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ONTARIO FIRST NATIONS
TECHNICAL SERVICES
CORPORATION

ON RESERVE OPERATIONS AND MAINTENANCE POLICY: THE CASE FOR REFORM

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Date: November 23, 2018

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ACRONYM LIST

| | |
|------|---|
| ACRS | Asset Condition Reporting System |
| AFN | Assembly of First Nations |
| AMP | Asset Management Plans |
| CAIS | Capital Asset Inventory System |
| CFMP | Capital Facilities and Maintenance Program |
| CIRC | Canadian Infrastructure Report Card |
| CRM | Cost Reference Manual |
| FNIP | First Nation Infrastructure Investment Plan |
| ISC | Indigenous Services Canada |
| LLC | Life Cycle Cost |
| O&M | Operations and Maintenance |
| OCWA | Ontario Clean Water Agency |
| MMP | Maintenance Management Plan |



EXECUTIVE SUMMARY

The current Indigenous Services Canada (ISC) operations and maintenance (O&M) policy and funding allocation framework and is significantly flawed. The discrepancy between actual O&M costs First Nations experience and ISC contributions (which are based on project costs rather than life-cycle costs), in addition to the lack of a structured asset management policy, leads to higher costs and prevents First Nations infrastructure and community assets from achieving their full life cycles. This situation represents the case of many First Nations in Ontario and illustrates the need for significant policy change. The funding shortfalls experienced by First Nations prevent both the necessary operations and maintenance work and the protection and prolonging of critical community infrastructure. This leads to physical and financial maintenance deficits, which accumulate and compound.

O&M policy must meet the needs of First Nations communities and must ensure that safeguards and proper training are in place to mitigate risks to the life-cycle of critical infrastructure. In its current form, O&M policy fails to achieve this for First Nations. The following section will outline OFNTSC's position with respect to the need for O&M reform.

The problems with the current O&M funding formula, unit prices, and cost indices as defined by the CRM, in addition to problems with the gross/net funding requirements, are well-documented both in government and First Nations publications. The issue is two-fold: on one hand, funding provided for O&M has not increased in spite of increasing O&M costs; and on the other, the funding formula methodology, which determines O&M funding levels is founded upon flawed and dated calculations which do not compare to other data sources employed for off-reserve O&M calculations (e.g. Statistics Canada or RS Means datasets). Additionally, the "net funding requirement" (NFR) is an arbitrary number that has no relationship to reality: if First Nations are without means to supplement O&M funding received by ISC, the O&M simply does not occur.

Evidence exists that supports asset management plans (AMP) as a tool to save costs, prolong infrastructure life-cycles, and overall, improve processes related to O&M. A goal of asset management is to consider full life-cycles of infrastructure assets and extend them by making informed decisions regarding the building, operating, maintaining, renovating, replacing, and disposing of assets. Asset management plans will provide evidence-based needs for the capital, operations, and maintenance investments to achieve and maintain a desired levels of service in First Nations communities.

Asset management systems could further assist First Nations in facilitating better data governance which will result in positive institutional changes to community asset management, improved services and performances, more accurate financial planning, and ultimately reduced life cycle expenditures and premature replacements.

Operator training, and salaries levels remain outstanding issues in the broader O&M reform discussions. There is a clear need for proper training dollars and fair operator compensation commensurate with off-reserve O&M professionals. Indeed, O&M reform must also provide greater resources for the costs associated with primary and secondary operator training and succession planning to ensure gaps in O&M personnel are mitigated in advance of potential vacancies. In addition to this, and there is a need to address the wage disparity between on-



reserve and off-reserve O&M personnel salaries and benefits. It is also understood that increasing O&M to allow an increased salary will help in reducing operator turn-over.

Decisions about maintaining, replacing and repairing on reserve infrastructure have significant consequences not only for a First Nation's bottom line, but also for community health and wellness, and the natural environment. Many First Nations communities experience complex challenges in the management of infrastructure assets. These challenges include not only a perpetual shortage of housing, infrastructure, and funding to operate and maintain assets, but also the lack of tools and capacity to effectively manage assets. To contrast, municipalities enjoy consistent expenditures from year to year, assumed to be a result of predictable budgets, and a focus on asset management strategies.

The following report makes four key recommendations, which include the following, and are fleshed out further in the report:

- Recommendation #1: Move Away from Existing O&M Policy Framework Towards Asset Management Plans
- Recommendation #2: Update Cost Reference Manual as Interim Measure Towards Development of Asset Management Plan
- Recommendation #3: Develop and Implement First Nations Infrastructure Report Card
- Recommendation #4: Ensure Fair Wages, Salaries & Benefits for O&M Operators

OFNTSC is ideally suited to provide advisory services to First Nations for whole life cycle of infrastructure assets including both capital and O&M funding. OFNTSC envisions a future where First Nations have the capacity and resources to maximize the lifespan of their community assets, are able to plan and respond to climate change risks, and where asset management planning strategies characterize the operations and maintenance of critical community infrastructure and are inclusive of a cultural component. To this end, OFNTSC has been working on asset management planning for Ontario First Nations, including the development of the First Nations Infrastructure Resilience Toolkit.

As a technical service provider, an opportunity exists for OFNTSC to become a centre of excellence for the provision of sustainable asset management planning for First Nation Communities in Ontario. OFNTSC will also be working with AFN on the development of a new O&M policy framework, and is currently designing an Ontario-based AMP pilot.



1.0 PURPOSE/INTRODUCTION

The current Indigenous Services Canada (ISC) operations and maintenance (O&M) policy and funding allocation framework and is significantly flawed. The discrepancy between actual O&M costs First Nations experience and ISC contributions (which are based on project costs rather than life-cycle costs), in addition to the lack of a structured asset management policy,¹ leads to higher costs and prevents First Nations infrastructure and community assets from achieving their full life cycles. This situation represents the case of many First Nations in Ontario and illustrates the need for significant policy change. In addition to ensuring assets reach their full life cycle, proper O&M is widely regarded as the key to mitigating health and safety concerns in First Nations communities. This is especially the case when referring to critical community infrastructure such as water and wastewater facilities.

The funding formulas and cost indices defined by ISC's Cost Reference Manual (CRM) are dated and must be updated in order to eliminate the disparities between ISC allocations and actual O&M costs to First Nations. O&M reform must also provide greater resources for the costs associated with primary and secondary operator training and succession planning to ensure gaps in O&M personnel are mitigated in advance of potential vacancies. In addition to this, and there is a need to address the wage disparity between on-reserve and off-reserve O&M personnel salaries and benefits.

Many of these issues were addressed in the 2009 then-AANDC Audit of the Capital Facilities and Maintenance Program (CFMP); however, no substantive improvements have been developed and implemented in the O&M sector, and the stated programmatic objectives are not being met. In spite of this, in July 2017, the Minister of ISC stated her support for O&M policy reform and committed to collaborate with First Nations (through the Assembly of First Nations (AFN)) to identify options for the co-development of a new O&M policy framework that will contribute to address the socio-economic gap in First Nations.² The AFN Chiefs in Assembly, in turn, passed Resolution 80/2017, "Support for Review of Canada's Operations and Maintenance Policy," which outlines the plan to reform O&M policy in Canada. AFN Resolution 80/2017 can be found in **Appendix A**.

The purpose of this paper is to advance OFNTSC's position with respect to the impending changes to ISC's O&M policy. OFNTSC envisions a future where First Nations have the capacity and resources to maximize the lifespan of their community assets, are able to plan and respond to climate change risks, and where asset management planning strategies characterize the operations and maintenance of critical community infrastructure and are inclusive of a cultural component. To this end, OFNTSC has been working on asset management planning for Ontario First Nations, including the development of the First Nations Infrastructure Resilience Toolkit. As a technical service provider, an opportunity exists for OFNTSC to become a centre of excellence for the provision of sustainable asset management planning for First Nation Communities in Ontario.

¹ Asset Management incorporates the full costs of maintaining assets through a combination of best practices applied to physical assets and an objective to provide required levels of services in the most cost-effective manner. Asset management systems could assist First Nations in facilitating better data governance which will result in positive institutional changes to community asset management, improved services and performances, more accurate financial planning, and ultimately reduced life cycle expenditures.

² Assembly of First Nations. "Operation and Maintenance: Summary Report." 2018: 4.



2.0 BACKGROUND

Operations and Maintenance is typically defined as follows: where operations are the performance of work or services and the provision of materials and energy to ensure the day to day proper functioning of an asset, maintenance refers to the work performed on an asset to preserve it as near as practical to its original condition and to realize its normal life expectancy.³ For on-reserve First Nations, ISC provides subsidies for the operations and maintenance of community infrastructure. The following section will: outline the respective responsibilities of both First Nations and the federal government where O&M is concerned; describe how O&M funding allocations are determined; discuss recent budget federal commitments as they relate to O&M; and will provide an overview of the federal O&M investments in Ontario.

2.1 FEDERAL AND FIRST NATIONS O&M RESPONSIBILITIES

ISC provides O&M funding to First Nations as a matter of social policy, rather than a treaty or rights-based obligation. In addition to O&M, ISC supports the planning, acquisition, design, construction, and disposal of First Nations capital assets, through two main programs: the Capital Facilities and Maintenance Program (CFMP), and the First Nations Infrastructure Investment Fund (FNIF). The level of O&M funding provided to First Nations varies from 20 percent to 100 percent depending on the type of asset, First Nations are expected to make up the difference in O&M funding through user fees or other sources of revenue.⁴ First Nations are also expected by law to comply with a series of federal statutes and regulations (see **Appendix B**) with respect to ISC funded infrastructure.

The objective of the CFMP is to provide First Nations with financial support to: invest in physical assets (or services) that mitigate health and safety risks in their communities; ensure that assets meet established codes and standards; ensure that assets are managed in a cost-effective and efficient manner that protects, maintains and maximizes asset life cycle; and ensure that the above activities are undertaken in an environmentally sound and sustainable manner.⁵ CFMP asset categories include the following:

- Water supply, treatment and distribution systems;
- Wastewater collection, treatment and disposal systems;
- Solid Waste collection and disposal;
- Elementary and secondary educational facilities;
- Housing;
- Roads and bridges;
- Fire protection including fire halls, fire vehicles and firefighting equipment;
- Electrical power generation and distribution;
- Community buildings such as community/recreation halls and band offices;
- Bulk fuel storage and distribution (non-commercial use);
- Structural Mitigation;

³ Indigenous and Northern Affairs Canada. "Protocol for INAC-Funded Infrastructure." 2016.

⁴ Indigenous and Northern Affairs Canada. "Protocol for INAC-Funded Infrastructure." 2016.

⁵ Aboriginal Affairs and Northern Development Canada. "National First Nations Infrastructure Investment Plan, 2015-2016." 2015: 5.



- Waste Management;
- Energy Systems;
- Remediation of contaminated sites;
- Land acquisition for approved community expansion; and
- Connectivity.

CFMP funding is allocated by ISC headquarters to the regions based on a ‘global’ funding methodology adopted in 1998-1999. Here, funds for the delivery of most programs to First Nations are transferred to regions as a single block or the ‘core budget,’ which includes funding for minor capital and O&M expenditures.⁶

The FNIF is a proposal-based program that provides infrastructure funding to First Nation communities who have developed a First Nation Infrastructure Investment Plan (FNIIP) which identified all eligible infrastructure projects. Annual FNIIPs and supporting documents are then submitted to ISC. There are eight categories of projects eligible for funding through the FNIF:

- planning and skills development;
- solid waste management;
- roads and bridges;
- energy systems;
- connectivity;
- structural mitigation;
- cultural and recreational facilities; and
- fire protection.

In partnership with ISC, First Nations develop their FNIIP to strategically plan investments, in the short and medium term, while supporting a base of infrastructure that protects the health and safety and enables engagement in the economy. In addition to FNIIP’s, First Nations are expected to develop and implement Maintenance Management Plans (MMPs) for major capital assets. First Nations are then required to carry out the O&M of community infrastructure, housing, and assets in accordance with their Council-approved MMP, which is made available to ISC. A First Nations MMP must identify the following:

1. An up-to-date inventory of all infrastructure and housing assets for which O&M funds are provided by ISC;
2. The maintenance activities and their frequency that will be conducted for each asset;
3. An estimate or the most recent three-year average total annual cost of operating and maintaining all community infrastructure and housing assets for which a funding subsidy is provided by ISC;
4. Measures to ensure that satisfactorily trained personnel are available at all times to operate and maintain technical systems according to the design standards of the specific facility or asset (e.g., for water and wastewater treatment plants, operators shall be certified to the level of the plant);
5. The provision of adequate fire protection services; and

⁶ Indian and Northern Affairs Canada. “Audit of the Capital Facilities and Maintenance Program.” 2009: 12.



6. The data that is necessary to update the Integrated Capital Management System (ICMS) by reporting deadlines.

The primary instrument to monitor and support First Nations in achieving O&M performance objectives is the Asset Condition Reporting System (ACRS). Through ACRS, ISC undertakes inspections in all regions as a means to indirectly assess the extent to which O&M activities are being undertaken by First Nations. These inspections target one third of all First Nations each year where reports are produced that include general and specific asset conditions, the identification of asset deficiencies and an assessment of criticality with recommendations to address these deficiencies. First Nations have responsibility to act on recommendations to address asset deficiencies.⁷ The 2009 ISC audit of the CFMP found that significant gaps exist in ISC's regional controls over the management of O&M funding.⁸ Further, the audit found that the lack of sufficient management and oversight has contributed to the shortened life span of First Nations critical community assets.⁹

O&M funding agreements carry terms and conditions by which First Nations must abide, which identify the minimum performance obligations of the First Nation. Examples of terms and conditions include adherence to codes and standards for the design, construction, operation and maintenance of facilities. First Nations or Tribal Councils that fail to meet the terms and conditions of a funding arrangement are deemed to be in default of a contract, and in such cases, ISC may take action to remedy the default to ensure that necessary O&M work is carried out.

2.2 O&M FUNDING FORMULA

As will be discussed later in the paper, perhaps the most compelling case for O&M reform lies in framework through which O&M funding is allocated. The determination of O&M contributions varies from region to region; however, all regions start with ISC's Cost Reference Manual, and an internal database, maintained by ISC, named the Integrated Capital Management System (ICMS), formally known as Capital Asset Inventory System (CAIS), which contains capital asset information for First Nations and is used to calculate the annual O&M gross and net funding requirements for First Nations. Estimates of the O&M funding requirements for funded assets are generated by the ICMS using the asset location, type and quantity data together with a cost look-up table that is linked to the CAIS.¹⁰ In order to receive O&M funding, capital assets must be included in the ICMS. Updates to ICMS are done on an annual basis, as required by O&M funding requirements.¹¹

The gross funding requirement (GFR) is that amount required to operate and maintain a facility to generally accepted standards, while amount of subsidy, the net funding requirement (NFR), is the GFR less any amount the operator or administrator received as a result of user fees or other income, typically varying between 20-100% of the GFR. According to ISC, only in the case of education facilities is O&M funded at 100% of the net funding requirement; however, this 100% of value is determined by ISC calculations rather than actual need, and as will be described later in the paper, does not amount to full funding for education-related O&M costs. Regardless of

⁷ Indian and Northern Affairs Canada. "Audit of the Capital Facilities and Maintenance Program." 2009: 18.

⁸ Ibid, ii.

⁹ Ibid, 20.

¹⁰ Ibid, 18.

¹¹ Indigenous and Northern Affairs Canada (2016). "Protocol for INAC-Funded Infrastructure."



this, in policy, apart from education, O&M funding is determined according to cost-sharing levels between ISC and First Nations. Typically, ISC's contributions to O&M costs is subject to approval and availability of funds.

The Cost Reference Manual (CRM) was first published in the mid-1980s to support funding decisions for construction, operations and maintenance activities in First Nations communities across Canada. The CRM has seen few updates, with the most recent updates occurring in 1996 and 2004, and as a result, the CRM is widely seen as an outdated means to determine accurate O&M costs. A 2009 ISC audit of the CFMP concurred with this sentiment, stating that CFMP funding allocations from ISC Headquarters to the regions is “based on dated reference levels.”¹² According to the Cost Reference Manual, O&M costs are determined in the following manner: O&M costs (GFR) = Base Unit Cost \times City Centre Index \times Zone (Remoteness) Index \times Asset Count.

Up until 2005, the Cost Reference Manual (CRM) was “published” annually. Although the CRM was updated annually, the changes primarily focused on updating current formulas for inflationary changes. The formulas were derived much further back. After 2005, the formulas have continued to be updated for inflation, however it has been done electronically in ISC's Integrated Capital Management System. A 2012 update to the CRM was listed in audits as a deliverable to be undertaken with First Nations and Tribal Councils, and while this joint effort never occurred, the update is shown to have happened and ultimately never released.

A 2007 report commissioned by ISC (then INAC), and produced by Hanscomb, found that while the approach of the CRM is “generally acceptable,” there is concerns that “without a bridge between the current update approach and the original methodology, the [CRM] is at risk of producing estimates that may not reflect regional market conditions.”¹³ The original methodology, according to the report, has not been carried forward in time, and site specific factors have not been updated since the inception of the CRM.¹⁴ For example, as ‘city centre index’ (in the case of Ontario, Toronto) is a metric in determining O&M costs, the Hanscomb report found that in the absence of meaningful updates, the CRM may not reflect actual and probable costs in Toronto, and that over time, regional differences by asset class are no longer reflective of CRM city centre indices.¹⁵ While the report recommended that the CRM cost trending be updated in a more robust way reflecting an appropriate level of precision, and that users of guide must be consulted, no substantive changes have occurred within the CRM.

2.3 FEDERAL COMMITMENTS

Budget 2016 announced approximately \$4 billion to improve First Nations community infrastructure through ISC programs. This investment included: \$1.8 billion over five years to improve on reserve water and wastewater infrastructure; \$409 million over five years to improve solid waste management on reserve; and \$255 million over two years to the First Nation Infrastructure Fund.¹⁶ In spite of these commitments, a 2017 Parliamentary Budget Office report

¹² Indian and Northern Affairs Canada. “Audit of the Capital Facilities and Maintenance Program.” 2009: 18.

¹³ Indian and Northern Affairs Canada. “Cost Reference Manual: Update on INAC Cost Reference Manual.” 2007: 8.

¹⁴ Ibid, 8.

¹⁵ Ibid, 24.

¹⁶ Government of Canada (2016). “Budget 2016: Growing the Middle Class.” Ministry of Finance.



stated that the allocations, where water and wastewater allocations are concerned, remain insufficient.¹⁷ Budget 2017 proposed to invest an additional \$4 billion over 10 years through the Investing in Canada Plan, starting in 2018–19, to build and improve community infrastructure in partnership with Indigenous peoples.¹⁸

In addition to budget commitments, Canada committed to the “full implementation” of the *United Nations Declaration on the Rights of Indigenous Peoples* (UNDRIP) in Canadian law and policy “without qualification.” With respect to operations and maintenance, the UN Declaration states:

Article 19: States shall consult and cooperate in good faith with the Indigenous peoples concerned through their own representative institutions in order to obtain their free, prior and informed consent before adopting and implementing legislative or administrative measures that may affect them.

Article 23: Indigenous peoples have the right to determine and develop priorities and strategies for exercising their right to development. In particular, Indigenous peoples have the right to be actively involved in developing and determining [...] their own institutions.

The above articles are relevant to the O&M discussion insofar as Canada continues to implement administrative measures that relate to O&M, for example, the CRM, which continue to have adverse effects on First Nations’ ability to adequately protect and preserve their critical community infrastructure.

In July 2017, the Minister of ISC stated her support for O&M policy reform and committed to collaborate with First Nations (through the Assembly of First Nations (AFN)) to identify options for the co-development of a new O&M policy framework that will contribute to address the socio-economic gap in First Nations.¹⁹ The AFN Chiefs in Assembly, in turn, passed Resolution 80/2017, “Support for Review of Canada’s Operations and Maintenance Policy,” (see Appendix A) which outlines the plan to reform O&M policy in Canada.

In March 2018, the AFN hosted an O&M expert meeting to seek input on how a revised policy framework should look. Flowing from this meeting were a number of recommendations, including namely, that First Nations adopt an asset management approach to O&M.²⁰ Currently, the AFN is working with the regions to develop asset management pilot projects which will develop fully costed asset management plans. When complete, the findings will be compared to current ISC O&M funding levels to help inform ISC of the new levels of funding required to support the asset management approach for the future. The results of the AFN-sponsored pilots are expected to be complete by early 2019. With respect to linkages to the *Safe Drinking Water Act* in 2013, ISC has agreed that the *Act* may need to be repealed and replaced with legislation ‘co-developed’ with First Nations (through the AFN). This work is ongoing and will influence how that new water and wastewater legislation approaches O&M funding for First Nations water

¹⁷ Parliamentary Budget Office (2017). “Budget Sufficiency for First Nations Water and Wastewater Infrastructure.”

¹⁸ Government of Canada (2017). “Budget 2017: Building A Strong Middle Class.” Ministry of Finance.

¹⁹ Assembly of First Nations. “Operation and Maintenance: Summary Report.” 2018: 4.

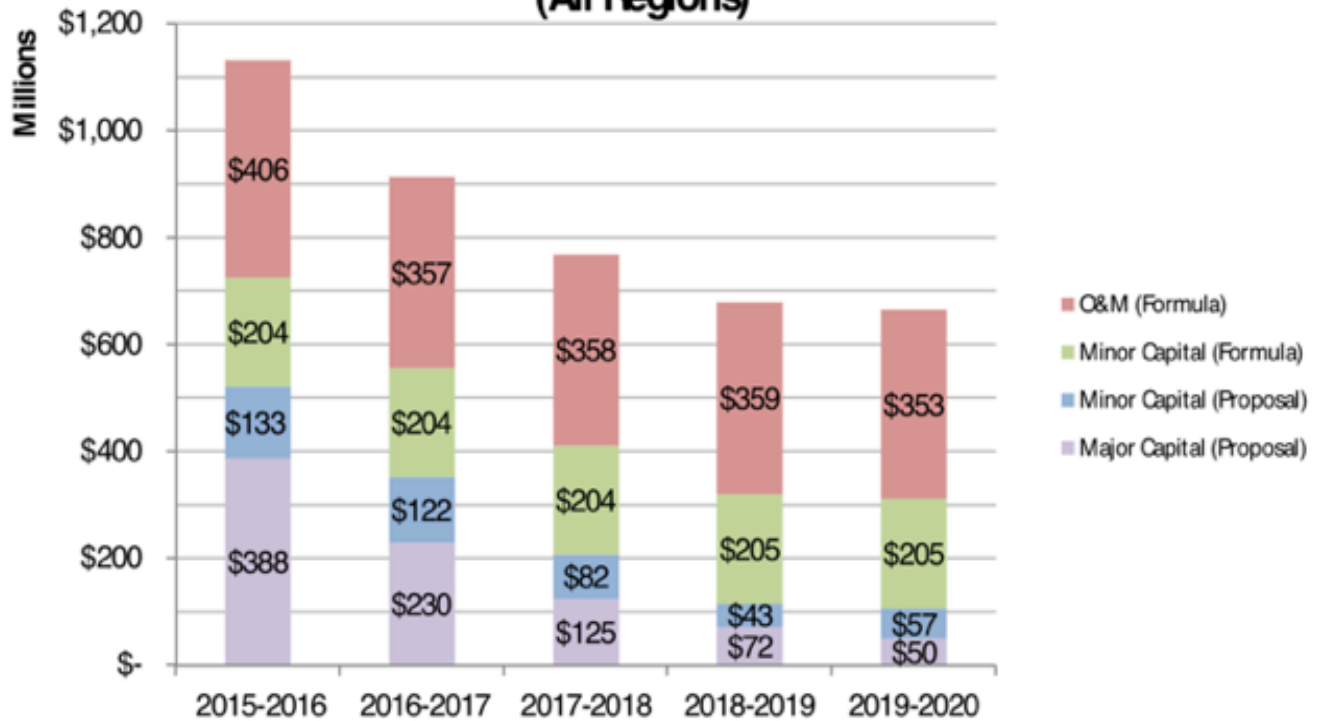
²⁰ Ibid.



and wastewater infrastructure.

Current O&M contributions are depicted below in Figure 1. In spite of ISC’s commitments to develop new solutions for O&M, including the above-mentioned asset management pilots, O&M contributions for all regions are projected to decrease from \$359 million for fiscal year 2018-19 to \$353 million for fiscal year 2019-20.²¹ On top of this, Figure 1 depicts a downwards trend in spending on not only O&M, but also minor and major capital.

**Figure 1 – Planned ISC Funding for All Regions
2015-2016 to 2019-20 Planned Funding by Funding Stream
(All Regions)**



Source: INAC (2015), “National First Nations Infrastructure Investment Plan, 2015-2016,”

2.4 INVESTMENTS IN ONTARIO

According to Table 1, planned O&M spending for Ontario region is set to decline significantly from fiscal year 2014-15 levels through to 2019-20. While planned spending for community infrastructure and education would remain stable, the total planned spending for water and wastewater would be virtually cut in half from the 2014-15 levels to the levels planned for 2016-17 through to 2019-20.

²¹ Assembly of First Nations. “Operation and Maintenance: Summary Report.” 2018: 13.



Table 1 – Planned ISC Funding for Ontario Region

Ontario Summary

| Project Category | Previous Year (Planned Amount in 2014-2015) | Planned Spending | | | | |
|--|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 | 2019-2020 |
| Proposal Based Capital Projects | | | | | | |
| Community Infrastructure | 40,550,797 | 20,525,582 | 12,789,257 | 193,570 | 279,656 | 359,429 |
| Contaminated Sites | 1,943,023 | 1,841,710 | 656,659 | - | - | - |
| Education | 49,712,674 | 41,612,486 | 17,281,113 | 946,311 | - | - |
| Housing | 5,075,000 | 1,340,727 | - | - | - | - |
| Water and Wastewater | 34,950,501 | 45,266,093 | 23,927,436 | 7,039,318 | - | - |
| Sub-Total (Proposal) | \$ 132,231,995 | \$ 110,586,598 | \$ 54,654,465 | \$ 8,179,199 | \$ 279,656 | \$ 359,429 |
| Formula Driven Capital | | | | | | |
| Community Infrastructure | 23,496,174 | 23,183,305 | 23,183,305 | 23,183,305 | 23,183,305 | 23,183,305 |
| Contaminated Sites | - | - | - | - | - | - |
| Education | 1,991,954 | 1,916,517 | 1,916,517 | 1,916,517 | 1,916,517 | 1,916,517 |
| Housing | 22,531,915 | 22,318,234 | 22,318,234 | 22,318,234 | 22,318,234 | 22,318,234 |
| Water and Wastewater | - | - | - | - | - | - |
| Sub-Total (Formula) | \$ 48,020,043 | \$ 47,418,056 | \$ 47,418,056 | \$ 47,418,056 | \$ 47,418,056 | \$ 47,418,056 |
| Operations & Maintenance | | | | | | |
| Community Infrastructure | 39,568,318 | 37,290,688 | 37,220,688 | 37,220,688 | 37,220,688 | 37,220,688 |
| Contaminated Sites | - | - | - | - | - | - |
| Education | 35,736,940 | 35,669,354 | 35,669,354 | 35,669,354 | 35,669,354 | 35,669,354 |
| Housing | 6,951,334 | - | - | - | - | - |
| Water and Wastewater | 41,251,600 | 31,684,444 | 22,058,034 | 22,058,034 | 22,058,034 | 22,058,034 |
| Sub-Total (O&M) | \$ 123,508,192 | \$ 104,644,486 | \$ 94,948,076 | \$ 94,948,076 | \$ 94,948,076 | \$ 94,948,076 |
| Grand Total | | | | | | |
| Community Infrastructure | 103,615,289 | 80,999,575 | 73,193,250 | 60,597,563 | 60,683,649 | 60,763,422 |
| Contaminated Sites | 1,943,023 | 1,841,710 | 656,659 | - | - | - |
| Education | 87,441,568 | 79,198,357 | 54,866,984 | 38,532,182 | 37,585,871 | 37,585,871 |
| Housing | 34,558,249 | 23,658,961 | 22,318,234 | 22,318,234 | 22,318,234 | 22,318,234 |
| Water and Wastewater | 76,202,101 | 76,950,537 | 45,985,470 | 29,097,352 | 22,058,034 | 22,058,034 |
| Grand Total | \$ 303,760,230 | \$ 262,649,140 | \$ 197,020,597 | \$ 150,545,331 | \$ 142,645,788 | \$ 142,725,561 |

Source: INAC (2015): "National First Nations Infrastructure Investment Plan, 2015-2016,"

The data contained in Table 2 shows the actual funding received by Ontario region over a three fiscal year period. In contrast to Table 1, actual funding far exceeds planned funding. The actual figures show that from fiscal year 2015/16-2016/17 funding increased by 1.2%, and increased an additional 0.6% to 1.8% in fiscal year 2016/17-2017/18. Water and wastewater, which shows a large drop in funding in 2015/16-2016/17, followed by a substantial increase in 2016/17-2017/18, can be explained by the federal government's budget contributions that year in addition to the stated priority of the elimination of boil water advisories.

| ONTARIO REGION ACTUALS – OPERATIONS AND MAINTENANCE | | | |
|--|---------|---------|---------|
| Asset Class | 2015/16 | 2016/17 | 2017/18 |
| EDUCATION FACILITIES | 36.0 | 37.8 | 40.6 |



| | | | |
|---|--------------|--------------|--------------|
| HOUSING | 0.1 | 0.1 | 0.2 |
| OTHER COMMUNITY INFRASTRUCTURE AND ACTIVITIES | 54.3 | 59.7 | 45.9 |
| WATER AND WASTEWATER | 34.0 | 28.5 | 41.2 |
| RENEWABLE ENERGY AND ENERGY EFFICIENCY | 0.8 | 0.5 | 1.0 |
| Grand Total (millions) | 125.1 | 126.6 | 128.9 |

Table 2 – Actual ISC O&M Funding for Ontario Region, 2015/16 – 2017/18

Source: Indigenous Services Canada, 2018.

The above data is limited by the fact that figures representing actual First Nations need are not available (suggesting again the need for asset management plans and proper data collection. In spite of the discrepancies between planned and actual ISC contributions, this data should not be taken as a sign that ISC is going far and above in their commitment to O&M; rather, these vastly different figures highlight the fact that the current policy and funding framework simply are not working and are in dire need of reform.

3.0 THE CASE FOR REFORM

O&M policy must meet the needs of First Nations communities and must ensure that safeguards and proper training are in place to mitigate risks to the life-cycle of critical infrastructure. In its current form, O&M policy fails to achieve this for First Nations. The following section will outline OFNTSC’s position with respect to the need for O&M reform.

➤ ***Actual vs Allocated: O&M Funding Formula and Cost Indices are Failing First Nations***

The problems with the current O&M funding formula, unit prices, and cost indices as defined by the CRM, in addition to problems with the gross/net funding requirements, are well-documented both in government and First Nations publications. The issue is two-fold: on one hand, funding provided for O&M has not increased in spite of increasing O&M costs; and on the other, the funding formula methodology, which determines O&M funding levels is founded upon flawed and dated calculations which do not compare to other data sources employed for off-reserve O&M calculations (e.g. Statistics Canada or RS Means datasets). Additionally, the “net funding requirement” (NFR) discussed earlier in the paper is an arbitrary number that has no relationship to reality: if First Nations are without means to supplement O&M funding received by ISC, the O&M simply does not occur.

If comparing RSMeans²² data for heavy construction with the actual cost indices in the ISC CRM dating back to 1996, it becomes apparent that O&M dollars should have increased by 89% from 1996 to the present. In actuality, funding for heavy construction increased a mere 25%, which has led to 13 years of increasing maintenance deficits. The actual growth in dollars for

²² RSMeans datasets are a North American Industry Standard publisher of Construction Cost Data which is actively monitored by experienced Cost Engineers and published by The Gordian Group, Inc. annually. According to The Gordian Group, Inc., RSMeans datasets represent “the most comprehensive construction cost database in North America.” RSMeans maintain a set of Historical Cost Indexes for various locations over time; one location is Toronto, from 1950 to 2017, which has been used for the purpose of this analysis.



heavy construction also falls well below the 2% funding cap first imposed by the Canadian government in 1996, as a limit placed on annual increases to First Nations budgets. Plotting the growth that would have been expected since 1996 reveals the following in Figure 2.

Figure 2 – RSMeans Heavy Construction Price Indices

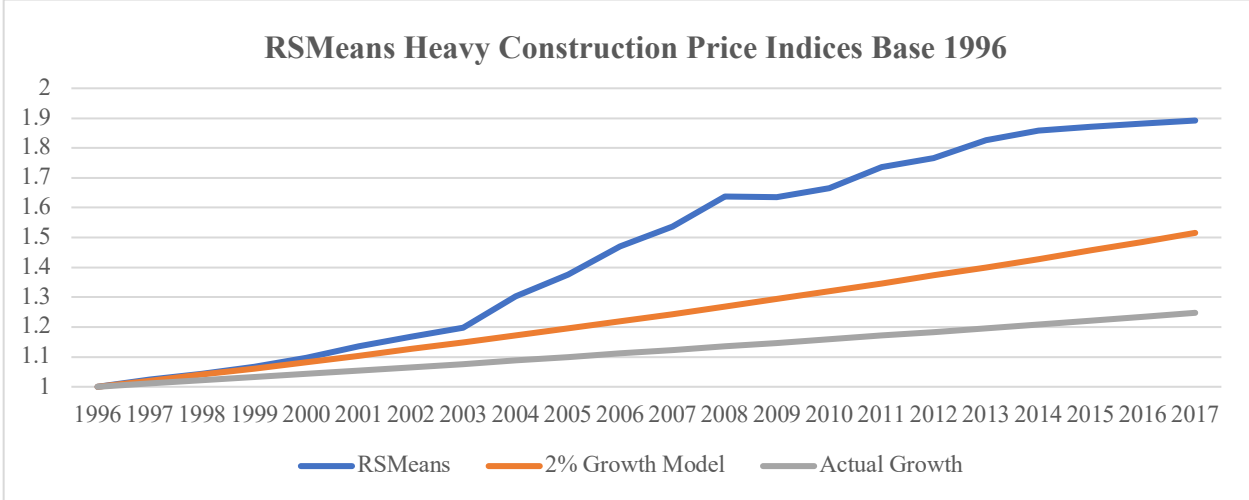
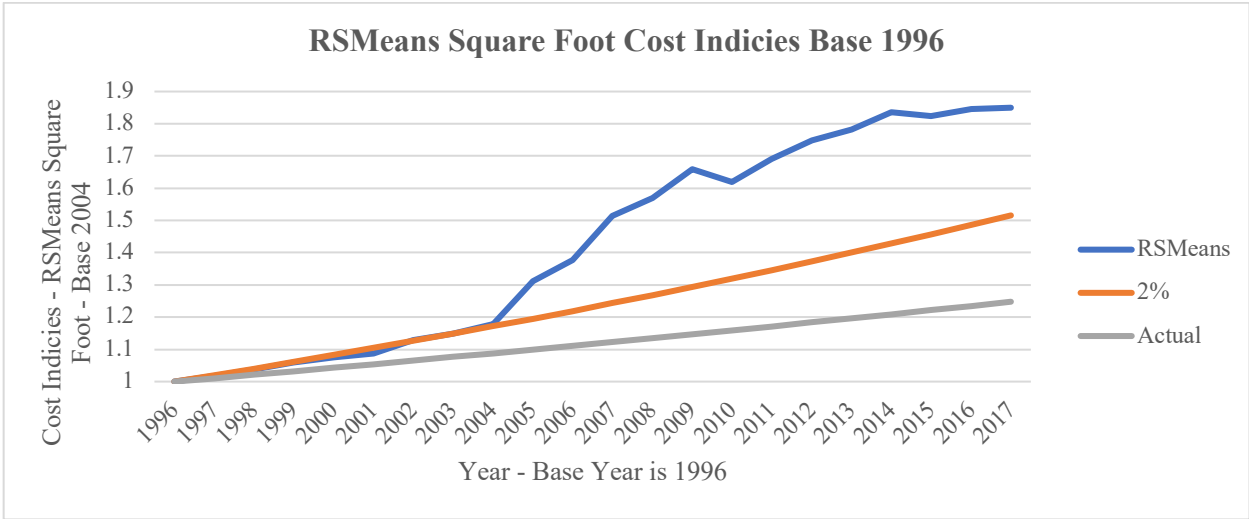


Figure 3 – RSMeans Square Foot Cost Indices



Comparing RSMeans data to square foot cost index data in the CRM similarly shows a significant gap, as depicted in Figure 3. Figure 3 indicates that the 1996 values should have increased by 89% by 2017. The actual growth for O&M contributions for square foot costs remains well under both the RSMeans figures and what the contribution should have been as per ISC’s 2% funding cap. According to Figure 4, this would suggest a required increase of approximately 48%.

As the above information demonstrates, funding on O&M has not been based on ‘need,’ but rather, on arbitrary figures that fall below both off-reserve unit costs and the 2% cap on funding which typically characterizes ISC spending policy.²³

²³ Indian and Northern Affairs Canada. “Audit of the Capital Facilities and Maintenance Program.” 2009: 17.

According to the 2009 CFMP audit, the absence of program funding based on need has resulted in insufficient funding to meet First Nations O&M requirements.²⁴ The audit further found that relative proportions of [CFMP] funding allocated to regions has not been altered since the launch of the Global Funding Methodology and effectively since the 1990-1991 re-basing.

Consequently, the current funding allocation to regions is based on dated reference levels and the lack of updated funding allocations to regions “has resulted in the ineffective or inefficient use of these resources, and that more deserving projects are not being funded at an appropriate level.”²⁵

The 2009 audit itself recommended a review of the methodology for allocating CFMP funding from HQ to regions, however, this recommendation has yet to be acted upon.

The chart in **Appendix C** provides a detailed list of assets in addition to their unit prices as identified in the 1996 CRM, the 2004 CRM, and the 2017-18 O&M unit costs provided by ISC. The chart also provides the ratio increase per asset from 1996 to 2017 in addition to the annual compounding rate per asset. Over the 21-year period from 1996 to 2017, the minimum increase to unit rates was 40%, the average was 43%, and the maximum increase was 50%. In terms of the annual compounding increases, the minimum yearly increase was 1.6%, the average was 1.7%, and the maximum annual compounding increase was 1.9%. While these figures do not offer a picture of what the increases *should* have been, they do offer *actual* ISC increases, and suggest that the actual O&M contributions fell short of the 2% funding cap. It is likely, however, that even with a 2% annual increase in unit costs, O&M funding would still be insufficient to meet the O&M needs of First Nations. In short, the figures provided in Appendix C are grossly undervalued.

➤ ***A Move to Asset Management will improve processes related to O&M***

Evidence exists that supports asset management plans (AMP) as a tool to save costs, prolong infrastructure life-cycles, and overall, improve processes related to O&M. A goal of asset management is to consider full life-cycles of infrastructure assets and extend them by making informed decisions regarding the building, operating, maintaining, renovating, replacing, and disposing of assets. Asset management plans will provide evidence-based needs for the capital, operations, and maintenance investments to achieve and maintain a desired levels of service in First Nations communities.

Asset management systems could further assist First Nations in facilitating better data governance which will result in positive institutional changes to community asset management, improved services and performances, more accurate financial planning, and ultimately reduced life cycle expenditures and premature replacements.

OFNTSC’s approach to effective asset management is described below:

1. Investing in community infrastructure is critical for creating sustainable communities. However, First Nations face challenges that endure infrastructure sees their full life-cycle. Recognizing the challenges, OFNTSC intends to create an asset management plan

²⁴ Ibid, 20.

²⁵ Ibid, 12.



that ensures the predictability and safety of all assets are maintained.

2. First Nations should be on the similar page n asset management as municipalities. This would create relevant and realistic benchmarks, along with consistent comparisons. This will help level the playing field and provide a more accurate picture of the state of infrastructure, based on an industry approach.
3. Asset Management processes should be aligned with a community plan and ensure stakeholders and community members place value on the functionality, reliability and health & safety of their infrastructure.
4. Capacity development is paramount to effectively implement an asset management plan in First Nation communities. Training that improves local asset management and creates the skill sets to take asset management from theory to practice, so that communities can optimize delivery of the services that residents need and want, at costs they can afford.

According to the Federation of Canadian Municipalities, asset management planning represents a solution to making better infrastructure investments through its innovative approach to managing physical assets in a way that is socially, environmentally and economically sustainable in the long term.²⁶ Asset management addresses specific infrastructure needs while also preparing for climate change and can help identify the infrastructure investments that make the most financial sense in the long run.”²⁷ In fact, a recent PIEVC climate risk assessment indicate the value of maintaining the infrastructure in a state of good repair and capital investments at the end of its service life, is an important measure to mitigate risks. Asset management promotes investments in preventative maintenance and regular repairs which prolong asset service life, and aid in avoiding premature and costly reconstruction and service disruption.²⁸

The adoption of sound asset management practices over the past decade has helped Canadian municipalities manage their infrastructure deficits and establish acceptable, affordable, and sustainable levels of service for their communities. In Canada, 62% of large municipalities, 56% of medium-sized municipalities, and 35% of small municipalities have formal asset management plans in place.²⁹ The Federation of Canadian Municipalities also administers a federally-funded \$50 million Municipal Asset Management Program designed to help Canadian municipalities make informed infrastructure investment decisions based on sound asset management practices.³⁰

Understanding that there is a clear interest of the federal government and First Nations to move towards an Asset Management approach, it is in First Nations’ best interest to being to develop tools to asset in the transition to asset management.

One tool which could be developed is a First Nations State of Infrastructure Report Card, similar to the Canadian Infrastructure Report Card (CIRC). In 2012, a consortium of four national

²⁶ Federation of Canadian Municipalities. “Municipal Asset Management Program.” 2018.

²⁷ Ibid.

²⁸ Canadian Infrastructure Report Card. 2016: 5.

²⁹ Canadian Infrastructure Report Card. 2016: 6.

³⁰ Federation of Canadian Municipalities. “Municipal Asset Management Program” 2018.



associations (Canada Construction Association, Canadian Public Works Association, Canadian Society for Civil Engineering, and the Federation of Canadian Municipalities) published the first CIRC for core municipal infrastructure. In 2016, the second CIRC was published serving as a powerful communications tool and providing a reliable foundation for decision makers. The CIRC states that “having an objective understanding of the physical condition is an area that requires continued attention;” therefore, intermittent risk assessments and periodic inspections of infrastructure, as in the case of many First Nations as per current O&M policy, are simply inadequate.

According to the Canadian Infrastructure Report Card, “one-third of [Canada’s] municipal infrastructure is in fair, poor, or very poor condition.”³¹ The same statistic is not clearly known for First Nations. In order to have a fulsome picture of the state of First Nations infrastructure, it will be prudent and critical to begin the development and implementation of a First Nations State of Infrastructure Report Card, which can be started with existing data in ACRS and ICMS.

Ensuring Climate Risks are understood and mitigated is a key component of a broader asset management plan. Long-term asset management planning is required to ensure First Nations can begin to rely upon essential services without disruption and will allow First Nations to keep up with technological innovations, plan for population growth, and better deal with the increasing volatility of climate change and other extreme weather events. Planning for population growth will become increasingly important considering the Indigenous population in Canada is growing four times faster than the rest of the country, both off and on reserve.³²

Climate change adaptation strategies are essential for AMPs. To this end, OFNTSC’s (PIEVC) Infrastructure Resilience Toolkit addresses two key issues facing First Nations in Ontario: how to manage assets (infrastructure, facilities, buildings etc.) that provide essential services to communities; and, how to consider and identify future and potential risks due to climate change and uncertainty. The OFNTSC (PIEVC) Infrastructure Resilience Toolkit Framework is depicted in the graphic contained in **Appendix D**.

Many First Nations communities experience complex challenges in the management of infrastructure assets. These challenges include not only a perpetual shortage of housing, infrastructure, and funding to operate and maintain assets, but also the lack of tools and capacity to effectively manage assets. According to the 2009 CFMP Audit, “significant gaps exist in regional controls over the management of [O&M] funding to ensure that key risks are being managed and mitigated.”³³ According to the audit’s findings, the lack of sufficient management, oversight, and monitoring of O&M can lead to shortened life spans for First Nations assets.³⁴ A move to asset management will help to further improve basic management and oversight controls.

➤ ***Ensuring Equity in Operator Salaries will improve O&M of Community Infrastructure***

There is a clear need for proper training dollars and fair operator compensation commensurate with off-reserve O&M professionals. Indeed, O&M reform must also provide greater resources for the costs associated with primary and secondary operator training and succession planning to

³¹ Canadian Infrastructure Report Card. 2016: 4.

³² Kirkup, Kristy. “Canada’s Indigenous population growing 4 times faster than rest of country.” *Global*. October 25, 2017.

³³ Indian and Northern Affairs Canada. “Audit of the Capital Facilities and Maintenance Program.” 2009: ii.

³⁴ Ibid, 20.



ensure gaps in O&M personnel are mitigated in advance of potential vacancies. In addition to this, and there is a need to address the wage disparity between on-reserve and off-reserve O&M personnel salaries and benefits. It is also understood that increasing O&M to allow an increased salary will help in reducing operator turn-over.

Table 3 – Average Water and Wastewater Operator Salaries

| | OIT | Level I | Level II | Level III | Level IV | Unlicenced |
|---|----------|----------|----------|-----------|----------|------------|
| First Nation Operators | \$32,500 | \$36,900 | \$42,800 | \$52,100 | \$48,400 | \$34,700 |
| Municipal Operators | \$52,300 | \$55,100 | \$58,900 | \$62,800 | \$66,800 | \$44,300 |
| OCWA Operators | \$50,700 | \$51,800 | \$52,200 | \$55,700 | \$56,800 | |
| OCWA – Overall Responsible Operators | \$54,900 | \$55,900 | \$56,300 | \$59,900 | \$60,900 | |
| % Less First Nation Operators Earn compared to Municipal Operators | 38% | 33% | 27% | 17% | 28% | 22% |
| % Less First Nation Operators Earn Compared to OCWA | 36% | 29% | 18% | 13%* | 21%* | |

* level III and IV operators are compared to OCWA ORO
 Source: Ontario First Nations Technical Services Corporation, 2018.

With respect to water treatment plant operators, in 2018, OFNTSC undertook an operator salary survey which confirmed this critical need. OFNTSC looked at the salaries of First Nations operators in Ontario and compared them to salaries of operators in municipalities and at the Ontario Clean Water Agency (OCWA). As depicted in Table 3, based on license level, First Nation Operators earn 22% to 38% less than their municipal counterparts and 13% to 36% less than their counterparts at OCWA.³⁵ While operator salaries in the municipalities and with OCWA are generally within 12% of each other, First Nations operators earn significantly less.

While the First Nations salaries varied, the average First Nation operator salary was \$40,200: “14% of the First Nations operators earned less than the current minimum wage of \$14 / hour, and 19% of the operators earned less than the minimum wage of \$15 / hour as of January 1, 2019. 4% earned less than the poverty line for a single-person household of \$20,676 and 61% earned less than the poverty line for a four-person household of \$41,351.”³⁶

According to the water operator salary survey report, low salaries have the potential to increase operator turn-over, which in the context of water and wastewater, can put safe drinking water at risk: “High turnover is expected when operators are not paid a fair wage. This can lead to loss of expertise, can be a contributing factor to drinking water advisories, increased wear and capital costs to the plant if the operators are not knowledgeable, and can be a risk factor in the safety of the First Nations’ drinking water.”³⁷ While ISC recognizes the important of community involvement and the need for trained personnel, the funding available to enable this remains inadequate. While no empirical research has been undertaken on the salaries of other O&M

³⁵ Hamilton, Tricia. “Ontario First Nations Operator Salary Survey.” OFNTSC. 2018: 2.
³⁶ Ibid, 2.
³⁷ Ibid, 5.

personnel on reserve, it can be reasonably assumed that this issue is not confined to water operators.

4.0 RECOMMENDATIONS & NEXT STEPS

RECOMMENDATIONS

The following recommendations range from broad to specific and largely target changes that need to occur at ISC.

Recommendation #1: Move Away from Existing O&M Policy Framework Towards Asset Management Plans

- OFNTSC acknowledges that the policy framework for on reserve O&M is significantly flawed. The funding formulas are arbitrary and antiquated and have left First Nations under resourced to properly perform basic O&M requirements and to plan for the long-term, taking into consideration, for example, risks related to climate change.
- OFNTSC recommends using existing examples and best practices drawn from Canadian municipalities where the successful experience and deployment of asset management can help First Nations develop and implement sound asset management practices considering full infrastructure life cycle costs.

Recommendation #2: Update Cost Reference Manual as Interim Measure Towards Development of Asset Management Plan

- Many First Nation Technical Representative believe Asset Management is the long-term path to identifying appropriate funding levels for asset maintenance, and comparability to municipal funding levels. However, in the interim, OFNTSC strongly recommends that immediate upward adjustments to O&M funding levels are required to slow deterioration on underfunded assets and infrastructure deficits./

Recommendation #3: Develop and Implement First Nations Infrastructure Report Card

- As a tangible measure towards the implementation of an asset management plan, and in order to have a fulsome picture of the current condition of community assets, and the current capital, operations, and maintenance investment needs, OFNTSC recommends the development and implementation of a “First Nations State of Infrastructure Report Card” starting with data currently available.
- A First Nations State of Infrastructure Report Card can achieve benefits than those the municipal CIRCs have produced. A factual report based on a sound methodology will establish a solid and accepted foundation for discussions on mechanisms to fund the capital, operations and maintenance investment needs. Moreover, the report could be utilized at the regional and national levels for the purpose of better program planning.



Recommendation #4: Ensure Fair Wages, Salaries & Benefits for O&M Operators

- OFNTSC recommends that ISC update its funding formula such that First Nations operators are paid a fair wage comparable to what they would earn off-reserve, and further, that a fair escalation factor be included in these rates, such as 2% a year, or a rate in line with the consumer price index.
- OFNTSC recommends that ISC assign a fair wage as average of the salary for municipal water operators and OCWA as summarized in **Appendix E**. (OFNTSC recommends that unlicensed operators are assigned the same salary as Operators-in-training, as First Nations operators hold the same responsibility and liability for providing safe drinking water to the community but may face licensing barriers due to difficulties in meeting the requirements for a GED).

NEXT STEPS

Asset management is here: governments acknowledge it, value and accept the principles identified in this paper. As stated earlier, the AFN is currently working with ISC as per resolutions from the Chiefs in Assembly to develop a new O&M policy framework. OFNTSC supports the ongoing efforts of AFN and ISC in the co-development of a new O&M policy framework and will be working with AFN on this ongoing process. In addition to this, OFNTSC intends to further develop asset management pilots for the Ontario region. More details will be forthcoming in 2019.



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SPECIAL CHIEFS ASSEMBLY
December 5, 6 & 7, 2017, Ottawa, ON

Resolution no. 80/2017

TITLE: Support for Review of Canada's Operations and Maintenance Policy

SUBJECT: Housing and Infrastructure

MOVED BY: Chief Dan George, Burns Lake Indian Band/Ts'il Kaz Koh, BC

SECONDED BY: Chief Lance Haymond, Kebaowek First Nations, QC

DECISION: Carried by Consensus

WHEREAS:

- A.** The United Nations Declaration on the Rights of Indigenous Peoples (UN Declaration) states:
- i.** Article 19: States shall consult and cooperate in good faith with the indigenous peoples concerned through their own representative institutions in order to obtain their free, prior and informed consent before adopting and implementing legislative or administrative measures that may affect them.
 - ii.** Article 23: Indigenous peoples have the right to determine and develop priorities and strategies for exercising their right to development. In particular, indigenous peoples have the right to be actively involved in developing and determining health, housing and other economic and social programmes affecting them and, as far as possible, to administer such programmes through their own institutions.
- B.** The federal government only funds a portion of the estimated costs for the operations and maintenance (O&M) of on-reserve community infrastructure such as buildings, roads and bridges, etc.
- C.** The current funding formulas and cost indices as identified in Indigenous and Northern Affairs Canada's (INAC) O&M Policy are outdated, inadequate, and do not provide sufficient funding for First Nations to protect and prolong the life of their community assets.

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PERRY BELLEGARDE, NATIONAL CHIEF

80 - 2017
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- D. The Assembly of First Nations is committed to working with INAC to identify options for the implementation of a new O&M policy framework and formula that will reflect new infrastructure technologies as well as economic and environmental factors that will contribute to addressing the socio-economic gap in First Nations.
- E. A joint work plan will need to be developed that will identify options for the co-development of a new O&M Policy Framework.
- F. INAC will be requested to commit the necessary resources to undertake engagement sessions with First Nations and regional organizations, and the Chiefs Committee on Housing and Infrastructure and Regional Technicians.

THEREFORE BE IT RESOLVED that the Chiefs-in-Assembly:

1. Support the co-development of new Operations and Maintenance Policy Framework (O&M Policy Framework) with full involvement of First Nations and/or their organizations, the Assembly of First Nations (AFN) and the Chiefs Committee on Housing and Infrastructure.
2. Direct the AFN to jointly develop a Draft Joint Work Plan with Indigenous and Northern Affairs Canada (INAC) and report on progress to the Chiefs Committee on Housing and Infrastructure.
3. Direct the AFN to urge INAC to provide funding to support the Joint Work Plan and the development and implementation of the O&M Policy Framework.

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APPENDIX B: Applicable Federal Statutes and Regulations

Without limitation, the following statutes and regulations are applicable on reserve lands and therefore First Nations are required as a matter of law to comply with the most up to date version of each of the following:

- *An Act respecting the safety of drinking water on First Nation lands, 2013*
- *Canadian Environmental Protection Act, 1999 (S.C. 1999, c. 33)*
- *Canadian Environmental Assessment Act, 2012 (S.C. 2012, c. 19, s. 52)*
- *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations, (SOR/2008-197)*
- *Fisheries Act (R.S.C., 1985, c. F-14)*
- *Wastewater System Effluent Regulations (SOR/2012-139)*
- *Species at Risk Act (S.C. 2002, c. 29)*
- *Indian Reserve Waste Disposal Regulations (C.R.C., c. 960)*
- *Arctic Waters Pollution Prevention Act (R.S.C. 1985, c. A-12)*
- *Canada Petroleum Resources Act (R.S.C. 1985, c. 36 (2nd Supp.))*
- *Energy Efficiency Act (S.C. 1992, c. 36)*
- *Canada Labour Code (R.S.C., 1985, c. L-2)*
- *Canada Occupational Health and Safety Regulations (SOR/86-304)*
- *Hazardous Products Act (R.S.C., 1985, c. H-3)*
- *Hazardous Materials Information Review Regulations (SOR/88-456)*

APPENDIX C: Asset Rates and Ratio Increase Chart



| Asset Description | 1996 O&M Rates CRM | 2004 O&M Rates CRM | 2017-2018 O&M Unit Cost | 1996-2017 Ratio Increase | 1996-2017 Annual Compound Rate |
|--|-----------------------|-----------------------|----------------------------|--------------------------------|--------------------------------------|
| Office | \$ 40.99 | \$ 46.98 | \$ 59.20 | 0.444 | 0.01685 |
| Trade Shop/Workshop (Mun.) | \$ 17.10 | \$ 19.67 | \$ 25.13 | 0.470 | 0.01765 |
| Garage (Municipal) | \$ 17.10 | \$ 20.04 | \$ 25.13 | 0.470 | 0.01765 |
| Warehouse (Band Or School) | \$ 17.10 | \$ 19.67 | \$ 25.13 | 0.470 | 0.01765 |
| School | \$ 49.29 | \$ 54.66 | \$ 69.36 | 0.407 | 0.01565 |
| Daycare Centre | \$ 50.04 | \$ 55.49 | \$ 70.41 | 0.407 | 0.01564 |
| Fire Station | \$ 22.76 | \$ 26.39 | \$ 33.18 | 0.458 | 0.01728 |
| Student Residence | \$ 45.55 | \$ 51.81 | \$ 65.39 | 0.436 | 0.01657 |
| Teacherage | \$ 12.72 | \$ 15.00 | \$ 18.79 | 0.477 | 0.01789 |
| Water Supply Treatment | \$ 17.33 | \$ 20.04 | \$ 24.84 | 0.433 | 0.01650 |
| Wastewater Treatment Disposal | \$ 17.33 | \$ 20.04 | \$ 24.84 | 0.433 | 0.01650 |
| Electric Power Generation | \$ 17.33 | \$ 20.04 | \$ 24.84 | 0.433 | 0.01650 |
| Solid Waste Disposal | \$ 17.33 | \$ 20.04 | \$ 24.84 | 0.433 | 0.01650 |
| Central Heating Plant | \$ 17.33 | \$ 20.04 | \$ 24.84 | 0.433 | 0.01650 |
| Ctty Rec Ctr/Halucult Ctr | \$ 26.04 | \$ 29.72 | \$ 37.45 | 0.438 | 0.01665 |
| Arena | \$ 26.04 | \$ 29.72 | \$ 37.45 | 0.438 | 0.01665 |
| Gymnasium | \$ 26.04 | \$ 29.72 | \$ 37.45 | 0.438 | 0.01665 |
| Indoor Swimming Pool | \$ 26.04 | \$ 29.72 | \$ 37.45 | 0.438 | 0.01665 |
| Club House/Youth Ctr/Sr Cit/Drop-In | \$ 26.04 | \$ 29.72 | \$ 37.45 | 0.438 | 0.01665 |
| Heated Water Mains | \$ 3.14 | \$ 3.78 | \$ 4.72 | 0.503 | 0.01870 |
| Water Mains | \$ 1.92 | \$ 2.20 | \$ 2.78 | 0.448 | 0.01697 |
| Water Treatment System | \$ 19,250.00 | \$ 22,007.98 | \$ 27,789.17 | 0.444 | 0.01683 |
| Water Treatment Unit | \$ 3,165.00 | \$ 3,618.71 | \$ 4,569.29 | 0.444 | 0.01683 |
| Water Storage | \$ 684.00 | \$ 778.04 | \$ 980.38 | 0.433 | 0.01650 |
| Community Wells | \$ 2,840.00 | \$ 3,331.44 | \$ 4,185.52 | 0.474 | 0.01778 |
| Water Standpipes | \$ 725.00 | \$ 818.22 | \$ 1,038.70 | 0.433 | 0.01648 |
| High Level Liftstation | \$ 7,900.00 | \$ 9,256.46 | \$ 11,640.86 | 0.474 | 0.01778 |
| Low Level Liftstation | \$ 3,645.00 | \$ 4,275.60 | \$ 5,371.74 | 0.474 | 0.01778 |
| Sanitary Main | \$ 0.99 | \$ 1.14 | \$ 1.44 | 0.455 | 0.01718 |
| Storm Main | \$ 0.99 | \$ 1.14 | \$ 1.44 | 0.455 | 0.01718 |
| Rbc/Trickling Filter | \$ 17,660.00 | \$ 20,171.78 | \$ 25,470.62 | 0.442 | 0.01679 |
| Extended Aeration Plant | \$ 20,120.00 | \$ 22,981.35 | \$ 29,018.23 | 0.442 | 0.01679 |
| Lagoon | \$ 3,530.00 | \$ 3,949.10 | \$ 5,007.08 | 0.418 | 0.01602 |
| Ctty Septic Tank And Field | \$ 315.00 | \$ 358.34 | \$ 452.66 | 0.437 | 0.01662 |
| Jet-Pump Disposal | \$ 745.00 | \$ 851.29 | \$ 1,075.36 | 0.443 | 0.01682 |
| Liftstation | \$ 6,195.00 | \$ 7,267.27 | \$ 9,130.39 | 0.474 | 0.01779 |
| Aerated Lagoon | \$ 7,750.00 | \$ 8,860.34 | \$ 11,187.83 | 0.444 | 0.01683 |
| Low Pressure Connection | \$ 157.50 | \$ 180.85 | \$ 228.45 | 0.450 | 0.01705 |
| Street Lights | \$ 112.00 | \$ 125.59 | \$ 158.91 | 0.419 | 0.01603 |
| Transmission Lines | \$ 1,150.00 | \$ 1,278.64 | \$ 1,614.52 | 0.404 | 0.01554 |
| Distribution Lines | \$ 2,380.00 | \$ 2,675.60 | \$ 3,385.44 | 0.422 | 0.01615 |
| Refuse Site | \$ 2,130.00 | \$ 2,419.24 | \$ 3,058.54 | 0.436 | 0.01658 |



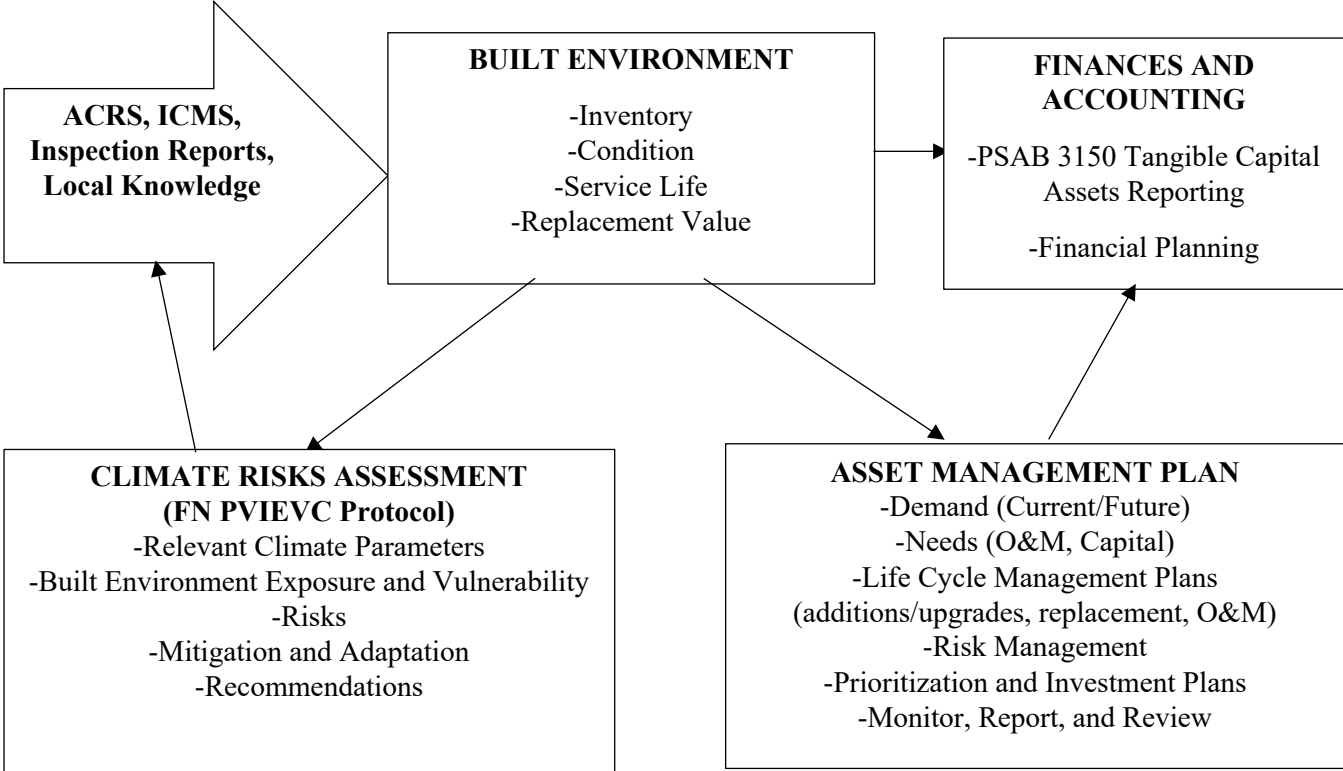
| Asset Description | 1996 O&M Rates CRM | 2004 O&M Rates CRM | 2017-2018 O&M Unit Cost | 1996-2017 Ratio Increase | 1996-2017 Annual Compound Rate |
|---------------------------|-----------------------|-----------------------|----------------------------|--------------------------------|--------------------------------------|
| Landfill Site | \$ 8,650.00 | \$ 9,256.27 | \$ 12,421.65 | 0.436 | 0.01659 |
| Incinerator | \$ 11,620.00 | \$ 13,255.12 | \$ 16,743.99 | 0.441 | 0.01674 |
| Earth Roads | \$ 2,685.00 | \$ 3,024.41 | \$ 3,818.88 | 0.422 | 0.01614 |
| Gravel Roads | \$ 3,920.00 | \$ 4,406.52 | \$ 5,564.05 | 0.419 | 0.01605 |
| Surface Treated Roads | \$ 3,330.00 | \$ 3,735.67 | \$ 4,716.98 | 0.417 | 0.01595 |
| Paved Roads | \$ 3,330.00 | \$ 3,735.67 | \$ 4,718.32 | 0.417 | 0.01597 |
| Vehicular Bridges | \$ 25.60 | \$ 28.60 | \$ 36.11 | 0.411 | 0.01576 |
| Pedestrian Bridges | \$ 25.60 | \$ 28.60 | \$ 36.12 | 0.411 | 0.01577 |
| Large Culverts | \$ 25.60 | \$ 28.60 | \$ 36.13 | 0.411 | 0.01578 |
| Mini-Pumper | \$ 6,780.00 | \$ 7,636.21 | \$ 9,658.11 | 0.425 | 0.01621 |
| Triple Combination Pumper | \$ 7,640.00 | \$ 8,646.51 | \$ 10,924.62 | 0.430 | 0.01639 |
| Compactor | \$ 41,000.00 | \$ 46,630.04 | \$ 58,854.66 | 0.435 | 0.01657 |
| Unmodified Vehicle | \$ 22,820.00 | \$ 25,954.07 | \$ 32,758.24 | 0.436 | 0.01657 |
| Commercial Pumper | \$ 40,100.00 | \$ 45,606.02 | \$ 57,562.18 | 0.435 | 0.01657 |
| Unmodified Vehicle | \$ 22,820.00 | \$ 25,954.07 | \$ 32,758.24 | 0.436 | 0.01657 |
| Commercial Tanker | \$ 40,000.00 | \$ 45,492.24 | \$ 57,418.57 | 0.435 | 0.01657 |
| Unmodified Vehicle | \$ 22,820.00 | \$ 25,954.07 | \$ 32,758.24 | 0.436 | 0.01657 |

APPENDIX D: Climate Risks and Asset Management - OFNTSC Resilience Toolkit

OFNTSC's (PIEVC) Infrastructure Resilience Toolkit addresses two key issues facing First Nations in Ontario: how to manage assets (infrastructure, facilities, buildings etc.) that provide essential services to communities; and, how to consider and identify future and potential risks due to climate change and uncertainty.



The Toolkit Framework is depicted in the graphic below:



APPENDIX E: Water Treatment Plant Operator Salary Scale Recommendations

OFNTSC recommends that ISC assign a fair wage as average of the salary for municipal operators and OCWA’s ORO for the Primary Operator, and the average of the salary for municipal operators and OCWA’s rates for non- ORO for secondary operators, as summarized below:



PRIMARY OPERATORS

- Unlicensed / Operator-in-Training - \$53,600
- Level I - \$55,500
- Level II - \$57,600
- Level III - \$61,400
- Level IV - \$63,900

SECONDARY OPERATORS

- Unlicensed / Operator-in-Training - \$51,500
- Level I - \$53,500
- Level II - \$55,600
- Level III - \$59,300
- Level IV - \$61,800

OFNTSC further recommends that 18% be added to include the cost of providing benefits, the recommended salaries can be seen below:

PRIMARY OPERATORS (including 18% allocated for benefits)

- Unlicensed / Operator-in-Training - \$63,200
- Level I - \$65,500
- Level II - \$68,000
- Level III - \$72,500
- Level IV - \$75,400

SECONDARY OPERATORS (including 18% allocated for benefits)

- Unlicensed / Operator-in-Training - \$60,800
- Level I - \$63,100
- Level II - \$65,600
- Level III - \$70,000
- Level IV - \$72,900

It is recommended that a fair escalation factor be included in these rates, such as 2% a year, or a rate in line with the consumer price index. As a comparison, OCWA's rates are set increase 1% every six months over the next three years.