor rural data. Basic indoor suburban service
Indoor Urban	-95dBm	Enhanced indoor data experience
Indoor Dense Urban	-91dBm	Good service level in most environments

Figure 2: Signal Strength Thresholds

¹ Eg https://www.ofcom.org.uk/__data/assets/pdf_file/0012/122250/about-mobile-luaa-data.pdf

This means that any signal less than -114dBm is treated as no coverage. The maps shown in this report use these thresholds as indicated in the accompanying legends. The thresholds shown above these levels will be unlikely to provide significantly better throughput, but these stronger signal levels will improve the stability and quality of the connection.

2.3. Initial Results

The results are broken down into:

- overall geographic coverage;
- address coverage;
- primary road coverage.

2.3.1. Geographic Coverage

Figure 3 presents the indoor and outdoor area coverage of the whole province for each operator (anonymised).



Figure 3: Geographic Coverage by Operator

Geographic coverage will of course include areas with no population and with no road network and so areas of no coverage would be expected. The metrics of address coverage and road coverage are of more interest to support economic and social activity.

2.3.2. Address Coverage

Figure 4 presents the indoor and outdoor coverage of the total number of civic addresses in the province for each operator (anonymised). This shows, for example, that Operator X covers 94% of addresses compared to Operator Z who cover 84% of the addresses.

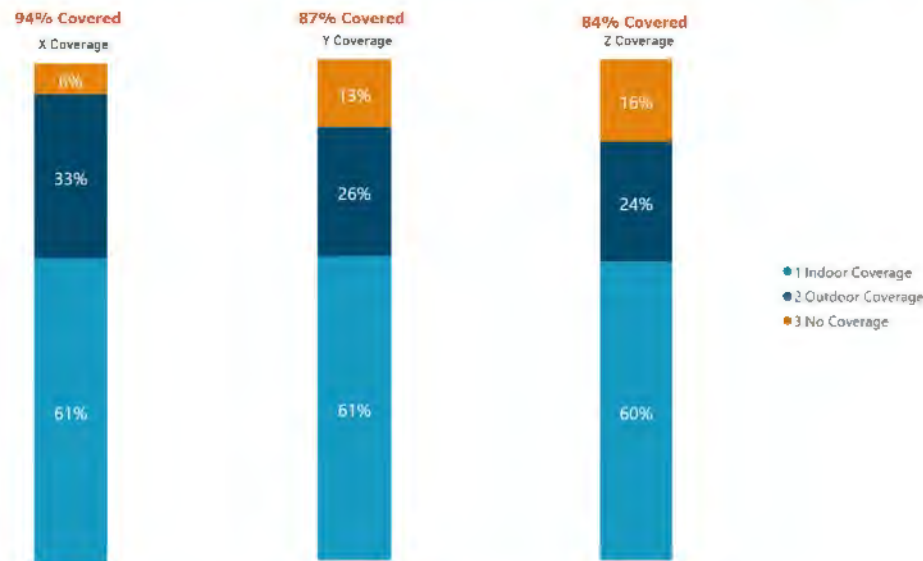


Figure 4: Civic address coverage by operator

This is also represented in the mapping portal by the number of civic addresses that can receive service from at least one operator as shown in Figure 5.

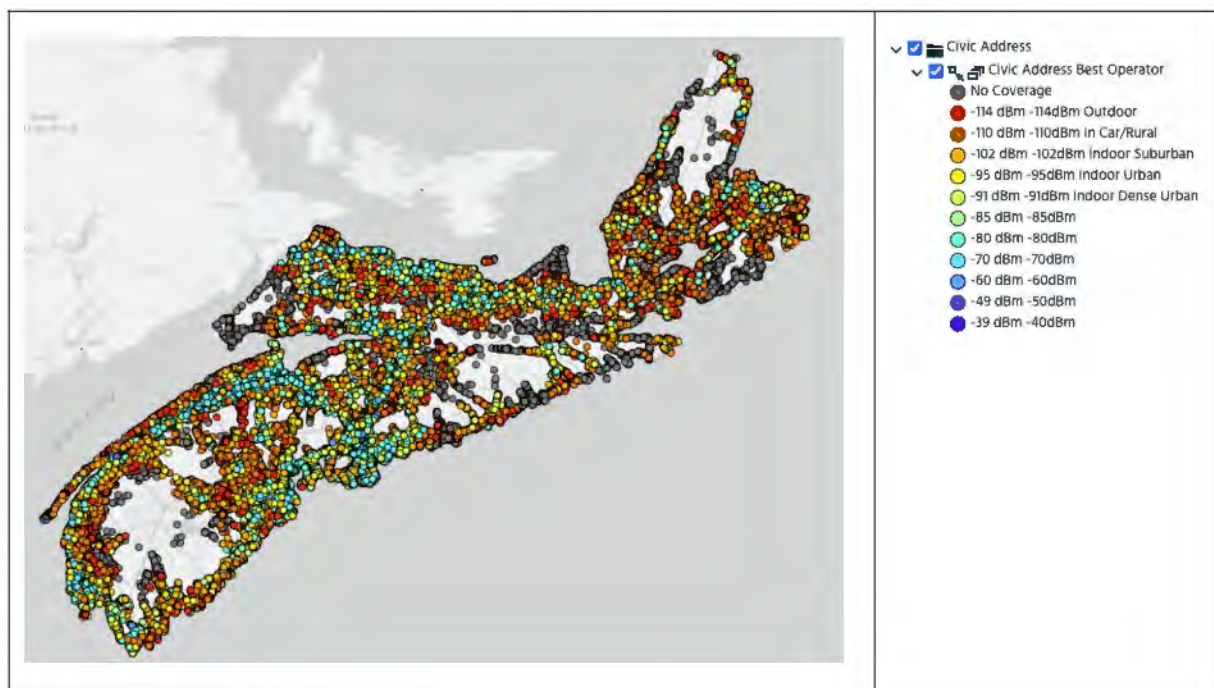


Figure 5: Address Coverage

Figure 5 shows significant areas with no coverage as shown in grey, particularly in the west of Cumberland County, across Guysborough County, Antigonish, Richmond and through Inverness County. The signal level thresholds shown in the legend range from basic (voice and low level data access) outdoors shown in red, through orange (the same service level inside a vehicle) and three further thresholds for indoor coverage in various urban densities.

Figure 6 presents the % indoor and outdoor coverage from any operator of the total number of civic addresses, broken down by county.

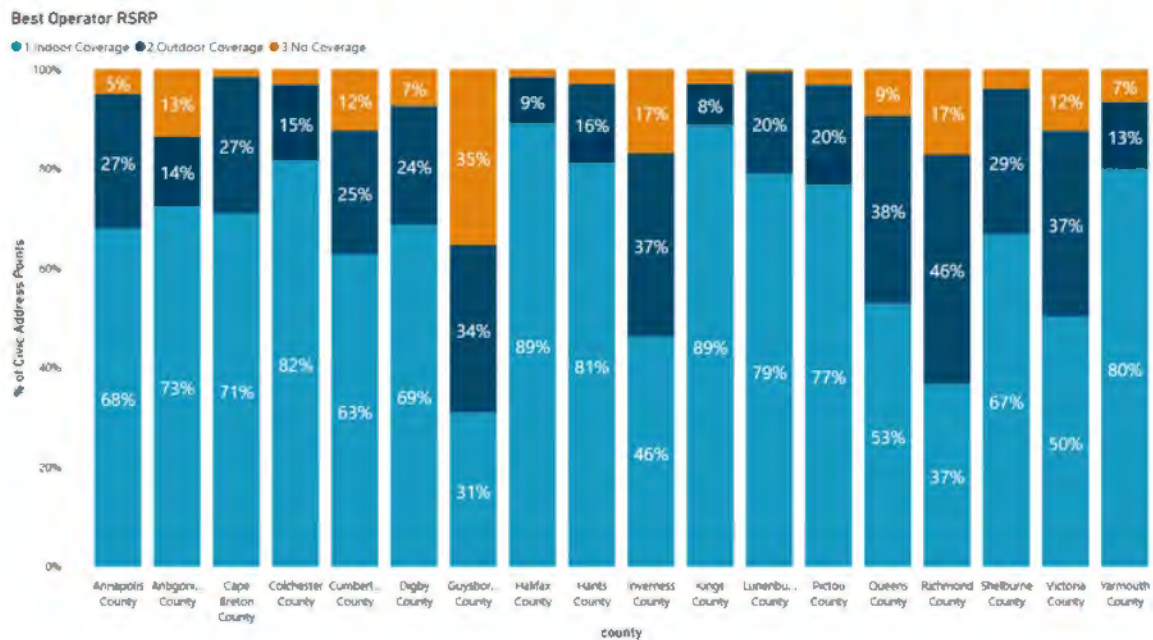


Figure 6: Civic address % coverage by any operator

For example, this shows that Guysborough County has 35% of the addresses not covered by any operator whereas Cape Breton County has only 2% of the addresses not covered by an operator.

In terms of absolute numbers, Figure 7 shows the breakdown per county of coverage, including addresses not covered by any operator:

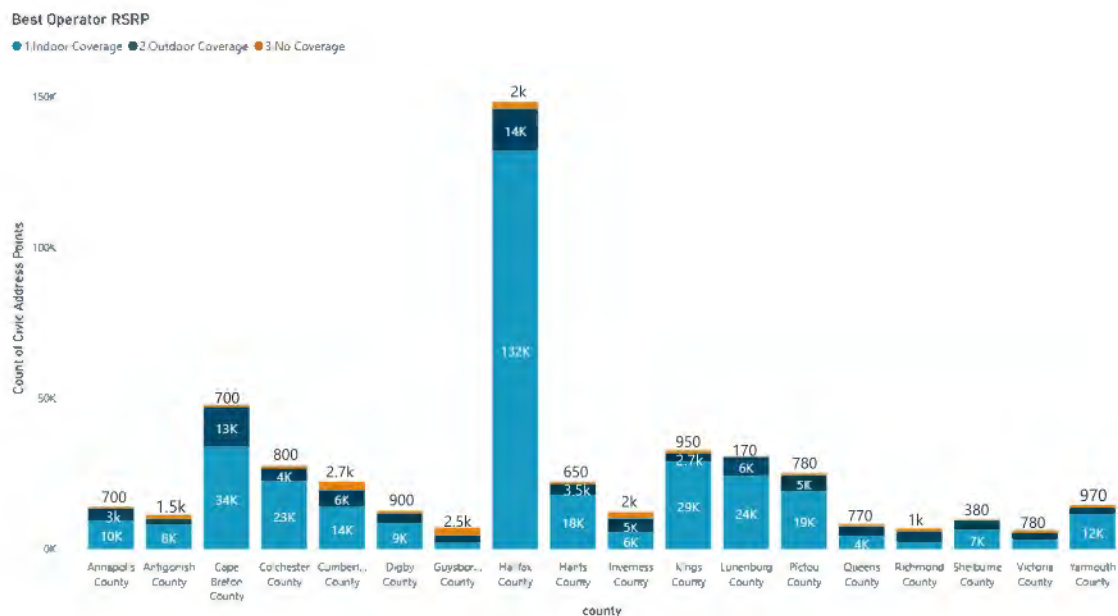


Figure 7: Civic Address Coverage by any Operator

This shows that Cumberland County, Guysborough County, Halifax County and Inverness County all have over 2,000 uncovered civic addresses each and represent the largest geographic uncovered areas.

2.3.3. Road Coverage

Figure 8 presents the indoor and outdoor coverage along the primary roads of the province for each operator. This shows, for example, that Operator X covers 84% of primary roads compared to Operator Z who cover 64%. In the case of roads, the indoor coverage can be considered equivalent to the coverage that can be obtained while inside a vehicle.

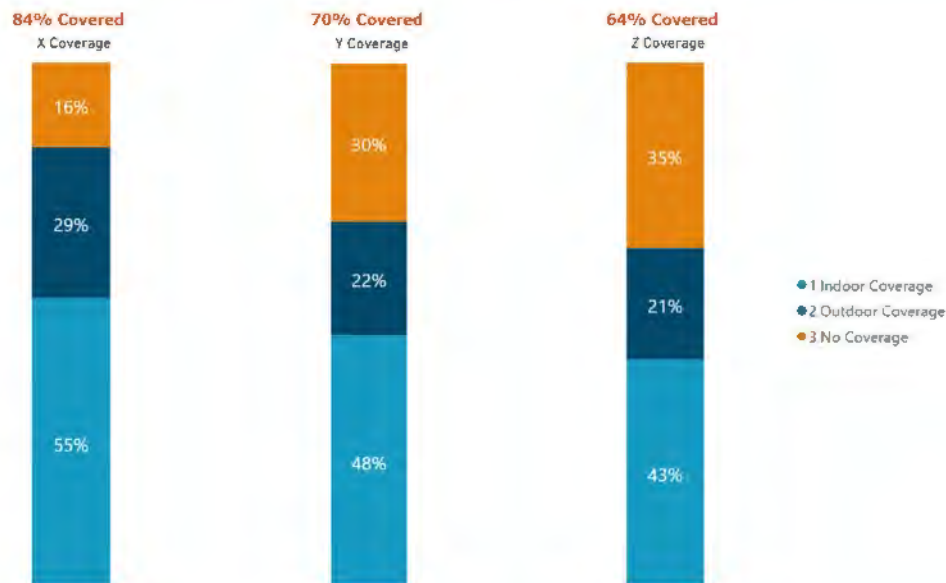


Figure 8: Primary Road coverage by operator

This is also represented in the mapping portal by the length of road where coverage is available from at least one operator as shown in Figure 9.

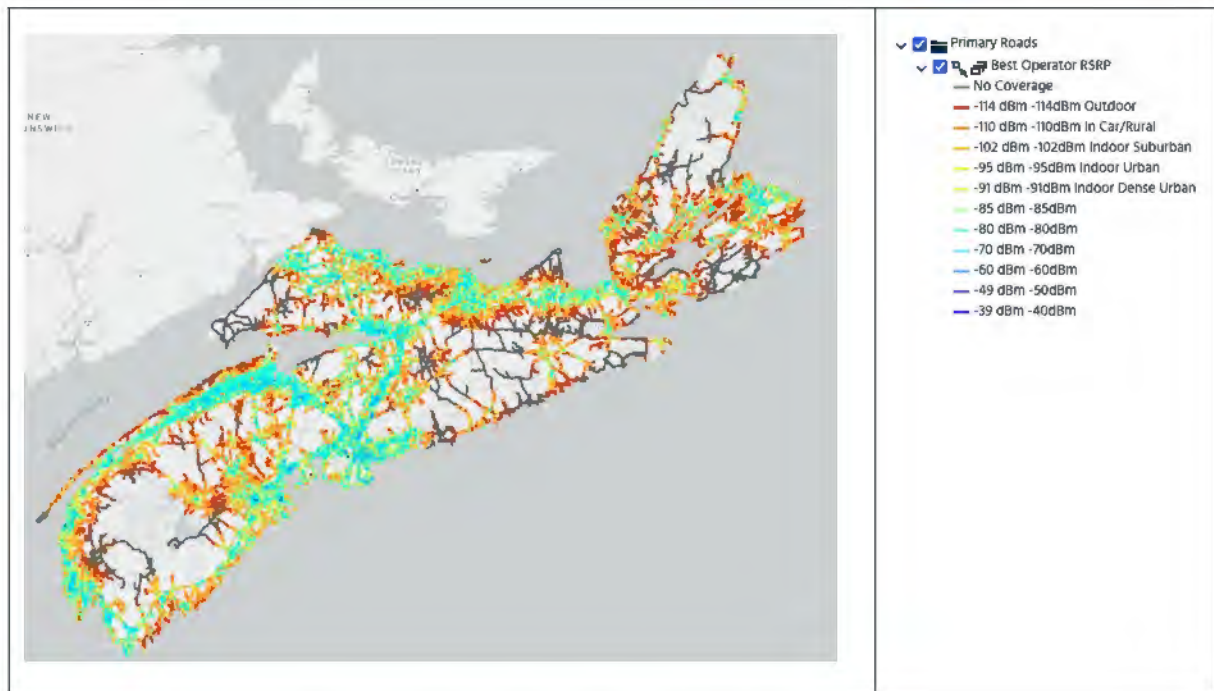


Figure 9: Primary Road Coverage by Best Operator

Figure 9 shows areas of no coverage on the 209 in Cumberland County, cross-province routes in the north east (374, 348), the 245 in Antigonish, the 316 in Guysborough County, Richmond and through Inverness County. Approximately 100km of the 298km Cabot Trail is also shown as uncovered by any operator.

Figure 10 presents the primary road % coverage from any operator, broken down by county.

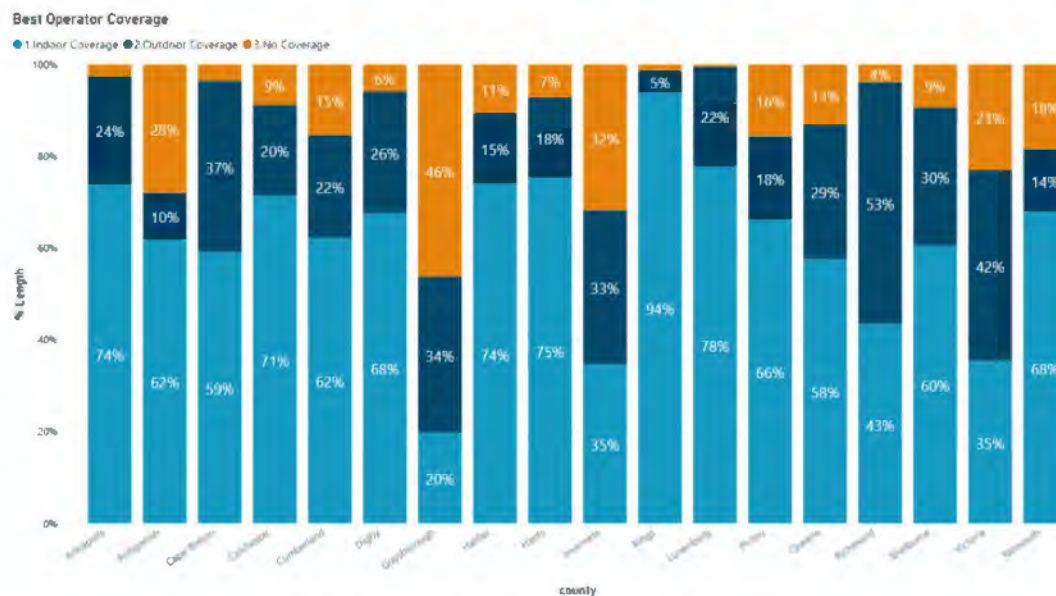


Figure 10: Primary Road % coverage by any operator

This shows, for example, that Guysborough County has 46% of its primary roads not covered by any operator whereas Cape Breton County has only 4% of its primary roads not covered by an operator.

In terms of absolute numbers, Figure 11 shows the breakdown per county of primary roads not covered by an operator in kms:

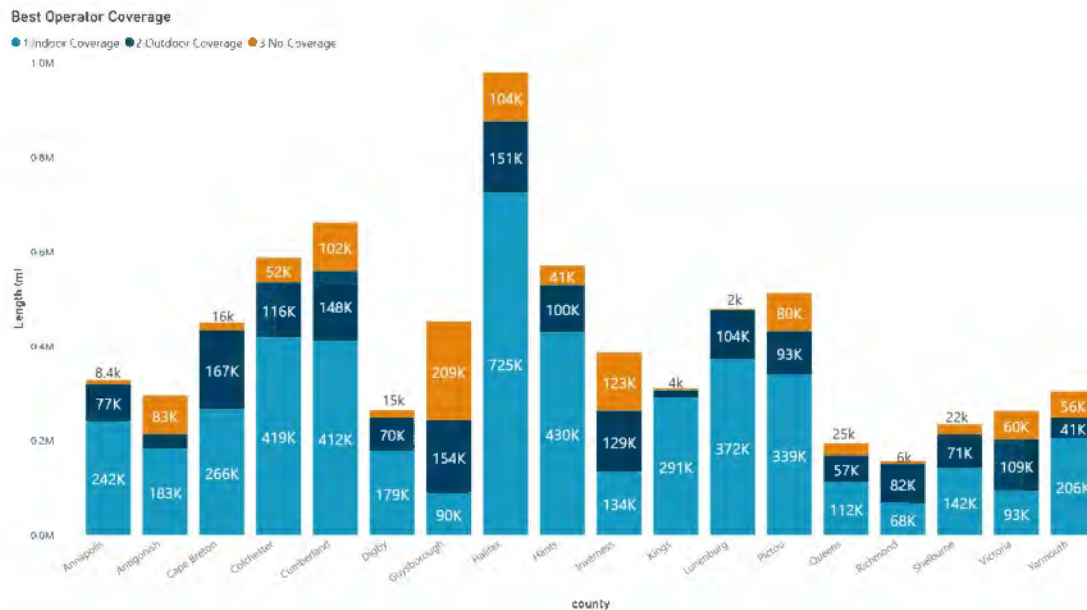


Figure 11: Primary Road coverage by any operator

This shows that Antigonish (83km), Cumberland (102km), Guysborough (209km), Halifax (104km), Inverness (123km) and Pictou (80km) are the counties with the most unserved primary roads.

2.4. Conclusions

The desktop coverage analysis carried out, based on the existing tower sites spread across the province, shows a range of civic addresses and road routes with no coverage from any operator. There are large clusters in certain areas and more dispersed pockets of no coverage throughout the province. As expected, the main population centres are better covered than the more rural areas.

The total number of civic addresses with no coverage amounts to 21,143 out of a total 461,000 addresses in the province (4.6%). If we assume that a cell tower could provision a maximum of 1,000 subscribers, then in theory, approximately 21 new tower sites could cover all the unserved addresses. However, that assumes that all 21,000 addresses would be within coverage of these 21 sites, which will not be the case in practice as these addresses are dispersed across the province.

Section 4 outlines the approach used by the planning software to determine how best to serve the maximum number of unserved addresses with the least number of new towers.

Prior to this, Section 3 describes the drive surveys which were undertaken to augment the coverage planning.

3. Drive Surveys

3.1. Approach

To complement the desktop prediction analysis, drive surveys were carried out by DNS staff using FarrPoint's cellular coverage equipment installed on vehicles driven on chosen routes. This equipment automatically measures the strength of all cellular operators as the vehicle is driven and transfers the data to the FarrPoint mapping portal. The routes driven were as follows:

- Route 1 – Cabot Trail;
- Route 2 – Cape Breton;
- Route 3 – Cumberland;
- Route 4 – Annapolis – West Hants;
- Route 5 – Digby Neck;
- Route 6 – Pictou – Antigonish;
- Route 7 – South West;
- Route 8 – Truro – Guysborough.

3.1.1. Cabot Trail

This route follows the coast around Cape Breton peninsula. It encompasses a number of areas of predicted poor coverage from any operator including significant stretches of primary road north of Petit Étang at the west side and north of Goose Cove on the east side



Figure 12: Cabot Trail Drive Route

3.1.2. Cape Breton

The route follows the west coast of the Bras d'Or lake, then travels inland to the south towards Grande Anse. From there, the route goes east to St Peter's and on to Framboise. A section of road is driven between Framboise and Stirling. The route then goes on to skirt both sides of the Grand Mira lake and back along the south-east Atlantic coast to Framboise. This route encompasses many areas of poor and no coverage from any operator.

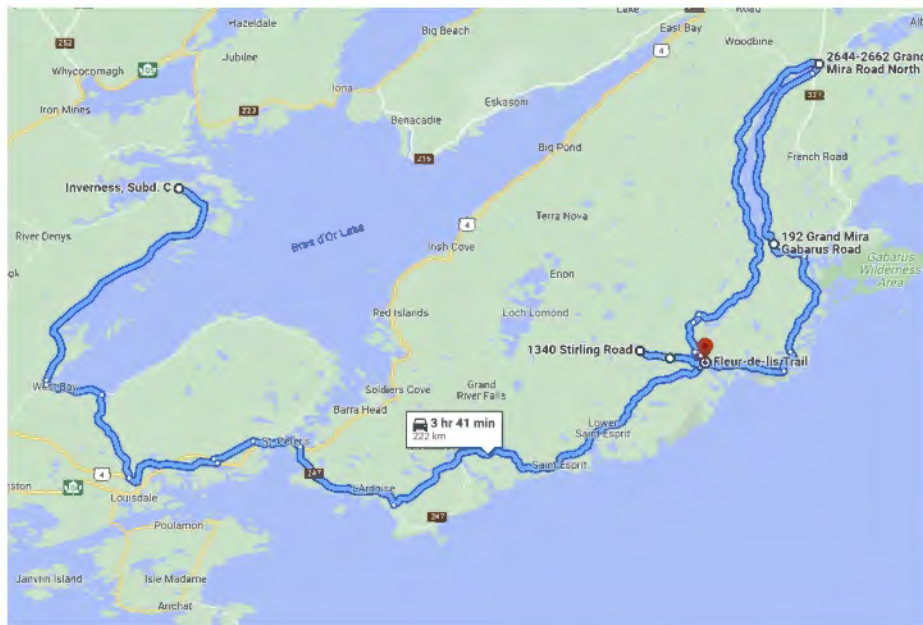


Figure 13: Cape Breton Drive Route

3.1.3. Cumberland

Two drive routes were chosen in Cumberland. These include a loop around the area of Red River and a leg east towards Parrsboro, then north to Southampton and on to Amherst. The second route is centred around Earlstown. Large parts of these routes were predicted to have little or no coverage.

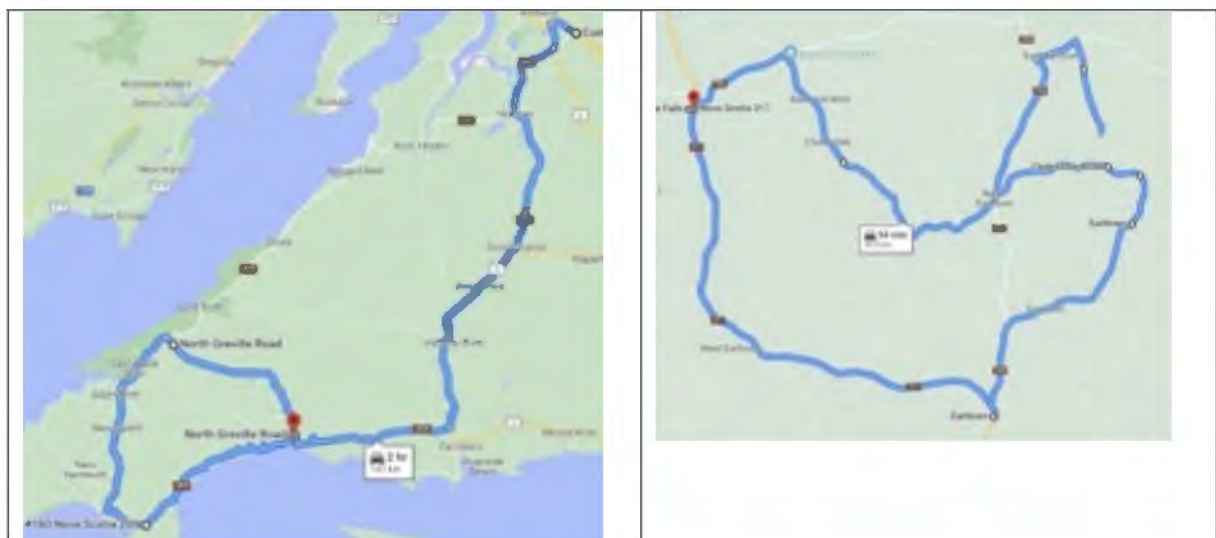


Figure 14: Cumberland Drive Routes

3.1.4. Annapolis – West Hants

This route follows the coast from Cheverie in the west to Tennycape in the east and also a southerly route from Walton to Cogmagun River. The majority of this route was predicted to have no coverage.

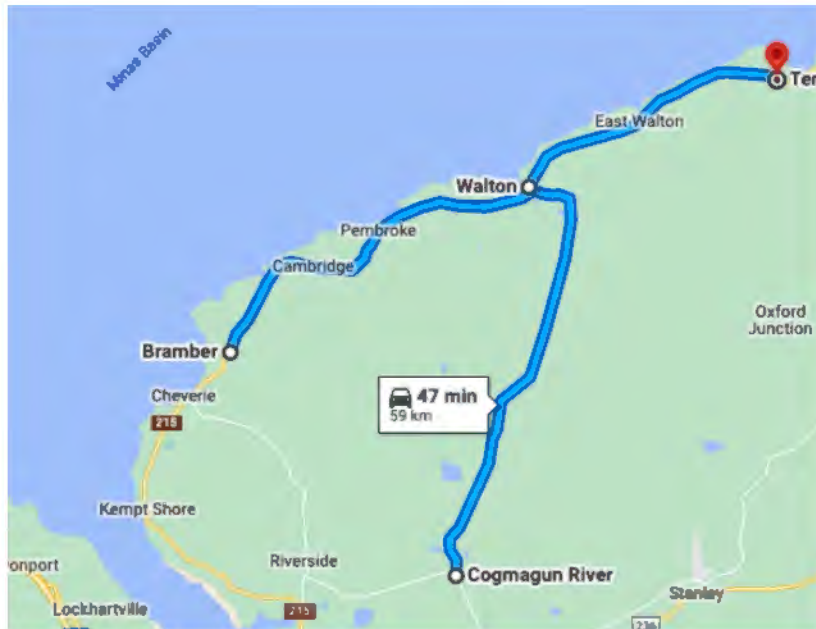


Figure 15: Annapolis – West Hants Drive Route

3.1.5. Digby Neck

This route follows the Digby Neck peninsula. Coverage was predicted to be poor with no coverage at the southern-most tip.



Figure 16: Digby Neck Drive Route

3.1.6. Pictou – Antigonish

The route follows the coast road from Arisaig in the west to Antigonish at the north-east tip, then takes a loop south to West Lakevale and on to Maryvale and finally north to Malignant Cove. Most of this route was predicted to have no coverage.



Figure 17: Pictou - Antigonish Drive Route

3.1.7. South West

The drive route goes east from Carleton towards Shelbourne, then along the 103 to Liverpool where there is a loop to the north-west via Lake Rossignol and Pleasantfield then back to Liverpool. The road east from Carleton and the loop north-west of Liverpool were predicted to have poor or no coverage.

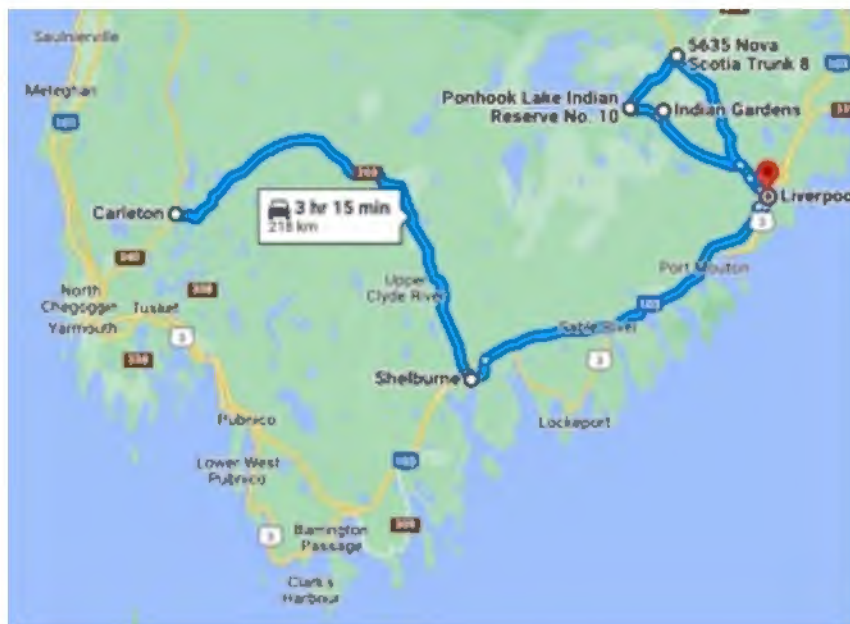


Figure 18: South West Drive Route

3.1.8. Truro – Guysborough

The route goes east along the coast from Musquodoboit Harbour towards Sheet Harbour, then continues east along the coast to Larry's River where the route goes north towards Guysborough. From Guysborough, the route goes west inland towards South Lochaber then on towards Lorne, where it then turns south back to Sheet Harbour. A significant portion of this route was predicted to have poor or no coverage.



Figure 19: Truro - Guysborough Drive Route

3.2. Updated Results

The results in this section show the predicted "best operator" signal level alongside the drive survey maps for each route. The predicted maps show areas where there was no usable signal predicted by any operator in grey. The drive survey maps show the areas with zero operators in red. The grey areas on the predicted maps can be taken as approximately equivalent to the red areas on the drive survey maps.

3.2.1. Cabot Trail

Figure 20 shows the predicted coverage along the Cabot Trail route, with the areas of no coverage from any operator coloured in grey. Figure 21 shows the result of the drive surveys on the route. The results show that the areas of poor and no coverage largely follow the predicted coverage plot.



- ✓ ☒ Primary Roads
- ✓ ☒ Best Operator RSRP
 - No Coverage
 - -114 dBm -114dBm Outdoor
 - -110 dBm -110dBm In Car/Rural
 - -102 dBm -102dBm Indoor Suburban
 - -95 dBm -95dBm Indoor Urban
 - -91 dBm -91dBm Indoor Dense Urban
 - -85 dBm -85dBm
 - -80 dBm -80dBm
 - -70 dBm -70dBm
 - -60 dBm -60dBm
 - -49 dBm -50dBm
 - -39 dBm -40dBm

Figure 20: Predicted Coverage around Cabot Trail Drive Route



- ✓ ☒ Outdoor Coverage (>05dBm)
- ✓ ☒ DNS2_mobile_120k_opscount_105
 - 3 Ops
 - 2 Ops
 - 1 Op
 - Zero Ops

Figure 21: Drive Survey Results around Cabot Trail Drive Route

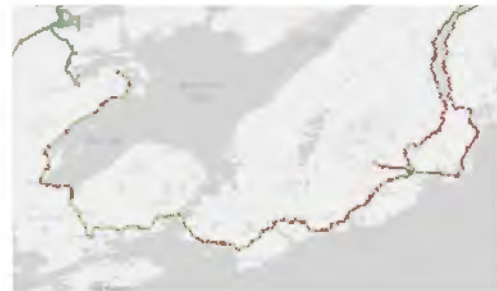
3.2.2. Cape Breton

Figure 22 shows the predicted coverage along the Cape Breton route, with the areas of no coverage from any operator coloured in grey. Figure 23 shows the result of the drive surveys on the route. The results show that the areas of poor and no coverage largely follow the predicted coverage plot. However, coverage does exist around the Framboise area from all three operators in an area that was predicted to have no coverage. It is likely this is due to a newly commissioned cell tower in this area that did not exist in the government database at the time of downloading.



- ✓ ☒ Primary Roads
- ✓ ☒ Best Operator RSRP
 - No Coverage
 - -114 dBm -114dBm Outdoor
 - -110 dBm -110dBm In Car/Rural
 - -102 dBm -102dBm Indoor Suburban
 - -95 dBm -95dBm Indoor Urban
 - -91 dBm -91dBm Indoor Dense Urban
 - -85 dBm -85dBm
 - -80 dBm -80dBm
 - -70 dBm -70dBm
 - -60 dBm -60dBm
 - -49 dBm -50dBm
 - -39 dBm -40dBm

Figure 22: Predicted Coverage around Cape Breton

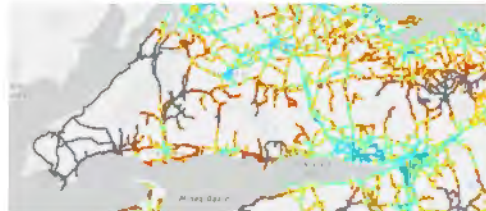


- ✓ ☒ Outdoor Coverage (-105dBm)
- ✓ ☒ DNS2_mobile_t20k_opscount_105
 - 3 Ops
 - 2 Ops
 - 1 Op
 - Zero Ops

Figure 23: Drive Survey Results around Cape Breton

3.2.3. Cumberland

Figure 24 shows the predicted coverage along the Cumberland route, with the areas of no coverage from any operator coloured in grey. Figure 25 shows the result of the drive surveys on the route. The results show that the areas of poor and no coverage largely follow the predicted coverage plot.



- ✓ ☒ Primary Roads
- ✓ ☒ Best Operator RSRP
 - No Coverage
 - -114 dBm -114dBm Outdoor
 - -110 dBm -110dBm In Car/Rural
 - -102 dBm -102dBm Indoor Suburban
 - -95 dBm -95dBm Indoor Urban
 - -91 dBm -91dBm Indoor Dense Urban
 - -85 dBm -85dBm
 - -80 dBm -80dBm
 - -70 dBm -70dBm
 - -60 dBm -60dBm
 - -49 dBm -50dBm
 - -39 dBm -40dBm

Figure 24: Predicted Coverage around Cumberland



Figure 25: Drive Survey Results around Cumberland

3.2.4. Annapolis – West Hants

Figure 26 shows the predicted coverage along the Annapolis-West Hants route, with the areas of no coverage from any operator coloured in grey. Figure 27 shows the result of the drive surveys on the route. Coverage on the eastern section of the route is better than predicted. This is likely due to one or more newly commissioned cell towers in this area that did not exist in the government database at the time of downloading.



- ✓ ☒ Primary Roads
- ✓ ☒ Best Operator RSRP
 - No Coverage
 - -114 dBm -114dBm Outdoor
 - -110 dBm -110dBm In Car/Rural
 - -102 dBm -102dBm Indoor Suburban
 - -95 dBm -95dBm Indoor Urban
 - -91 dBm -91dBm Indoor Dense Urban
 - -85 dBm -85dBm
 - -80 dBm -80dBm
 - -70 dBm -70dBm
 - -60 dBm -60dBm
 - -49 dBm -50dBm
 - -39 dBm -40dBm

Figure 26: Predicted Coverage around Annapolis – West Hants



- ✓ ☒ Outdoor Coverage (-105dBm)
- ✓ ☒ DNS2_mobile_120k_opscount_105
 - 3 Ops
 - 2 Ops
 - 1 Op
 - Zero Ops

Figure 27: Drive Survey Results around Annapolis – West Hants

3.2.5. Digby Neck

Figure 28 shows the predicted coverage along the Digby Neck route, with the areas of no coverage from any operator coloured in grey. Figure 29 shows the result of the drive surveys on the route. The results show that the areas of poor and no coverage largely follow the predicted coverage plot. However, some coverage exists at the southern-most tip of the peninsula that wasn't predicted. This is likely due to a newly commissioned site that did not exist in the government database at the time of downloading.

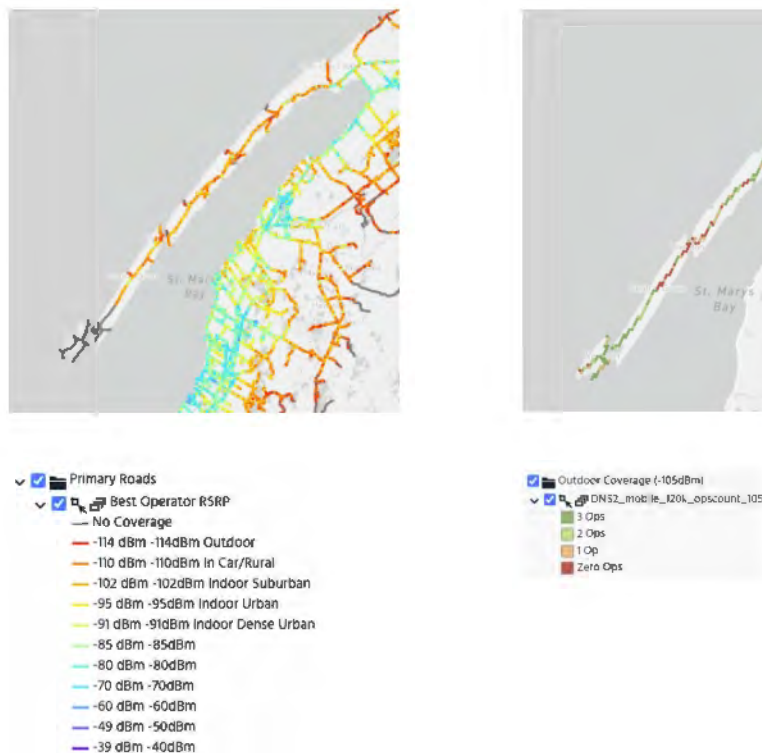
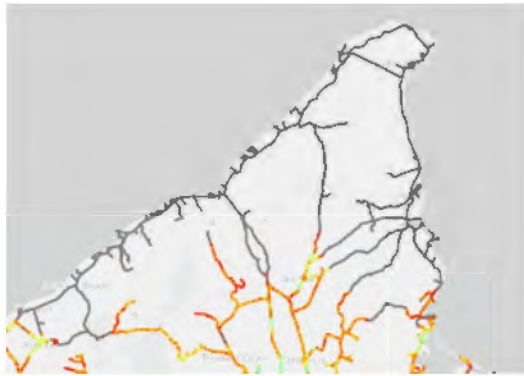


Figure 28: Predicted Coverage around Digby Neck

Figure 29: Drive Survey Results around Digby Neck

3.2.6. Pictou – Antigonish

Figure 30 shows the predicted coverage along the Pictou - Antigonish route, with the areas of no coverage from any operator coloured in grey. Figure 31 shows the result of the drive surveys on the route. The majority of this route was predicted to have no coverage. The actual coverage measured is in some areas an improvement on that predicted. This is likely due to newly commissioned towers that were not in the government database at the time of downloading.



- ✓ ☒ Primary Roads
- ✓ ☒ Best Operator RSRP
 - No Coverage
 - -114 dBm -114dBm Outdoor
 - -110 dBm -110dBm in Car/Rural
 - -102 dBm -102dBm Indoor Suburban
 - -95 dBm -95dBm Indoor Urban
 - -91 dBm -91dBm Indoor Dense Urban
 - -85 dBm -85dBm
 - -80 dBm -80dBm
 - -70 dBm -70dBm
 - -60 dBm -60dBm
 - -49 dBm -50dBm
 - -39 dBm -40dBm

Figure 30: Predicted Coverage around Pictou - Antigonish



- ✓ ☒ Outdoor Coverage (-105dBm)
- ✓ ☒ DNS2_mobile_120k_opscount_105
 - 3 Ops
 - 2 Ops
 - 1 Op
 - Zero Ops

Figure 31: Drive Survey Results around Pictou - Antigonish

3.2.7. South West

Figure 32 shows the predicted coverage along the South West route, with the areas of no coverage from any operator coloured in grey. Figure 33 shows the result of the drive surveys on the route. The results show that the areas of poor and no coverage largely follow the predicted coverage plot.

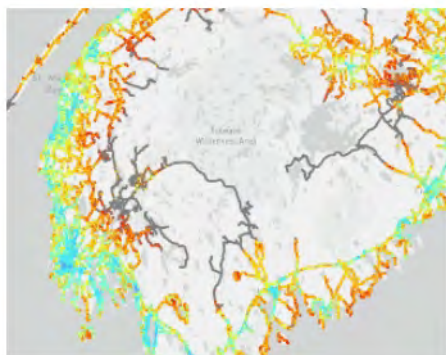




Figure 32: Predicted Coverage around South West

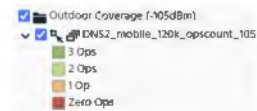


Figure 33: Drive Survey Results around South West

3.2.8. Truro – Guysborough

Figure 34 shows the predicted coverage along the Truro – Guysborough route, with the areas of no coverage from any operator coloured in grey. Figure 35 shows the result of the drive surveys on the route. The results show that the areas of poor and no coverage largely follow the predicted coverage plot.



Figure 34: Predicted Coverage around South West



Figure 35: Drive Survey Results around South West

3.3. Conclusions

The drive surveys confirm that the areas of predicted poor or no coverage are accurate with the following exceptions:

- Cape Breton – Coverage exists around the Framboise area that was not predicted;
- Annapolis – West Hants – Coverage exists on the eastern leg of the drive route that was not predicted;
- Digby Neck – Coverage exists at the southern tip of the peninsula that was not predicted;
- Pictou – Antigonish – Coverage exists on the western leg of drive route and at the eastern tip of the peninsula that was not predicted.

The remaining areas will be considered within the infill solutions in Section 4.

4. Infill Solutions

4.1. Introduction

The analysis has shown a number of areas of poor coverage across the province. This can take the form of 'total not-spots' where there is no coverage from any provider or 'partial not-spots' where there is coverage from at least one provider but not all three. To a customer of one of these absent providers, this location would also be seen as a not-spot.

In order to look at options to address these poor coverage areas, and specifically the total not-spots, potential new infill sites were investigated to determine what locations would provide the most benefit in terms of increased coverage.

4.2. Approach

New tower locations were determined using FarrPoint's HTZ Communications radio planning software which was programmed to determine the best location of towers to cover the most unserved addresses. Radio propagation models were developed to provide coverage analysis from these new locations. The tower parameters used were similar to neighbouring towers in terms of frequency and channel bandwidth with height and power being optimised for each location.

The planning software will continue to identify new tower sites until all unserved addresses are connected, even if that means the last few towers only have one or two subscribers, which is clearly uneconomic. A threshold is needed and in this case a threshold of 20 connected subscribers was used at which point the software would stop identifying further new tower sites.

4.3. Costs

Budgetary capital costs for new tower locations have been developed based on the following cost elements:

- Tower structure;
- Land cost;
- Tower build;
- Access cost and power provision;
- Backhaul provision;
- LTE equipment.

The capital costs provide an indication of the scale of investment that would be required at each new tower location. The allocation of costs between government subsidy and commercial operator is not made and would be subject to the design of any intervention that may be planned.

The cost breakdown is as follows:

Item	Unit cost	Comment
14(1); 17(1)		

This gives a budgetary cost of 14(1); 17(1) per tower. The most significant factor is the access cost and power provision, and this has been investigated further for each new tower location identified.

4.4. Results

4.4.1. Initial Results

The initial results of the planning exercise show that 75 new tower locations would cover an additional 15,516 civic addresses of the 21,143 which are unserved.

However, the planning software places sites with no regard to how practical these locations may be in terms of access to nearby services or suitability of location e.g. within a national park etc. In order to check and refine these locations, a manual review was conducted of each location and adjustments made as necessary.

4.4.2. Final Results

The final results of the planning exercise show the following potential new tower locations, ordered by the number of unserved addresses which are now covered:

Ref	Station #	Site Location	Longitude 4DMS	Latitude 4DMS	No. connected sub	Ref	Station #	Site Location	Longitude 4DMS	Latitude 4DMS	No. connected sub
1	14	Cape D'Or Road	64°45'22.3"W	45°18'55.4"N	761	39	35	Hampton, Annapolis County	65°21'06.0"W	44°54'17.3"N	160
2	19	E side lake Charlotte	62°57'53.7"W	44°47'24.8"N	658	40	64	NE Economy	63°52'11.2"W	45°23'19.8"N	159
3	18	NW Wellington, Lunenburg Cty	64°51'01.6"W	44°19'47.2"N	646	41	24	S Garden of Eden	62°17'43.4"W	45°24'31.2"N	152
4	9	E Margaree Centre, CB	60°56'51.3"W	46°21'13.1"N	604	42	54	Grand River, Richmond Cty	60°39'27.1"W	45°38'55.3"N	146
5	21	E Carlton, Yarmouth cty	65°54'15.7"W	44°00'22.4"N	499	43	69	Margaretsville, Kings County	65°03'53.9"W	45°02'55.0"N	144
6	27	Tidnish	64°01'17.0"W	45°58'56.2"N	466	44	41	Drum Head, Goldboro	61°36'10.6"W	45°08'59.6"N	143
7	15	Freeport, Digby Neck	66°19'33.8"W	44°15'57.8"N	457	45	46	W Pleasant Bay	60°48'28.6"W	46°49'37.6"N	143
8	10	Ballantynes Cove, Cape George	61°54'35.2"W	45°51'49.5"N	429	46	3	NE of Diligent River	64°25'42.2"W	45°27'00.4"N	142
9	7	NE River Hebert	64°21'27.1"W	45°42'20.0"N	425	47	29	W Lake Paul, Kings County	64°40'42.4"W	44°51'56.4"N	142
10	11	N Lochaber, E side of lake	62°01'01.3"W	45°26'03.4"N	359	48	32	Lake George, Kings County	64°41'19.0"W	44°55'41.0"N	141
11	45	S West Quoddy	62°20'60.0"W	44°53'32.1"N	333	49	53	North River Bridge, CB	60°37'27.3"W	46°18'37.7"N	141
12	26	E Ecum Secum Harbour	62°08'56.7"W	44°57'53.7"N	311	50	43	S East Lake Ainslie	61°08'34.9"W	46°05'35.7"N	123
13	16	W Upper Stewiacke	63°02'33.7"W	45°12'09.6"N	306	51	60	S Burtons,	63°34'09.2"W	45°13'18.0"N	123
14	39	E Larry's River, Guysborough	61°22'27.5"W	45°13'36.1"N	291	52	62	Erinville, Guysborough Cty	61°44'00.3"W	45°22'10.9"N	119
15	12	St. Francis Harbour, Guysborough	61°18'23.2"W	45°26'32.4"N	282	53	67	N Waddens Cove	59°51'39.6"W	46°05'35.9"N	119
16	68	Lower Cove	64°26'05.2"W	45°43'38.4"N	259	54	61	Eliscomb mills	62°02'58.5"W	45°00'17.7"N	118
17	37	Little Harbour, Halifax County	62°50'33.4"W	44°42'59.5"N	255	55	74	NW Richfield, Yarmouth Cty	65°58'34.7"W	44°07'47.6"N	117
18	42	Malignant Cove	62°04'31.2"W	45°47'34.2"N	250	56	47	East River Saint Marys	62°08'39.7"W	45°23'02.4"N	114
19	33	SE East Jeddore	63°00'31.5"W	44°43'15.2"N	241	57	31	Guysborough Intervale	61°34'14.4"W	45°27'09.7"N	112
20	34	Moser River	62°15'02.2"W	44°58'43.6"N	232	58	51	N Forchu, CB	60°15'37.0"W	45°43'13.8"N	111
21	6	Lorneville	63°56'37.0"W	45°59'19.1"N	231	59	52	Bear River, Annapolis Cty	65°38'03.5"W	44°34'29.0"N	111
22	23	NE Arisaig	62°08'33.3"W	45°46'10.5"N	225	60	63	E Centre Musquodoboit	62°59'54.5"W	45°06'54.8"N	109
23	8	SE River Denys	61°06'07.4"W	45°47'37.7"N	219	61	44	Petit de Gras	60°56'09.1"W	45°30'01.7"N	106
24	2	Westbrook, North of Parrsboro	64°17'23.0"W	45°34'16.0"N	211	62	72	SE Lower Ship Harbour	62°48'38.5"W	44°46'22.9"N	100
25	36	SE Loch Lomond	60°33'57.6"W	45°45'59.4"N	210	63	50	W Earlton	63°08'15.7"W	45°34'45.6"N	98
26	30	NE Goshen	61°57'29.9"W	45°22'40.3"N	206	64	55	E South West Margaree	61°09'49.2"W	46°16'48.0"N	86
27	22	SW Sunnybrae, Mid NS	62°30'53.8"W	45°23'46.5"N	203	65	73	SE Bangs Falls	64°49'22.3"W	44°14'27.3"N	84
28	17	Morden, Kings County	64°56'46.2"W	45°06'08.6"N	198	66	59	Apple River, Cumberland County	64°47'08.9"W	45°27'41.3"N	79
29	20	Port Bickerton, Guysborough Cty	61°43'55.7"W	45°06'13.1"N	195	67	49	NE Lismore	62°14'50.1"W	45°42'52.3"N	75
30	75	West Bay East side, N point	60°57'32.4"W	45°45'55.4"N	189	68	48	Point Aconi	60°19'03.6"W	46°19'20.6"N	66
31	4	Cambridge, Noel Shore	64°06'20.3"W	45°12'05.9"N	186	69	1	West of Lower River Hebert	64°22'14.1"W	45°43'35.5"N	65
32	28	Walton, Noel Shore	64°00'23.2"W	45°13'23.8"N	186	70	57	W Bay St. Lawrence	60°29'18.3"W	46°59'54.2"N	62
33	65	Kempt Back Lake	65°50'03.1"W	44°02'52.1"N	185	71	70	NE Caledonia	62°23'43.8"W	45°16'49.1"N	54
34	13	Port Felix, Guysborough	61°13'08.0"W	45°15'00.0"N	184	72	66	Indian Harbour Lake	61°52'22.7"W	45°07'46.6"N	52
35	38	NW New Harbour West, Guysborough	61°30'26.4"W	45°12'14.7"N	175	73	5	Minasville, Noel Shore	63°49'24.8"W	45°16'42.8"N	48
36	56	E East Quinan	65°47'06.8"W	43°56'42.5"N	171	74	71	S New Salem, Cumberland Cty.	64°47'37.4"W	45°24'45.2"N	47
37	25	West side Grand Mira South	60°17'18.4"W	45°53'36.8"N	165	75	58	South Ingonish Harbour	60°25'55.4"W	46°37'37.5"N	38
38	40	Englishtown	60°32'33.6"W	46°16'59.2"N	164						

Plotting the profile of sites against the number of addresses covered shows the following profile:

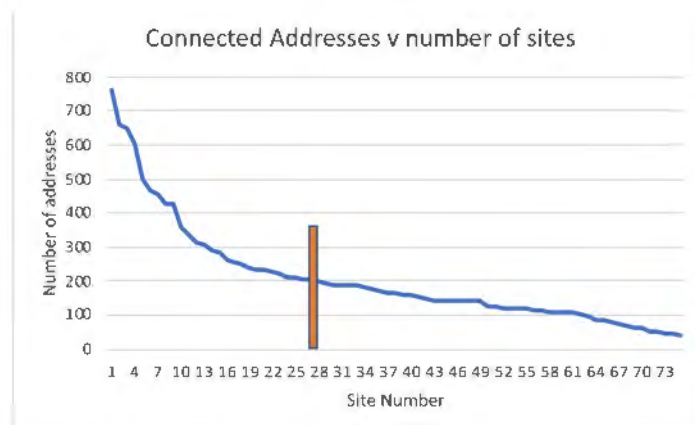


Figure 36: Number of Addresses Covered by Sites Profile

This shows that after around 27 new towers (shown in the figure by an orange bar), the number of additional addresses covered starts to flat line and so in terms of reducing benefit, this could present a cut-off point.

However, the drive surveys suggest that two of these sites may not be needed, site Ref 7 at Freeport and site Ref 8 at Ballantynes Cove. This then reduces the number of new towers to 25.

This would mean that the top 25 sites could become an initial focus as they provide the most benefit in terms of covering the maximum number of addresses per tower. These 25 new towers would cover an additional 9,569 premises of the 21,143 premises with no coverage.

4.4.3. Costs

The costs for these top 25 sites have been estimated by assessing their location in terms of access costs and power which were the two most significant variants as described previously.

This then gives an estimated cost for these 25 towers as follows, with the total for 73 sites (initial 75 minus the two sites not needed) for comparison:

Item	Top 25 sites	All 73 sites	Comment
14(1); 17(1)			

4.5. Coverage Improvements

The improvement in coverage from these new tower sites is shown below.

4.5.1. Address Coverage

Figure 37 shows the initial predicted address coverage with Figure 38 showing the additional locations covered with the inclusion of the 25 new sites. For comparison, Figure 39 shows the improved address coverage from all 73 sites.



Figure 37: Initial Address Coverage



Figure 38: Improved Address Coverage - 25 sites



Figure 39: Improved Address Coverage - 73 sites

Figure 40 shows the initial predicted address coverage within each county. Figure 41 shows the additional address locations covered with the inclusion of the 25 new sites. For example, Antigonish County benefits from an additional 1,466 address locations with indoor coverage and an additional 54 sites with outdoor coverage.

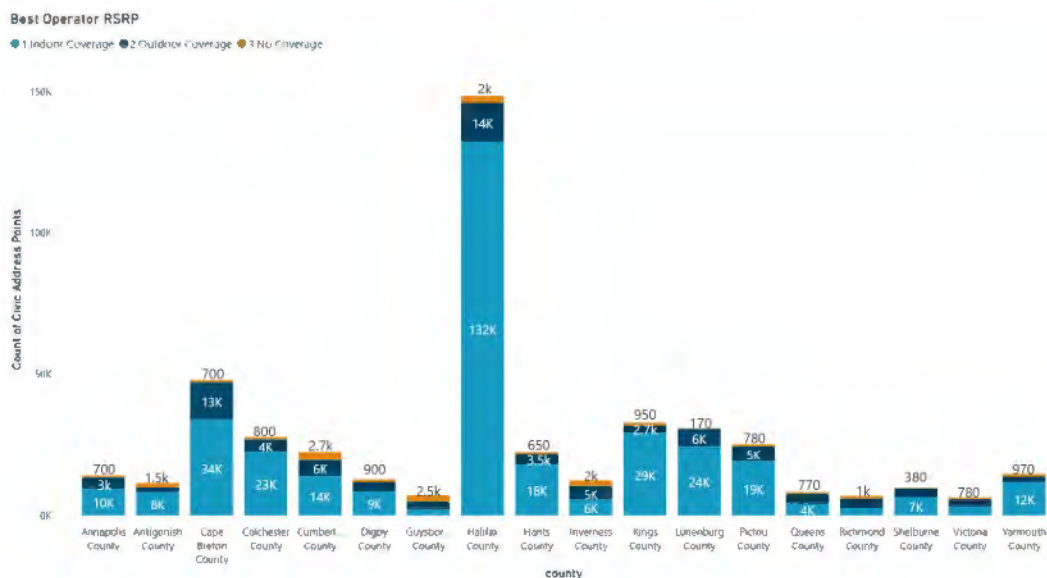


Figure 40: Initial Address Coverage by County

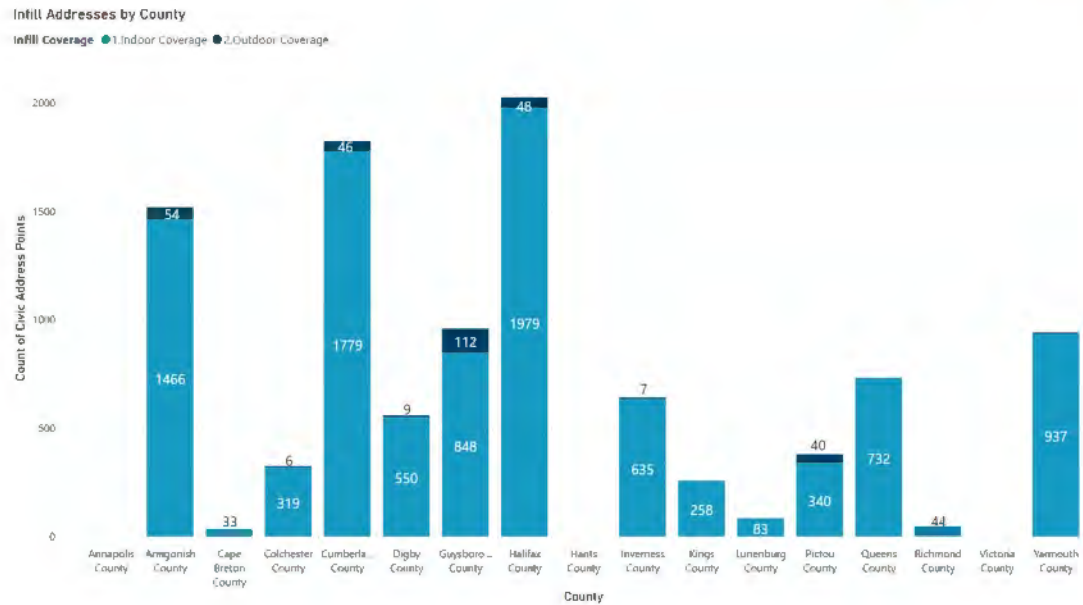


Figure 41: Improved Address Coverage by County

4.5.2. Road Coverage

Figure 42 shows the initial predicted roads coverage with Figure 43 showing the additional coverage with the inclusion of the 25 new sites and for comparison, Figure 44 shows the improved roads coverage from all 73 sites.

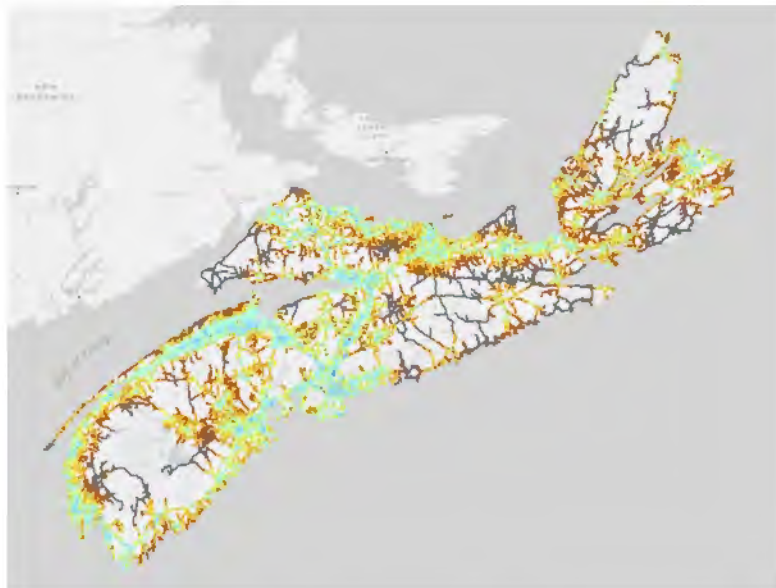


Figure 42: Initial Road Coverage

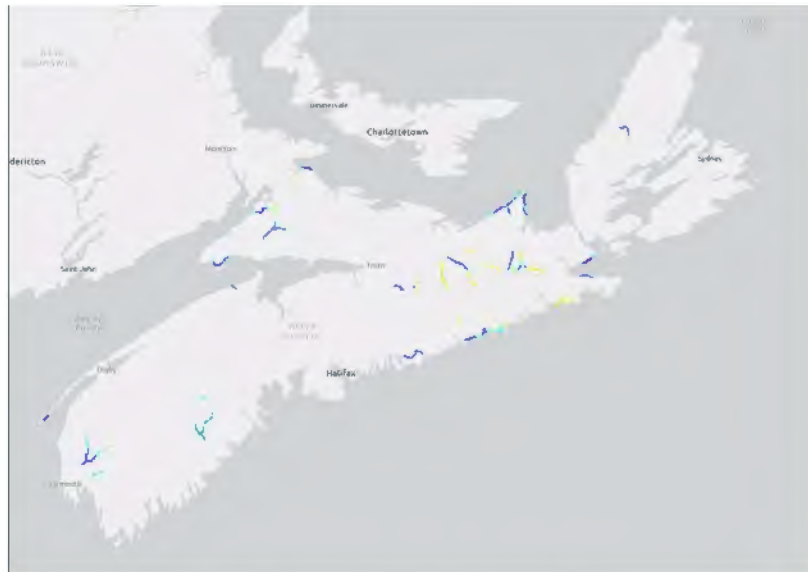


Figure 43: Improved Road Coverage - 25 sites

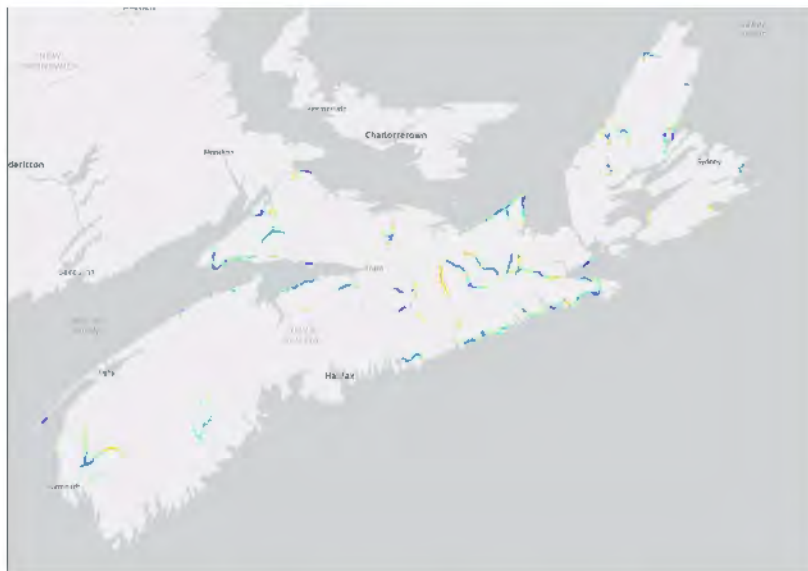


Figure 44: Improved Road Coverage - 73 sites

4.5.3. Road Coverage

Figure 45 shows the initial predicted road coverage within each county. Figure 46 shows the additional road sections covered with the inclusion of new sites. For example, Antigonish County benefits from an additional 78km of roads covered at indoor coverage levels and an additional 5km of roads at outdoor coverage level.

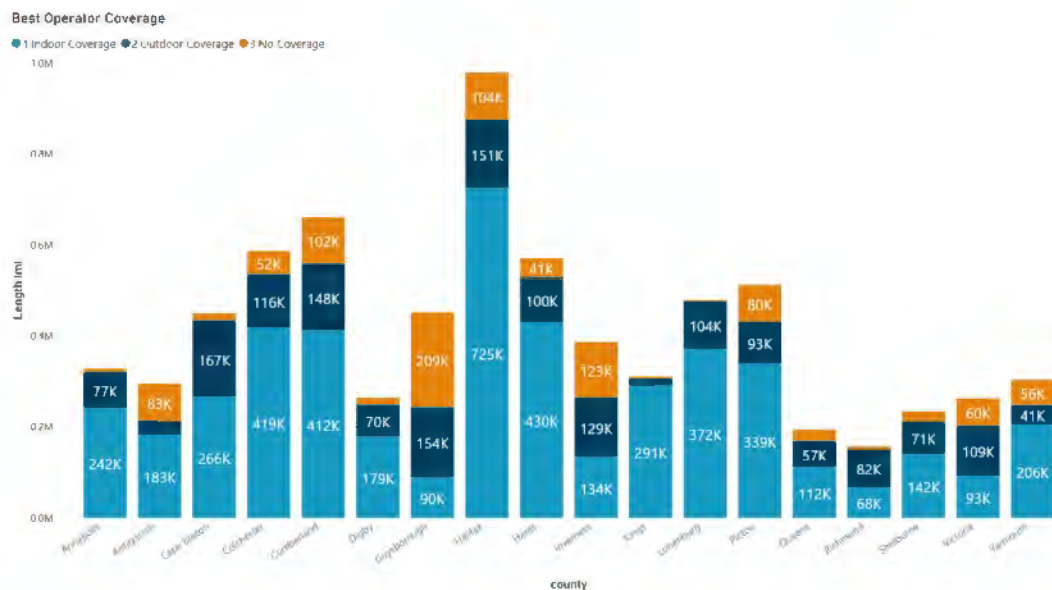


Figure 45: Initial Road Coverage by County

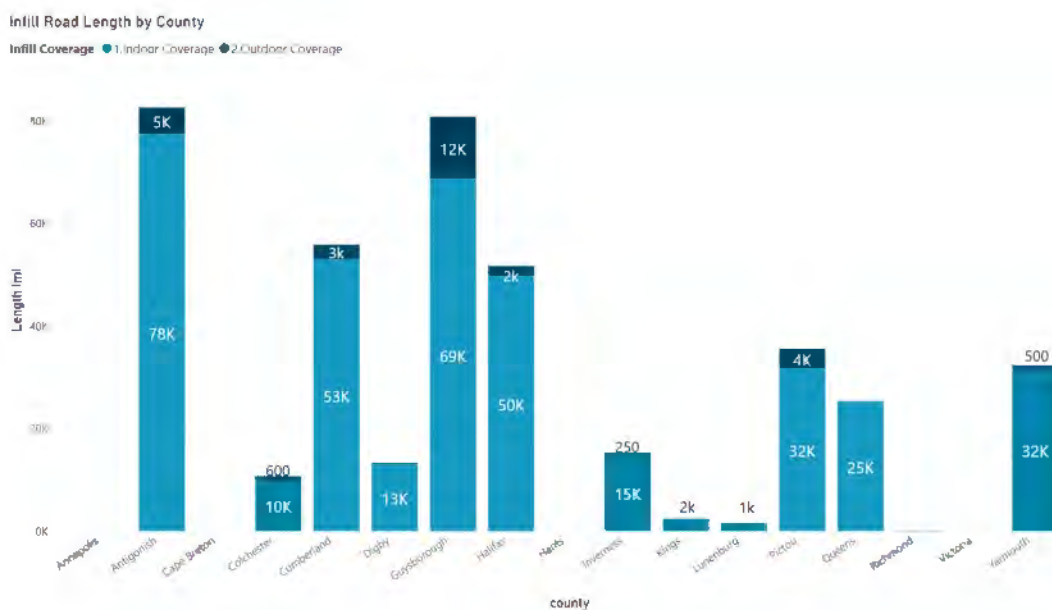


Figure 46: Improved Road Coverage by County

5. Conclusions

This study used a mix of desktop analysis and drive surveys to determine the existing cellular coverage position across the province. The results showed areas of partial and total not-spots which were spread across the province as measured by address coverage and primary and minor road coverage.

Potential new tower sites were determined which gave the best coverage of unserved addresses with the top 25 tower locations chosen as providing the best return. This is an arbitrary cut off used to limit the capital spend required and can be adjusted as necessary to build into a future business case for investment if that were required. Further modelling could be completed to focus in on certain areas of concern, for example sections of key road routes etc.

14(1); 17(1)

Costs for the development of these sites were built up using industry standard unit costs which when applied to the 25 sites gives a total cost of [REDACTED]. Costs figures have also been included for all 73 sites at [REDACTED].

With these 25 new sites, a total of 9,569 of the 21,143 uncovered civic addresses could be covered and 407km of the 1,010km unserved primary roads. With 73 sites, 15,516 of the 21,143 uncovered civic addresses are covered and 772km of the 1,010km unserved primary roads.

The 75 sites chosen as a focus for this report were identified through detailed analysis that attempted to minimise costs whilst retaining a practical solution. This involved positioning of sites such that power and backhaul costs were as low as possible, whilst at the same time providing the coverage required to the priority areas. These priority areas were primarily where there are clusters of residential premises with no current cell coverage provision.

Whilst it would be possible to calculate costs for complete geographic coverage, this would inevitably require placement of sites in more remote areas with no current infrastructure or services. This would require a different approach which was outside the scope of this initial report. However, based on an approximation of the land mass without any current cell coverage, full geographic coverage may require up to a further 200 towers over and above the 73 already assessed in this report. The tower cost estimates outlined in this report indicate that a further [REDACTED] could be required to fund these additional 200 towers. It should be noted however that no detailed work has been carried out to calculate this blanket coverage provision and these costs could be significantly higher due to the remote nature of the geography.

In conclusion, DNS are now in a position to better understand the existing cellular coverage across the province and the areas of poor coverage, and the scale of capital cost required to provide additional coverage.

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January 29, 2024

Doug Patterson
Chief Administrative Officer
Municipality of the District of St. Mary's Council
doug.patterson@saint-marys.ca

Dear Doug Patterson:

Thank you for your correspondence dated January 8 and 9, 2024, outlining concerns about the solid waste management facility guidelines for construction and demolition debris storage, transfer, process and disposal (Guidelines) and its affect on the Municipality of the District of St. Mary's. I appreciate you taking the time to share your concerns with me. I am responding on behalf of the Minister.

Impact of Guidelines

Nova Scotia Federation of Municipalities, the Association of Municipal Administrators and all municipalities were notified about the upcoming Guidelines on July 7, 2022. Before providing the above-mentioned notification, Nova Scotia Environment and Climate Change (ECC) requested and received feedback from municipalities during engagement sessions. Feedback included potential cost implications associated with regulatory changes and updating the Guidelines. ECC took this into consideration to develop approaches that reduce potential cost impacts where feasible.

The Guidelines provide guidance and outline the acceptable minimum requirements for siting, constructing, operating and rehabilitating a Solid Waste Management Facility for the storage, transfer, processing and disposal of C&D. The minimum requirements are applicable for all C&D facilities in Nova Scotia and unfortunately, there are no grandfathering opportunities for existing facilities.

C&D Stockpile

In regards to your questions about the C&D stockpile at your site, we encourage you to engage the services of a qualified third-party consultant to help you with solutions to properly address that material.

Funding

You also inquired about funding to assist municipalities implement necessary changes associated with the Guidelines. Potential funding may be available under the Provincial Capital Assistance Program (PCAP). Information regarding PCAP can be found at: <https://www.nsfm.ca/solid-waste.html>.

There may be a funding opportunity under Infrastructure Canada's Canada Community Building Fund (ICCCB) as well. Information regarding ICCCB can be found at: https://www.bing.com/search?q=Infrastructure+Canada%E2%80%99s+Canada+Community+Building+Fund&cvid=46afea1da40248c38eb8adc87f982bc0&gs_lcrp=EgZjaHJvbWUyBggAEEUYOTIHCAEQRRj8VdIBCDE3MzdqMGo5qAIAAsAIA&FORM=ANAB01&PC=U531&ntref=1.

It should be noted that ECC has Business Relationship Managers (BRM's) that may be able to assist you with the above-mentioned issues. They can provide information, help you navigate required processes, establish connections with staff and provide status updates. You can contact Paula Francis at paula.francis@novascotia.ca or Lynda Weatherby at lynda.weatherby@novascotia.ca for more information regarding our BRM's.

It is my understanding that you had a discussion with Paul Keats, ECC Director, and there was agreement that a future meeting at the St. Mary's C&D site would be beneficial. Members of my management team will be contacting you to schedule a meeting, continue discussing these issues and provide any further clarification that is required to help you move forward.

In the meantime, please feel free to contact Marc Theriault, District Manager for our Antigonish district office at (902) 863-7389 if you have any questions.

Sincerely,



Adrian Fuller
Executive Director
Inspection, Compliance and Enforcement Division

c: Hon. Timothy Halman, Minister of Environment and Climate Change
Marc Theriault

Rural Communities Foundation of Nova Scotia



Hugh MacKay
Fund Development
January 2024

Agenda

- Who we are
- What we do
- Dave Gunning Zero Hunger Fund
- Ask for Consideration
- Q&A





Who we are

- A community foundation supporting rural Nova Scotia, through convening, fund development and granting.
- We have a proven track record, with more than 20 years of developing and delivering grant programs.
- We are a registered charity, accountable to community members, donors & grantees.
- We are a member of the Community Foundations of Canada and the Nova Scotia Not-for-Profit Coalition.

What we do

- We support community-based initiatives in rural Nova Scotia which improve the understanding of issues facing rural communities.
- We convene local people to find local solutions to problems and challenges.
- We support local enhancements for sustainability of rural environments.



What we do

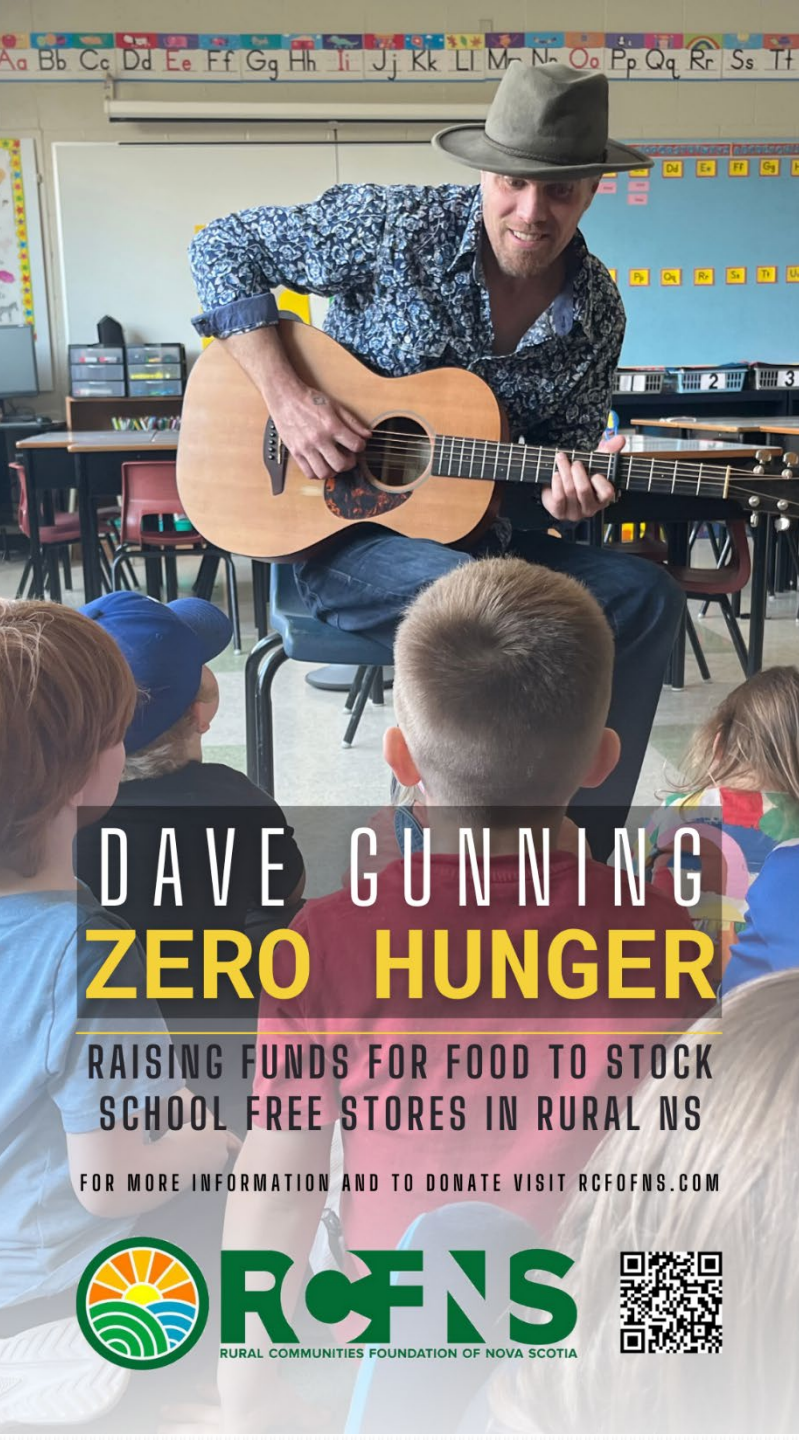
- **Ukrainian Nova Scotia Resettlement Fund**
- **Joan Feynman Climate Change Fund**
- **Housing For Health (opening soon)**
- **Soaring Eagle Fine Arts Grants (opening soon)**
- **Community Impact Conferences**



What we do

- Ukrainian Nova Scotia Resettlement Fund
- Joan Feynman Climate Change Fund
- Housing For Health (opening soon)
- Soaring Eagle Fine Arts Grants (opening soon)
- Community Impact Conferences
- **Dave Gunning Zero Hunger Fund**





DAVE GUNNING ZERO HUNGER

RAISING FUNDS FOR FOOD TO STOCK
SCHOOL FREE STORES IN RURAL NS

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RCFNS
RURAL COMMUNITIES FOUNDATION OF NOVA SCOTIA



Dave Gunning Zero Hunger Fund

- Acclaimed Nova Scotia musician Dave Gunning has teamed up with RCFNS to launch the Dave Gunning Zero Hunger Fund.
- The campaign is aimed at supporting 'Free Pantries' in Nova Scotia schools.
- Our initial goal is to raise \$100,000 to provide grants of up to \$5,000 to local schools.
- Current campaign is focused on Antigonish, Guysborough, Pictou and Richmond counties.

Dave Gunning Zero Hunger Fund

- Our ask:
- Provide individual and corporate awareness and support for the campaign



Dave Gunning Zero Hunger Fund

- Our ask:
- Provide individual and corporate awareness and support for the campaign
- Consider providing a donation to the campaign



Dave Gunning Zero Hunger Fund

- Our ask:
- Provide individual and corporate awareness and support for the campaign
- Consider providing a personal donation to the campaign
- Thank you for your time and consideration!



Procurement: Canoe Procurement

Additional Resources for obtaining lowest prices in purchasing

SUMMARY

Canoe Procurement Group Purchasing Program

Combining the purchasing power of over 5,000 public and not-for-profit organizations throughout the country, Canoe is one of the largest cooperative procurement groups of its kind in Canada. This program gives our members the opportunity to access hundreds of pre-tendered trade programs that leverage the buying power of over 5,000 active members, which in turn saves both time and costs.

BACKGROUND

Canoe Procurement is supported and recommended to member municipalities by the Nova Scotia Federation of Municipalities (NSFM).

Features:

1. Access a wider range of trade-compliant products and services at preferred rates.
2. Additional procurement tool for NSFM's members – non-binding and no obligation to purchase.
3. Procurement compliance to trade agreement legislation.
4. Access to premium brands. Approximately 340 product and equipment vendors.
5. Members select which vendor they want to buy from. The member will purchase/place any orders through the vendor and pay the vendor directly. The vendor delivers the product and is responsible for applicable warranties.
6. Agreements/contract templates available for some services.
7. Full purchasing support from start to finish.

Other Benefits

Increased access to products that have received ethical and sustainable vetting.

CONSIDERATIONS

If the municipality becomes a Canoe Procurement member then we have the ongoing choice on when and how to use the service. A best practice would be to consider Canoe Procurement tools and resources as part of all procurement plans.

The municipality will sign a membership form to join.

As part of standard procurement practices we need to post a message to the Municipal and Provincial procurement sites declaring our intent to participate in a buying group as follows:

"The Municipality of the District of ST Mary's intends to participate in one or more procurements conducted by Canoe Procurement Group of Canada. For further information and access to the Canoe RFP notices, please visit the Canoe Procurement Portal at:

<https://canoe.bidsandtenders.ca/Module/Tenders/en>, www.purchasingconnection.ca or review the Nova Scotia tender site at: <https://beta.novascotia.ca/find-public-tender-notice>. For further information about Canoe, please visit their website at www.canoeprocurement.ca."

RECOMMENDATIONS

That municipal council approve the municipality becoming a member of the Canadian Canoe Procurement group.

That Municipal council requests an update from staff within 7 months that illustrates degree of savings or quality differences achieved.

CMHC Housing Accelerator Fund

February 2024 update on possible Municipal Housing Support Actions

SUMMARY

Letter From the Honourable Sean Fraser

The Municipality received a letter from the Honourable Sean Fraser regarding our municipal housing Initiatives on January 15, 2024. The letter was a response to the municipality's earlier update to the minister on our activities to support growth in housing including details on our application to the GMHC housing Accelerator Fund (HAF).

BACKGROUND

The minister referred us to published advice on Best Practices for Procurement is supported and recommended to member municipalities by the Nova Scotia Federation of Municipalities (NSFM).

Municipal staff have completed a review of the advised material and made contact with CMHC staff for input. This work has identified two effective actions that could be taken by the Municipality as follows:

Both of the following initiatives could be undertaken as part of business action plans that we could take to increase the local housing supply. Both actions could be developed as part of work done with HAF funding.

- 1.) Vetted Building Plans: One way to support a variety of housing initiatives including increased low-income housing and secondary suites effectively would be to provide a selection of pre-planned building plans. This provides easy to use tools for the public.
- 2.) Policy for working with Private Developers. The municipality could research and develop a Council approved policy to guide interactions and arrangements with developers.

CONSIDERATIONS

Identifying initiatives does not alter our standing funding application to HAF but does identify actions we can take.

Staff Report



RECOMMENDATIONS

FYI

2024 2025 Cost of Living Consideration

SUMMARY

The following report is designed to provide Council and staff with direction on the cost-of-living allocation to be applied to salaries, hourly wages and honorariums for the 2024-2025 fiscal year.

BACKGROUND

Each year during budget deliberations Council reviews the Nova Scotia Consumer Price Index (CPI) rate for all items December to December to assist with determining the cost-of-living (COL) rate to apply to salaries, hourly wages and honorariums.

Although Council begins the deliberations with the December-to-December CPI rate as the baseline at the beginning of the budget process the final cost of living has been altered and adjusted to a different rate.

Fiscal Year	NS – All Items Dec to Dec CPI	Municipal Cost of Living Approved
2024-2025	3.6%	TBD
2023-2024	7.6%	3.0%
2022-2023	4.8%	2.5%
2021-2022	0.6%	0.6% Staff & 0.0% Council
2020-2021	2.2%	2.2%

CONSIDERATIONS

Cost of Living Options for 2024/25	Budget Impact
3.6%	\$27,476
3.5%	\$26,712
3.0%	\$22,896
2.5%	\$19,080
2.0%	\$15,264
1.5%	\$11,448

- Budget impact is based on current 2023/24 salaries, hourly wages and honorariums.

Staff Report



RECOMMENDATIONS

For information purposes to aid in the 2024/2025 budget deliberations, council direction on the initial 2024/25 Cost of Living percentage is required to proceed with draft #1 budget.

2024 2025 Recreation Facility Development Grant

SUMMARY/BACKGROUND

The Recreation Facility Development (RFD) Grant is an annual provincial grant program to assist community groups, municipalities and other not for profit organizations to develop facilities in order to increase public participation in sport and physical recreation. Projects approved for funding are eligible to receive up to two-thirds of the total capital costs of the project to a maximum of \$150,000. The deadline for applications is February 14th, 2024.

In 2023-2024 the Municipality received an RFD grant to complete phase 1 of outside building repairs/steal siding for approximately ½ of the building and sprinkler repairs to the St. Mary's Recplex. As part of Council's capital project planning phase 2 of the outside building repairs and steal siding was scheduled to occur in 2024-2025 at \$60,000 Municipal contribution.

At a Council meeting on January 8th, 2024 council passed a motion approving staff to apply for the 2024-25 Recreation Facility Development Funding for Phase 2 of the outside structural repairs and siding replacement to the St. Mary's Recplex.

As part of gathering information to complete the 2024-2025 RFD Grant it was determined by staff that there may be opportunities to include additional components to the 2024-2025 RFD grant.

The three options below include additional components of either replacing the inside rubber flooring/walking track, purchasing a new to us Zamboni or both along with the siding replacement (including wall repairs and exterior lighting).

CONSIDERATIONS

Option A – Phase 2 siding replacement, outside wall repairs, exterior lighting, and replace inside rubber flooring. Total municipal capital contribution of \$60,011.

Option B – Phase 2 siding replacement, outside wall repairs, exterior lighting, and used Zamboni. Total municipal capital contribution of \$64,067.

Option C – Phase 2 siding replacement, outside wall repairs, exterior lighting, replace inside rubber flooring and used Zamboni. Total municipal capital contribution of \$99,780.

Staff Report



RECOMMENDATIONS

A recommendation would be required if Council would like staff to proceed with adding additional elements to the 2024-2025 RFD Grant application. Recommendation would be dependant on the option chosen by Council. If no additional components are added to the grant application, then no further recommendation is required.

Example; council recommends to direct staff to add additional components of _____ to the 2024-2025 Recreation Facilities Development grant application.

Motion Approved at the Regular Council Meeting Monday, January 8th, 2024:

Council agree to direct municipal staff to submit an application to the Department of Communities, Culture, Tourism and Heritage for the 2024-25 Recreation Facility Development/Rink Revitalization Fund for Phase 2 of the outside structural repairs and siding replacement to the St. Mary's Recplex and furthermore directs staff if possible, to apply for grant funding to complete a facility needs assessment for the St. Mary's Recplex.

STAFF REPORT - COTW, FEBRUARY 7th, 2024
SUPPORTING DOCUMENT - 2024-2025 RFD GRANT

2024-2025 RFD Option A	
	Budget Est.
<i>Revenue</i>	
Municipal Capital	60,011
RFD Grant 2/3	120,940
Recoverable HST Rebate	18,591
Total Revenue	199,542
<i>Expenditures</i>	
Exterior Siding Replacement	87,948
Flooring and Installation	50,193
Exterior Lighting	9,600
Window Replacement Section	10,000
Contingency -10%	15,774
HST	26,027
Total Expenditure	199,542

2024-2025 RFD Option C	
	Budget Est.
<i>Revenue</i>	
Municipal Capital	99,780
RFD Grant 2/3	150,000
Recoverable HST Rebate	25,663
Total Revenue	275,442
<i>Expenditures</i>	
Exterior Siding Replacement	87,948
Zamboni	60,000
Flooring and Installation	50,193
Exterior Lighting	9,600
Window Replacement Section	10,000
Contingency -10%	21,774
HST	35,927
Total Expenditure	275,442

2024-2025 RFD Option B	
	Budget Est.
<i>Revenue</i>	
Municipal Capital	64,067
RFD Grant 2/3	128,134
Recoverable HST Rebate	19,747
Total Revenue	211,948
<i>Expenditures</i>	
Exterior Siding Replacement	87,948
Zamboni	60,000
Exterior Lighting	9,600
Window Replacement Section	10,000
Contingency -10%	16,755
HST	27,645
Total Expenditure	211,948

Topic: Fibromyalgia Awareness Day

May 12th, 2024, Fibromyalgia Awareness Day

SUMMARY

May 12th, 2024 is the 32nd anniversary of Fibromyalgia Awareness Day as recognized by the World Health Organization (WHO). The Fibromyalgia Association of Canada contacted, to ask if the Municipality would light up our communities buildings/landmarks in purple, in recognition of the 2-4% of Canadians living with fibromyalgia. That is almost 2 million Canadians who have been diagnosed with fibromyalgia. There are still many more Canadians waiting to be diagnosed or who are not counted in these numbers because they have other primary conditions, such as cancer, cardiac issues, etc. Last year 133 buildings and landmarks across Canada lit up in purple to promote fibromyalgia awareness.

Fibromyalgia Association of Canada would like the Municipality to send them our social media handles, as well as pictures of the buildings, and landmarks lit up in purple to advertise the support shown by the Municipality in their campaign.

BACKGROUND

May 12th, 2024 is nationally known as Fibromyalgia Day. Raising awareness about Fibromyalgia is a small gesture that the Municipality can do to show support and raise awareness. Purple is the colour that Fibromyalgia is recognized with. Some websites you can visit to learn more about fibromyalgia are:

Website: <https://fibrocanada.ca>

Facebook: [FibroCanada2021](https://www.facebook.com/FibroCanada2021)

Twitter: [@fibrocanada](https://twitter.com/fibrocanada)

Instagram: [FibroCanadaFAC](https://www.instagram.com/FibroCanadaFAC)

Pinterest: [@FibromyalgiaAssociationCanada](https://www.pinterest.ca/@FibromyalgiaAssociationCanada)

LinkedIn: [Fibromyalgia Association Canada \(FAC\)](https://www.linkedin.com/company/Fibromyalgia-Association-Canada-(FAC))

The Municipal Office will be illuminating the Municipal Office and Sherbrooke Library in support for fibromyalgia Awareness Day. Last year 133 buildings and landmarks across Canada lit up in purple to promote fibromyalgia awareness.

CONSIDERATIONS

Which Significant Landmarks or Buildings (ex. Municipal Office, Library, etc.)

Staff Report



RECOMMENDATIONS

The Municipal Council supports illuminating the Municipal office and Sherbrooke Library in purple from dusk on May 12th until dawn on May 13th in support of Fibromyalgia Awareness Day.