



Estimating Incremental Cost Indicators for Remote Communities

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Index

| | | |
|--------|---|----|
| 1.0 | Introduction | |
| 1.1 | Purpose of Report | 1 |
| 1.2 | Background | 2 |
| 1.3 | Isolated Post Allowance Adaptation | 2 |
| 1.4 | Interim Calculations in Ontario | 3 |
| 1.4.1 | Salary Component Remoteness Adaptations | 3 |
| 1.4.2 | O & M Component Remoteness Adaptations | 4 |
| 2.0 | Community Expenditure Survey | 4 |
| 3.0 | Data Collection and Various Cost Factors | 5 |
| 3.1. | Incremental Operating Cost in Remote Manitoba Schools | 6 |
| 3.1.1. | School Transportation Cost | 6 |
| 3.1.2. | Operation and Maintenance Cost | 7 |
| 3.1.3. | Student Support Services | 8 |
| 3.1.4. | Instructional & Other Support Services | 9 |
| 3.1.5. | Information Technology Services | 9 |
| 3.2. | Incremental Cost Factors - | 10 |
| 4.0 | Defining Remote & Isolated Communities | 10 |
| 4.1 | Population Factor | 11 |
| 4.2. | Climate Factor | 11 |
| 4.3 | Access Factor | 12 |
| 4.4 | Remoteness Points | 12 |
| 5.0 | Estimating the Average Incremental Cost Differentials in Different Provinces | 14 |
| 5.1. | Average Incremental Cost Factors in Various Provinces | 16 |
| 5.1.1. | Using Indigenous Services Canada Incremental living cost differential | 16 |
| 5.1.2. | Incremental living cost differential | 16 |
| 5.1.3. | Incremental cost of shipping | 17 |
| 5.1.4. | Incremental cost of fuel and utilities | 18 |
| 6.0 | Applying Cost Factors to Ontario Remote and Isolated schools | 19 |
| 6.1. | The Special Purpose Grant | 19 |
| 6.2. | Transportation Grant | 20 |
| 6.3. | School Facility Operation & Maintenance | 20 |
| 6.4. | Per Pupil Illustrative Calculations | 21 |
| 7.0 | Methodological Approach to Estimating a Non-Salary Composite Cost Factor for Remote and Isolated Schools | 22 |
| 7.1. | Estimating Incremental Cost factors | 23 |
| 7.2. | Estimated Cost Factors | 24 |
| 7.3. | Estimating Percentage Incremental Costs | 25 |
| 8.0 | Conclusions & Recommendation | 25 |

Appendices

| | | |
|--------------|---|----|
| Appendix "A" | Community Remoteness Survey | 27 |
| Appendix "B" | Ontario. Salary Calculation Methodology | 33 |
| Appendix "C" | OLS Estimation- Provincial Cost Factors | 36 |
| Appendix "D" | Estimating Remote Incremental Costs | 38 |

Tables

| | | |
|----------|--|----|
| Table 1 | Student Support Expenditures | 8 |
| Table 2 | Instructional & Other Expenditures | 9 |
| Table 3 | Incremental Cost Factors | 10 |
| Table 4 | Population Factor | 11 |
| Table 5 | Climate Factor | 11 |
| Table 6 | Access Factor | 12 |
| Table 7 | Road Accessed Communities | 12 |
| Table 8 | Level of Remoteness Points | 13 |
| Table 9 | Percentage Incremental COL Remote Comm. | 16 |
| Table 10 | Incremental COL Remote Communities | 17 |
| Table 11 | Incremental Cost of Shipping Remote Comm | 17 |
| Table 12 | Percentage Incremental Fuel & Utilities | 18 |
| Table 13 | Selected First Nation Schools | 19 |
| Table 14 | Financing Northern and Remote Schools | 21 |
| Table 15 | Potential Underfunding of Northern Schools | 22 |
| Table 16 | Non Salary as Share of Total Operating | 23 |
| Table 17 | Cost Factors Non Salary by Region | 24 |

1.0 Introduction

1.1 Purpose of Report

Funding for First Nations in Canada is undergoing a much-needed transformation to reflect the costs of providing education programs and services for First Nations students at levels that are at least comparable to those provided by Provincial education systems. The Assembly of First Nations (AFN) joint work on education is guided by Resolution 16/2016, *Honourable Process to Develop Recommendations to Support First Nations Education Reform*.

One of the overall objectives for this process as set out in the Memorandum to Cabinet, is to “Support First Nations Regions to develop their own education funding model that uses the education funding model of that province as a base calculation, plus adaptations and additions that provide funding for the unique needs of First Nation students, communities and schools.”

Provincial comparability provides a point of comparison that is helpful for funders. However, as simple as the comparability principle sounds, the calculations have proven complicated given structural, cultural, geographic and systemic differences between First Nations education, which is a federal responsibility and provincial education which is provincial jurisdiction. Five Joint Task Teams were established comprised of members from Indigenous Services Canada (ISC), the AFN and First Nations regional representatives to pursue this objective.

One of these task teams, the Unique Needs of Northern and Remote Communities Task Team, was supported in some of its work by an advisory committee – the K-12 Funding Experts Task Team. The K-12 Funding Experts Task Team recommended that a study be undertaken to identify the non-salary cost drivers that could be used to calculate the higher costs of delivering education programs and services in northern, isolated and remote communities. This report uses the remoteness definition set out by the National Joint Council (NJC)¹ which assesses the degree of remoteness based on three factors - population, climate and access. This is further examined in Section 4 of this report,

The primary purpose of this report is to provide recommendations and a methodology that can be used to assist in the calculation of the non-salary cost drivers on a community by community basis. The intent is to have an accurate, transparent and community specific cost adjustment model which accurately reflects the actual incremental costs incurred by northern and remote communities in the delivery of education programs and services. The proposed cost adjustment model is based on cost drivers which can be adjusted on an annual basis.

It is also important, that where possible, that ISC and Treasury Board of Canada Secretariat be able to benchmark funding requests through links to Statistics Canada annual costing research.

¹ National Joint Council, “Isolated Posts and Government Housing Directive”, March 1, 2017.

1.2 Background

Several provincial education systems have responsibility for education programs and services in remote and isolated communities. It is the position of ISC that where the provincial systems have a methodology to calculate the extraordinary costs in these communities, that First Nations should - based on the comparability principle – use the same methodology to calculate First Nation incremental costs.

The concept of using a comparability principle to provincial education emerged given that there is no comparable federal elementary/secondary education system. Constitutionally, other than for First Nations, education is a provincial responsibility so provincial comparability was logically chosen as a comparator. Had there been a federal elementary education system one can assume it would have been the comparator. However, it is important to note that for determining the incremental costs of remoteness, there is a federal comparator that is nationally applicable and community specific – the Isolated Post and Government Housing Directive.

Compared to the thirty-one remote First Nation communities in Ontario, the Ontario government operates only four small schools that would fall within the remote or isolated definitions. These schools are funded using the province wide Grant for Student Needs and then adjusted using an actual cost, zero based calculation. This is not a transferable methodology. Consequently, ISC has agreed for the interim funding formula, that in the Ontario Region, a modified Isolated Post Allowance calculation could be used for determining the non-salary portion of the incremental education costs for remote and isolated communities.

1.3 Isolated Post Allowance Adaptation

The Isolated Post and Government Housing Directive is a comprehensive, community-based set of indicators used by the federal government to compensate employees working in remote and isolated communities for the extraordinary costs of living in those communities. The purpose is to assist in offsetting some of the higher costs and to recognize the inherent disadvantages associated with living and working in isolated posts. It is worth noting that when Indian & Northern Affairs Canada operated federal schools in First Nations prior to transfers to local First Nation control which began in Ontario in 1974, staff in these schools were federal employees and did receive the Isolated Post Allowances.

Community specific factors related to three categories set out in the Isolated Post Directive are relevant for calculations related to First Nation education systems:

- Environmental Allowance
- Living Cost Differential
- Fuel and Utilities Differential

In order to apply the Isolated Post directive to an education system rather than as a formula to determine an allowance for employees living and working in isolated communities, it was necessary to develop a unique approach.

1.4 Interim Calculations in Ontario

According to the Frasier Institute², across Canadian education systems the split between salary, employee benefits & travel, and all other non-salary expenditures, is approximately 70%/30%. Using this ratio, two separate calculations were made for the remote and isolated increment. For the salary component, an average teacher salary was determined from provincial board comparators.

While the salary expenditures are not the focus of this study, it is important for context, to include a brief summary of the methodology for calculation of the salary component which was jointly approved by the Chiefs of Ontario and Indigenous Services Canada and used for interim funding.

The Ontario Grants for Student Needs (GSN)³ is designed to fund schools in Ontario wherever provincial schools exist. The various grants and components adjust for geographic, socio-economic and local factors. The GSN is designed to deal with some level of remoteness for provincial schools. However, many First Nation schools and communities fall outside of the GSN comparability by being without road access (or “fly-in”).

The Interim Funding Model was adapted to deal with this extreme level of remoteness for those communities. Each identified community was paired with its Isolated Post Allowance remoteness calculation (or its closest/most similar counterpart community in the IPA).

1.4.1 Salary Component Remoteness Adaptations

By using the Federal Government's Isolated Post Allowance average amounts for Environment, Living Cost and Fuel & Utilities and the GSN estimated average teacher salary, an adjustment factor for each community was determined. This factor was then applied against 70% of the GSN amounts generated by the Interim Funding Model (the portion which was considered as salary-related). The resulting amount is the first part of the remoteness adaptations addressing the remote cost of living.

² Frasier Institute Research Bulletin, September 2015 , [Understanding the Increases in Education Spending in Public Schools in Canada](#) , : “Table 2 - Education Spending allocations, Canada, 2003/04 to 2012/13”

³ Ontario 2017-18 Education Funding: A Guide to the Grants for Student Needs, SSN 2371-0691 (PDF) © Queen’s Printer for Ontario, 2017

The second adjustment made to the salary component was with respect to staff travel to and from communities for those employees not normally resident in the community. By using the Federal Government's Vacation Travel Assistance, a travel rate and frequency was determined for each community.

This amount was applied to 80% of the school's staff (this is the average portion of the staff estimated to be normally resident outside of the remote communities in which they work). The resulting amount is the third part of the remoteness adaptations addressing travel costs of the out-of-community staff.

1.4.2 Operations and Maintenance Component Remoteness Adaptations

The calculation of the Operation and Maintenance component in the Ontario Interim Formula, was determined by using the ISC's Cost Differential analysis and calculating an adjustment factor for each community. This factor was then applied against the model amount for the School Facility Operations Grant. The resulting amount was the second part of the remoteness adaptations addressing operations and maintenance.

Because neither specific expenditures nor a funding methodology on a community by community basis were available for all components included in the non-salary 30% of the budget, ISC estimated a cost factor multiplier based on the employment allowance factor (cost of living differential) and shipping cost differential and applied it only to the School Facility Operations component of the Operations & Maintenance (O&M) portion of the budget for fiscal 2019-2020 allocations. Therefore, in practice, only a small portion (4-5%) of the non-salary components of the budget in fly-in communities was adjusted for remoteness.

The focus of this report is to provide recommendations and a methodology to be applied to the total non-salary (30%) components of the education budgets.

2.0 Community Expenditure Survey

In order to develop and proof the methodology being developed to calculate the non-salary remoteness increment, a survey was developed by the consultants for distribution to First Nations in Canada to gather information on actual expenditures by categories that would be used in the proposed calculations. This data would have allowed the consultants to calculate the percentage of the non-salary budget that each cost driver (budget component) made up. The survey was required given that this information is currently not available from any other source including First Nation audits which are not detailed enough to provide the needed data.

A comprehensive survey (Appendix "A") to collect this data was developed and posted on an electronic platform (Survey Monkey). The survey was designed to be completed by First Nations and First Nations organizations that are operating elementary and secondary schools.

Several notifications were sent to First Nations organizations explaining the purpose and need for this community-based expenditure data and announcements were made at the First Nation Directors of Education National Forum held in Halifax, Nova Scotia, from February 12-14, 2019. Support was also sought from participants at both the Northern and Remote Task Team and the K-12 Funding Experts Table.

Due to the lack of an adequate response, a condensed version was developed and distributed through the members of the Unique Needs of Northern and Remote Communities Task Team. The condensed version of the survey was available in both English and French . The number of returns and the collected data was not comprehensive enough to be used as had been planned.

Given the lack of actual data, this report uses a proxy (Manitoba's Frontier School Division) for illustrative purposes to demonstrate the application of the proposed methodology for calculation of the cost drivers that make up the non-salary portion of the remoteness incremental funding.

3.0 Data Collection and Various Cost Factors

In reviewing websites of the provincial Ministries of Education that serve remote or isolated communities as well as sample First Nations audits available online , it was clear that the required information, with the exception of Manitoba, was not publicly available to undertake the needed funding comparison,. The other consideration in choosing Manitoba as a proxy, was that the Frontier School Division (FSD) does operate remote and isolated schools. Their on-line audits provide sufficient detail to approximate the incremental costs comparing FSD costs with the Provincial averages.

The *Financial Reporting and Accounting in Manitoba Education (FRAME)* Reports set out the Manitoba public school divisions annual revenues and expenditures based on financial and statistical information submitted by school divisions in accordance with FRAME which is the standardized method of accounting and financial reporting for school divisions in Manitoba.

For these reasons the FSD was used to represent remote and isolated schools and calculate percentages and incremental costs of each expenditure category compared to the provincial average. It should be noted that the calculations using FSD as a proxy will underestimate the actual incremental costs for remote and isolated communities given that FSD includes rural non-isolated schools as well as isolated. The report writers attempted, unsuccessfully, to reach out to FSD for their cost breakdown between rural and the remote & isolated schools.

FSD, which is the largest geographical school division in Manitoba includes forty-one schools and operates schools in small communities, which similar to remote and isolated First Nations, are often only accessible by boat, air, rail or winter ice road. The division also includes many First Nations communities. There are 6,115 full-time equivalent students in K-12 in FSD compared to an average of 4,929 per district in Manitoba.

The pupil per teacher ratio equals 15.4 in FSD compared to the provincial average of 16.7. FSD includes schools that have lower numbers of pupils and which are spread much further apart than any other Manitoba school division. Both these factors are cost drivers. We used data from the 2018 FRAME report to estimate some of the incremental cost factors for which no other information is available. We note again, as a caveat, that using FSD as proxy will underestimate the actual increases for remote and isolated First Nations communities given that FSD calculations include some non-isolated communities.

3.1. Incremental Operating Cost in Remote Manitoba Schools

This part of the report examines various incremental cost factors related to remote and isolated schools in Manitoba. The benchmark is the provincial average against which we compare various operating cost in FSD. The cost factors examined include the following:

- School Transportation;
- Operating and maintenance related to the upkeep of buildings and grounds that includes utilities, taxes, insurance and supplies;
- Student support services related to students who have exceptional learning needs;
- Instructional and other support services; and,
- Information technology services.

The other categories of incremental cost factors namely fuel and utilities, freight cost and living cost differential will be estimated in detail in the next section.

3.1.1. School Transportation Cost

The FRAME report defines transportation expenditures to include “all related costs including supervisory and clerical personnel related to the transportation of pupils”. However, it does not include capital. This is consistent with the ISC approach to Funding Transformation which also excludes consideration of capital.

FSD transports 4,950 pupils compared to the provincial average of 1,834 per school division. Total routes traveled in 2017-2018 equaled 1,541,417 km compared to the provincial average of 986,123 km per district. FSD total transportation cost was \$11,491,322 compared to the average per district cost of \$2,869,768. More importantly, it cost FSD \$1,879 to transport each pupil compared to the provincial average of \$582. Transportation expenditures comprised 8.7 percent of the total operating expenditures of the FSD compared to the provincial average of 4.4 percent.

Finally cost per km traveled equaled \$4.82 compared to the provincial average of \$2.47. In other words, FSD schools’ buses not only have to travel longer distances to provide transportation services to their pupils but also incur higher per km cost of transportation.

Using only the per km cost of transportation, the transportation cost in FSD is about 1.95 times higher than the provincial average. In other words, the percentage incremental cost of transportation equals 95.14 in FSD.

However, if we also take into account that the buses in the FSD schools have to travel longer distances and often with lower road quality , then the incremental cost of transporting pupils in the division equals 300.43 percent.

The significantly higher cost of transportation per km traveled as well as higher distances traveled are the main factors causing higher share of transportation budget in the overall operating budget of schools in FSD of 8.7% compared to the provincial average of 4.4%.

3.1.2. Operation and Maintenance Cost

FRAME defines operation and maintenance expenditures as consisting of “all costs, including supervisory and clerical personnel, related to the upkeep, maintenance, and minor repair of all school division buildings and grounds. Includes utilities, taxes, insurance, and supplies.” The category does not include capital costs.

Total operating and maintenance (O&M) cost in FSD equaled \$23,178,918 in 2017-18 compared to the provincial average of \$7,542,787 per division. Average O&M spending per pupil equaled \$3,791 in FSD compared to the provincial average of \$1,530. As mentioned above, the number of full-time equivalent students in FSD equals 6,115 compared to the provincial average of 4,929 per school division. In other words, higher per pupil O&M cost is not due to smaller number of students in the district, but is caused by other factors such as age and condition of buildings, heating costs, cost of supplies, cost of repairs, etc.

In fact, maintenance cost per square foot equaled \$11.72 in FSD compared to the average of \$7.49 in the province. Similarly, repair and replacements cost per square foot equals \$1.54 in FSD compared to the provincial average of \$0.81 per square foot.

The incremental O&M cost varies depending on the indicator one uses. If we use the total O&M cost, then the incremental O&M cost would equal 200.3 percent. In other words, the O&M cost in remote schools is three times greater than the provincial average. If one uses O&M cost per pupil as an indicator, then the incremental cost equals 147.8 percent. In other words, per pupil cost of O&M is 2.478 times greater in FSD compared to the provincial average. Finally, if one uses the average of maintenance and repair cost per square foot, then the incremental cost of O&M equals 54.14 percent. In other words, the O&M cost in FSD is 1.54 times greater than the provincial average.

The fact that the O&M costs are much higher in remote areas is reflected in their share of total operating expenditures. For FSD, the O&M expenditures comprise about 17.6 percent of the operating expenditures compared to the provincial average of 11.4 percent.

The Ontario comparability model indicates that the average O&M cost per square metre in Ontario equals \$83.87. To put this in context, the average O&M cost per square metre in FSD equals \$126.15.⁴ If FSD schools are good proxies for Ontario’s fly-in communities, then the adjustment factor for O&M should be 1.504. In other words, the fly-in communities should have received an increase factor of 50.4 percent. We note that FSD includes many non-fly-in schools. Thus, the an increase factor should have also been applied to remote schools with road access.

3.1.3. Student Support Services

FRAME defines student support services as “consisting of costs specifically related to students who have exceptional learning needs, as well as counselling and guidance and resource costs for all students. Students with exceptional learning needs are students who have physical, cognitive, sensory or emotional/behavioural disabilities. Costs include special education and resource teachers, special needs educational assistants, counsellors, clinicians, and related and appropriate services (e.g. occupational therapists), supplies, textbooks, materials, equipment, and software. Special education coordinators or student services administrators and clerical staff are also included.”

Student support services includes administration and coordination, clinical and related services, special placement, regular placement, other services and counselling and guidance services. Table 1 shows per pupil expenditures on various categories.

Table 1: Student Support Expenditures

| Student Support Expenditure Category | Frontier Division (\$) | Province (\$) |
|--------------------------------------|------------------------|---------------|
| Administration and Coordination | n.a. | 61 |
| Clinical and Related Services | 284 | 263 |
| Special Placement | n.a. | 27 |
| Regular Placement | 1,947 | 893 |
| Other Resource Services | 645 | 626 |
| Counselling and Guidance | 643 | 264 |

Overall, student support services accounts for more than 16.3 percent of FSD’s operating budget compared to the provincial average of 18.4 percent. Overall, per pupil spending on these services equals \$3,520 in FSD compared to the provincial average of \$2,465.

Using per pupil expenditures as our benchmark, the incremental cost of providing those services equals 42.80 in FSD. In other words, the cost of providing those services in FSD schools is 1.428 times greater than the provincial average.

⁴ Note 1 square metre equals 10.76639 square foot. Note, the definition of O&M cost used in the Comparability model appears to be narrower than the one used in FRAME.

3.1.4. Instructional & Other Support Services

FRAME defines instructional and other support services as consisting of “costs related to support services for students, teaching staff, and the educational process, such as libraries/media centres, professional development, and curriculum consulting and development.”

Table 2 presents per pupil cost of delivering those services.

Table 2: Instructional & Other Expenditures

| Category of Services | Frontier Division (\$) | Province (\$) | Incremental Cost (%) |
|---------------------------------------|------------------------|---------------|----------------------|
| Curriculum consulting and development | 462 | 78 | 492.3 |
| Library and media centre | 316 | 179 | 76.5 |
| Professional & staff development | 141 | 127 | 11.0 |
| Other related services | 275 | 60 | 358.3 |
| Total per Pupil | 1,194 | 444 | 168.9 |

Overall, the above services accounts for about 5.5 percent of FSD’s total operating budget compared to the provincial average of 3.4 percent.

3.1.5. Information Technology Services

FRAME defines information technology services as those “services not provided by division personnel respecting the installation and maintenance of computers, computer systems, and data, video and/or multi-media networks, including contracts and maintenance agreements, as well as software licenses, upgrades and annual charges not related to educational software. Also includes dedicated line charges and long distance charges related to the electronic transfer of data and educational programming (e.g. distance education), and Internet access charges.”

These services account for about 0.5 percent of FSD’s operating budget compared to the provincial average of 0.4 percent. Per pupil expenditures equals \$102 in FSD compared to the provincial average of \$51. In other words, the cost of providing these services in FSD schools is twice the average provincial cost. Thus, the incremental cost of information technology services is 100 percent.

3.2. Summary of Incremental Cost Factors in Manitoba’s Frontier School Division

Assuming that the incremental costs incurred by FSD is a good representative of cost to remote and isolated schools in Canada, Table 3 presents a weighted average incremental cost to remote and isolated schools with respect to the factors identified above

Table 3: Incremental Cost Factors

| Cost Factors | Incremental Cost (%) | Share of Operating Expenditures (%) |
|--|-----------------------------|--|
| School Transportation | 222.8 | 8.7 |
| Operating & maintenance | 147.8 | 17.6 |
| Student Support Services | 42.8 | 16.3 |
| Instructional & other Support Services | 168.9 | 5.5 |
| Information Technology Services | 100.0 | 0.5 |
| Weighted Average Cost Indicator | 127.91 | 48.6 |

The per pupil cost was used to calculate a weighted average incremental cost factor. Average provincial cost of each category has been used as the benchmark. Table 3 shows that, excluding salaries of teaching staff, the average cost of operating remote schools is at least 2.279 times greater than the cost of non-remote schools.

Therefore, using FSD to represent remote and isolated schools in other provinces, the cost adjustment factor to be applied to the so-called 30 percent non-salary component must equal 2.279.

4.0 Defining Remote & Isolated Communities

In order to estimate cost indicators for remote and isolated communities, it was first necessary to specify which communities are considered remote and isolated and then study various factors responsible for their incremental cost of operation. There are many different definitions of remoteness that could be used.⁵ This report uses the definition set out by the National Joint Council (NJC).⁶

NJC uses three criteria in order to consider a community as remote or isolated. Points are allocated to classify communities in order of their degree of remoteness – population, climate and access.

⁵ For various definitions of rural and remoteness see Roland Beshiri and Jiaosheng He, “Rural and Small Town Canada Analysis Bulletin”, Statistics Canada, Vol. 8, No. 2, June 2009, Catalogue No. 21-006-X.

⁶ National Joint Council, “Isolated Posts and Government Housing Directive”, March 1, 2017.

4.1. Population Factor

Population size is one of the important determinants of isolation and remoteness. Points are allocated based on the number of people living in a community as follows:

Table 4: Population Factor

| Population | Points |
|----------------|--------|
| 1 – 24 | 70 |
| 25 – 99 | 50 |
| 100 – 499 | 40 |
| 500 – 999 | 35 |
| 1,000 – 1,999 | 30 |
| 2,000 – 4,999 | 25 |
| 5,000 – 7,499 | 15 |
| 7,500 – 9,999 | 5 |
| 10,000 or more | 0 |

4.2 Climate Factor

This factor is based on the degree of wind-chill as well as the length of the period of darkness and annual precipitation and temperature variations. It is based on a climatological index map prepared by the Climatological division of department of transport in Canada.

Table 5: Climate Factor

| Climate Index | Points |
|---------------|--------|
| 80 | 100 |
| 75 | 95 |
| 70 | 90 |
| 65 | 85 |
| 60 | 80 |
| 55 | 75 |
| 50 | 60 |
| 45 | 55 |
| 40 | 50 |
| 35 | 35 |
| 30 | 30 |
| 25 | 25 |
| 20 | 20 |
| 15 | 15 |
| 10 | 10 |

4.3. Access Factor

Communities are classified into two groups. Those with no all-weather road access and those with all-weather road access. Points are allocated to communities without an all-weather road access according to Table 6.

Table 6: Access Factor

| Communities with no All-Weather Road Access | Points |
|--|---------------|
| No all-weather road (automatically assigned) and, additional points allocated as follows | 15 |
| No scheduled air or rail passenger services; or | 15 |
| Scheduled service 1 to 3 days per week; or | 10 |
| Scheduled service more than 3 days per week. | 5 |
| Maximum points possible | 30 |

Communities with all-weather road access are evaluated based on the following table:

Table 7: Road-Accessed Communities

| Distance | Points |
|--|---------------|
| Over 803 kilometres from a population centre more than 15,000 | 15 |
| 483 to 803 kilometres from a population centre more than 15,000 | 10 |
| 402 to 482 kilometres from a population centre more than 15,000 | 5 |
| Less than 402 kilometres from a population centre more than 15,000 | 0 |
| Maximum Points Possible | 15 |

4.4. Remoteness Points

Total points assigned to a community based on the above three factors determines whether a community is classified as remote and isolated or not and its level of remoteness based on the following classification:

Table 8: Level of Remoteness Points

| Level of Post | Point Range |
|------------------|---------------|
| Does not qualify | 0 – 44 |
| 1 | 45 – 54 |
| 2 | 55 – 69 |
| 3 | 70 – 99 |
| 4 | 100 – 134 |
| 5 | 135 or higher |

It is important to note that there are other factors determining a community's classification as remote or not. For instance, communities North of the 60th parallel of latitude are generally assigned as isolated.

Also, a community south of the 60th parallel of latitude may be designated as isolated if:

- a. it has a population of less than 10,000; and
- b. it is not accessible by means of an all-weather road; or
- c. it is accessible by means of an all-weather road, but is more than:
 - i. 161 kilometres by road from a location south of the 60th parallel of latitude with a population of more than 10,000, and
 - ii. 322 kilometres by road from a location south of the 60th parallel of latitude with a population of more than 50,000; and
- d. it is entitled to 45 points or more in accordance with Table 5 above.

Using the above criteria, NJC designates about 300 communities in Canada as isolated. These are communities where the federal government has employees. However, the same criteria can be used to evaluate whether any community is isolated or not.

It is clear from the above criteria that distance and access, while important, are not the only important determinants of remoteness, however they obviously influence the degree of remoteness and consequently the costs of goods and services. The NJC report also estimates living cost differentials (LCD) and fuel and utility differentials (F&UD) for each of the isolated posts they have identified in their report.

Treasury Board of Canada Secretariat updates the living and fuel and utility cost differential classifications based on the information from Statistics Canada. According to the NJC report, an LCD is calculated when the prices for food, household supplies and operations, insurance, transportation expenses, personal care supplies and services, pharmaceutical products (excluding prescribed drugs), entertainment supplies, rental of cablevision/satellite services, reading materials, tobacco and alcoholic beverages are 15 percent higher than the nearest point of comparison.

There are 16 LCD levels based on how high the community's prices are relative to the nearest point of comparison. The points of comparison are Vancouver, Edmonton, Saskatoon, Winnipeg, Toronto, Montreal and St. John's. The F&UD is based on the difference between the cost at an isolated post and the National Composite Billing cost for fuel and utilities.

In addition to the above two indicators, the ISC uses Canada Post data to estimate shipping cost differentials between the isolated posts and the respective shipping cost in the nearest point of comparison and uses it as a proxy for material cost differentials to remote areas. It is calculated as an incremental percentage difference between the shipping cost of a 10 kg package (10-inch cube) from the nearest point of comparison city to isolated post and the cost of shipping within the point of reference city.⁷

They also used regression analysis to estimate cost indicators for remote and isolated communities. Following their approach, this study also uses regression analysis to estimate average provincial/regional indicators for the above three categories of cost differentials in remote communities. We also use other sources of information to estimate other incremental cost factors for which we do not yet have detailed community level data.

5.0 Average Incremental Costs in Remote and Isolated Schools in Different Provinces

The objective of this part of the study is to estimate average incremental cost factors for fuel and utilities, cost of living and freight cost in remote and isolated communities in various regions of Canada. The available data allows us to estimate separate indicators for fly-in communities and those that can be accessed by all-weather road.

The purpose is to estimate an average incremental cost for remote and isolated communities in different regions of Canada.

The four cost factors used in regression analysis are defined as follows:

- Employment allowance factor used by ISC as a proxy for labour cost or cost of living differentials in remote areas.⁸ ISC defines it as a ratio of the following two amounts:
 - Numerator - employment allowances for civil servants in Isolated Posts.
 - Denominator - the national median income for First Nations living on reserve (\$20,337 per person per year from the 2016 census escalated to 2018 amounts to \$21,518).⁹

⁷ Indigenous Services Canada, "ISC-Model for Cost Adjustment Factors based on Remoteness", August 30, 2018.

⁸ This variable was also used by ISC in their regression analysis. Should this be linked

⁹ 2016 Census amount received from INAC. The escalation factors used are 1.23% from 2015 to 2016, 1.7% from 2016 to 2017, and 2% per year onwards based on GL Account 01101. V1 INDETERMINATE CIVILIANS (PSEA).

- The dollar amount of living cost differential (LCD) factor paid to civil servants with dependents in isolated posts where prices for goods and services are at least 15% higher than those available in the location identified as its point of comparison as measured by Statistics Canada and is intended to assist employees in meeting those costs. The amount of LCD depends on the price differentials, as measured by Statistics Canada, between an isolated post and its point of comparison.¹⁰
- Fuel and utility differential paid to civil servants in isolated posts where prices for fuel and utilities are at least 15% higher than the national average expenditure due to transportation costs and consumption rates inherent to the geographical location.

The index is defined as the ratio of the following two values:

- Numerator – fuel and utilities differentials paid to civil servants in isolated posts.
 - Denominator - the average household expenditures on fuel and utilities in Canada in 2017 as reported by Statistics Canada.¹¹
- Shipping cost factor is used as a proxy for material cost differentials to remote areas from point of comparison (PoC) cities.¹² ISC defines as a ratio of the following two values:
 - Numerator - Shipping Costs Differential = Cost of shipping a 10 kg package (10 inch cube) from PoC city to Isolated Post less Cost of shipping within PoC city.
 - Denominator - cost of standard Canada Post shipping of same package within each of the seven PoC cities.

Given the available data, an average regional incremental cost was estimated for the above four indicators for fly-in as well as all-weather road accessed communities in all regions of Canada.

To estimate an average differential cost of the above cost factors in remote and isolated communities in different provinces, we used Ordinary Least Squares (OLS) method. We regressed each of the above cost factors on a set of dummy variables, each representing one of the provinces. In addition, we included one dummy variable for each of the fly-in communities to estimate the differential cost incurred by those communities. Estimation results are presented in Appendix “C”.

The model does not include an intercept and thus the estimated coefficients of the dummy variables show the average regional incremental cost in remote and isolated communities in each of the provinces. All estimated coefficients were statistically highly significant and the goodness of fit coefficients are very high for cross-section data suggesting that the estimated models explain between 82 and 93 percent of the total variations/information in the dependent variables.

¹⁰ The values are taken from the ISC report.

¹¹ Based on Statistics Canada’s “Household spending, Canada, regions and provinces”, average expenditures on fuel and utilities per households in Canada in 2017 equaled \$2,484.

¹² Taken from ISC report, Ibid, 2019

5.1. Average Incremental Cost Factors for Remote and Isolated Communities in Various Provinces

This part of the study presents estimation results for all-weather road as well as fly-in communities in various regions of Canada. We have to note that since the data used pertain to remote and isolated communities, the results presented in this part apply only to such communities. Also, the results represent an average incremental cost for all fly-in communities as well as all-weather road connected remote communities in each region.

5.1.1. Using Indigenous Services Canada's Incremental living cost differential in remote communities

Table 9 shows estimation results using data employed by ISC in their estimation of various cost-factors in remote communities.

Table 9: Percentage Incremental Cost of Living in Remote Communities

| Region | Road Connected Remote Communities (%) | Fly-in Communities (%) |
|-----------------------|---------------------------------------|------------------------|
| Yukon Territory | 42.71 | 108.00 |
| Alberta | 32.94 | 61.00 |
| Quebec | 23.83 | 63.77 |
| Manitoba | 34.50 | 68.62 |
| Saskatchewan | 35.66 | 76.00 |
| Newfoundland | 22.57 | 58.99 |
| British Columbia | 35.18 | - |
| Ontario | 37.45 | 81.70 |
| Nunavut | - | 98.37 |
| Northwest Territories | 79.58 | 103.36 |

Results presented in Table 9 show that, on average, the incremental cost of living in remote, but road connected communities ranges from 22.57 percent in Newfoundland to 79.58 percent in Northwest Territories. For example, on average, the cost of living in all-weather road accessed remote communities in Manitoba is 34.5 percent greater than in Winnipeg. Alternatively, the cost of living in all-weather road accessed remote communities in Manitoba is 1.345 times greater than in Winnipeg.

The incremental cost of living indicator in fly-in communities ranges from 58.99 percent in Newfoundland to 103.4 percent in Northwest Territories. For example, on average, the cost of living in fly-in communities in Manitoba is 1.686 times greater than in Winnipeg.

5.1.2. Average Incremental living cost differential (\$) in remote communities

Using the living cost differentials for various communities, Table 10 shows estimates of the average living cost differentials paid to civil servants with dependents in remote communities in different regions.

Table 10: Incremental Cost of Living in remote Communities

| Region | Road Connected Remote Communities (\$) | Fly-in Communities (\$) |
|-----------------------|---|--------------------------------|
| Yukon Territory | 9,175.9 | 23,228.9 |
| Alberta | 7,101.7 | 13,200.0 |
| Quebec | 5,135.2 | 13,752.5 |
| Manitoba | 7,431.9 | 14,762.0 |
| Saskatchewan | 7,658.2 | 16,356.0 |
| Newfoundland | 4,836.9 | 12,644.6 |
| British Columbia | 7,544.5 | - |
| Ontario | 8,050.4 | 17,602.2 |
| Nunavut | 21,171.5 | 21,171.5 |
| Northwest Territories | 17,117.6 | 22,197.5 |

Table 10 shows the average amount of compensation civil servants receive in different regions to compensate them for the cost of living that is at least 15 percent higher in the above communities compared to their nearest point of comparison.

Table 10 also shows that the living cost differential in road connected remote communities ranges from \$4,836.9 in Newfoundland to \$17,117.6 in Northwest Territories. The cost of living in fly-in communities is higher than road connected ones. The cost differential in fly-in communities ranges from \$12,644.6 in Newfoundland to \$22,197.5 in Northwest Territories.

5.1.3. Incremental cost of shipping in remote communities

Using the ISC data on incremental shipping cost in isolated communities, Table 11 shows the percentage incremental cost of shipping that affects expenditures on a variety of goods purchased in remote communities.

Table 11: Percentage Incremental Cost of Shipping in Remote Communities

| Region | Road Connected Remote Communities (%) | Fly-in Communities (%) |
|-----------------------|--|-------------------------------|
| Yukon Territory | 125.2 | 299.0 |
| Alberta | 50.8 | 223.0 |
| Quebec | 47.0 | 246.1 |
| Manitoba | 27.5 | 132.0 |
| Saskatchewan | 50.1 | 209.0 |
| Newfoundland | - | 184.0 |
| British Columbia | 103.4 | 237.0 |
| Ontario | 109.9 | 217.3 |
| Nunavut | - | 221.4 |
| Northwest Territories | 114.8 | 267.2 |

The incremental cost of shipping in road connected remote communities ranges from 27.5 percent in Manitoba to 125.2 percent in Yukon Territories. The incremental cost in fly-in communities ranges from 132.0 percent in Manitoba to 299.0 percent in Yukon Territories.

5.1.4. Incremental cost of fuel and utilities in remote communities

Cost of fuel and utilities primarily affect operation and maintenance as well as transportation costs which account for a significant share of school budgets in remote and isolated communities. Using the differential cost of fuel and utilities calculated by the government of Canada, Table 12 shows the incremental cost of those items in remote and isolated communities.

Table 12: Percentage Incremental Cost of Fuel and Utilities in Remote Regions

| Region | Road Connected Remote Communities (%) | Fly-in Communities (%) |
|-----------------------|--|-------------------------------|
| Yukon Territory | 99.4 | 215.5 |
| Alberta | 90.9 | - |
| Quebec | - | 55.8 |
| Manitoba | 43.4 | 88.1 |
| Saskatchewan | 104.5 | 208.2 |
| Newfoundland | - | - |
| British Columbia | 19.3 | - |
| Ontario | 109.2 | 151.0 |
| Nunavut | 164.6 | 164.6 |
| Northwest Territories | 215.5 | 215.5 |

The incremental cost of fuel and utilities in road connected remote communities ranges from zero in Quebec and Newfoundland to 215.5 percent in Northwest Territories. Note that the cost of fuel and utilities has to be at least 15 percent higher in a remote community compared to the nearest point of comparison city to be included in the list. The incremental cost in fly-in communities ranges from 55.8 percent in Quebec to 215.5 percent in Northwest Territories.

6.0 Applying Cost Factors to Remote and Isolated Schools in Ontario

This part of the report attempts to apply the cost factors calculated above to a sample of First Nation Schools in Ontario. We have selected 7 remote fly-in schools and five remote with all-weather road schools. Table 13 shows the number of full-time equivalent students in each of the selected schools.

Table 13: Selected First Nation Schools

| Operating First Nation Number | Operating First Nation Name | Access | No. of FTE Pupil |
|-------------------------------|-----------------------------|-------------|------------------|
| 143 | Attawapiskat | fly-in | 505.5 |
| 208 | Pikangikum | fly-in | 809.5 |
| 239 | Neskantaga | fly-in | 45 |
| 211 | Sandy Lake | fly-in | 630 |
| 240 | Webique | fly-in | 214 |
| 238 | North Spirit | fly-in | 68 |
| 243 | Kashechewan | fly-in | 623 |
| 205 | Lac Seul | Road Access | 225 |
| 182 | Constance Lake | Road Access | 200.5 |
| 131 | Onigaming | Road Access | 94 |
| 226 | Mattagami | Road Access | 27 |
| 203 | Mishkeegogamang | Road Access | 196 |

All cost indicators identified in this report are applicable to First Nation schools. However, we can apply them to only three categories of funding due to the lack of specific data on various expenditure categories for each school. The categories are:

1. Special Purpose Grant
2. Transportation
3. School operation and maintenance

6.1. The Special Purpose Grant

The Special Purpose Grant provides additional funding for students who need special education programs, services and/or equipment. For Ontario school boards, this grant is made up of six allocations which may only be used for special education. Manitoba has a similar grant for students with special needs. It is called “Student Support Services”. FRAME defines this grant as consisting of “costs specifically related to students who have exceptional learning needs, as well as counselling and guidance and resource costs for all students.

Students with exceptional learning needs are students who have physical, cognitive, sensory or emotional/behavioral disabilities. Costs include special education and resource teachers, special needs educational assistants, counsellors, clinicians, and related and appropriate services (e.g. occupational therapists), supplies, textbooks, materials, equipment, and software. Special education coordinators or student services administrators and clerical staff are also included.

6.2. Transportation Grant

According to the Ontario Education Funding Technical Report 2018-2019 (page 89), student transportation grant “provides school boards with funding to transport students to and from home and school, including transporting students with special needs.” The Student Transportation Grant consists of a base amount from the prior year’s allocation and adjusted by the following five amounts:

- Enrolment Adjustment Amount
- Cost Update Adjustment Amount
- School Bus Rider Safety Training Amount
- Funding for Transportation to Provincial or Demonstration Schools Amount
- As well as a mechanism to adjust for Fuel Escalation and De-escalation.

The comparability model has applied a cost increase of 2% for providing transportation services for boards with a transportation deficit.

6.3. School Facility Operation & Maintenance

According to the Ontario Education Funding Technical Report 2018-2019 (page 110), “The School Facility Operations and Renewal Grant addresses the costs of operating school facilities (heating, lighting, maintaining, and cleaning) as well as the costs of repairing and renovating schools.”

The grant has the following two major allocations:

- School Operations Allocation.
- School Renewal Allocation

The school operation and maintenance allocation consists of the following six components:

- Enrolment
- On the ground capacity
- Benchmark area per pupil
- Supplementary area factor
- Benchmark for renewal costs
- Geographic adjustment factor

School renewal allocation has not been included in the comparability model as that allocation deals with minor and major capital that is excluded from the model. As not all data has been available, the comparability model applies a rate per square metre to the size of each First Nations school based on the average per square metre rate allocated to school boards in a similar region to the FNEA.

We note that another category, namely remote and rural allocation grant, supports the additional costs of purchasing goods and services for small school boards, boards that are distant from major urban centers and boards that are distant from other school boards. Therefore, the shipping cost differential could be applied to this grant if the base amount was available. Other cost factors such as information technology services could have been applied if the financial data on expenditures on such items were available.

6.4. Per Pupil Illustrative Calculations

Based on the information contained in the comparability report, Table 14 shows per pupil amount of the above three categories of funding for the selected schools. The last two rows show average per pupil and the provincial average per pupil amounts in Manitoba.

Table 14: Financing Northern & Remote Schools

| Operating First Nation Name | Access | FTE STUDENTS | Transportation (\$) | Special Purpose Grant (\$) | School Operation & Maintenance (\$) |
|---------------------------------|-------------|--------------|---------------------|----------------------------|-------------------------------------|
| Attawapiskat | fly-in | 505.5 | 246.9 | 2,586.0 | 1,564.4 |
| Pikangikum | fly-in | 809.5 | 235.5 | 3,476.7 | 415.9 |
| Neskantaga | fly-in | 45.0 | 2,014.6 | 3,476.7 | 2,678.6 |
| Sandy Lake | fly-in | 630.0 | 586.0 | 82.8 | 1,004.5 |
| Webique | fly-in | 214.0 | 537.9 | 3,476.7 | 976.1 |
| North Spirit | fly-in | 68.0 | 2,491.7 | 3,500.3 | 1,863.2 |
| Kashechewan | fly-in | 623.0 | 238.0 | 2,081.5 | 721.3 |
| Lac Seul | Road Access | 225.0 | 1,134.0 | 1,695.7 | 1,160.2 |
| Constance Lake | Road Access | 200.5 | 707.9 | 2,628.3 | 1,671.2 |
| Onigaming | Road Access | 94.0 | 1,223.3 | 3,207.4 | 2,011.3 |
| Mattagami | Road Access | 27.0 | 1,223.3 | 2,994.1 | 2,201.8 |
| Mishkeegogamang | Road Access | 196.0 | 748.1 | 3,500.3 | 1,014.2 |
| Frontier School Division | | | 1,879.0 | 3,520.0 | 3,791.0 |
| Manitoba Average | | | 582.0 | 2,465.0 | 1,530.0 |

Assuming that cost factors in FSD are good representatives of Ontario's northern and remote communities and represent per pupil amounts required to finance remote schools adequately, Table 15 shows that the transportation budgets for larger schools in Northern Ontario are significantly below FSD's average.

It appears that the current practice adversely impacts larger schools. Similarly, per pupil amounts allocated to special purpose grant are consistently below the amount required to adequately finance schools. Similarly, school operation and maintenance budget are significantly below the amounts necessary to properly finance operation and maintenance.

We note that the comparability report calculates school operation and maintenance amount based on the square footage of schools. The Ontario comparability model indicates that the average O&M cost per square metre in Ontario equals \$83.87. On the other hand, as we saw above, the average O&M cost per square metre in FSD equals \$126.15.¹³ It appears that the comparability report very significantly underestimates O&M cost for remote and isolated schools.

Table 15 estimates the amount of underfunding of the above three categories assuming that the averages in FSD represents the necessary amount.

Table 15: estimates of Potential Underfunding of Northern Schools

| Operating First Nation Name | Access | Transportation (\$) | Special Purpose Grant (\$) | School Operation & Maintenance (\$) |
|-----------------------------|-------------|---------------------|----------------------------|-------------------------------------|
| Attawapiskat | fly-in | 825,051.8 | 472,127.5 | 1,125,539.2 |
| Pikangikum | fly-in | 1,330,438.1 | 35,065.8 | 2,732,135.6 |
| Neskantaga | fly-in | - | 1,949.3 | 50,059.4 |
| Sandy Lake | fly-in | 814,590.1 | 2,165,449.8 | 1,755,501.1 |
| Webique | fly-in | 286,985.2 | 9,270.9 | 602,398.3 |
| North Spirit | fly-in | - | 1,340.0 | 131,089.0 |
| Kashechewan | fly-in | 1,022,360.4 | 896,157.5 | 1,912,453.6 |
| Lac Seul | Road Access | 167,616.0 | 410,468.0 | 591,930.5 |
| Constant Lake | Road Access | 234,799.2 | 178,790.5 | 425,012.3 |
| Onigaming | Road Access | 61,636.6 | 29,387.0 | 167,295.2 |
| Mattagami | Road Access | 17,704.1 | 14,198.1 | 42,907.3 |
| Mishkeegogamang | Road Access | 221,659.9 | 3,862.4 | 544,261.8 |

7.0 Methodological Approach to Estimating a Non-Salary Composite Cost Factor for Remote and Isolated Schools

The approach taken to determine the methodology for calculation of the non-salary remoteness increment for remote and isolated communities is set out in detail below. Essentially, the approach was based on the following:

- Accept the national average split in education systems expenditures between salary (salaries, benefits, staff travel, recruitment etc.) and non-salary cost drivers of 70% Salary and 30% Non-Salary.

¹³ Note 1 square metre equals 10.76639 square feet. Note, the definition of O&M cost used in the Comparability model appears to be narrower than the one used in FRAME.

- For the 30%, develop expenditure categories for those non-salary goods and services that are impacted by remoteness.
- Assess by expenditure category the methodology to calculate the incremental cost percentage of goods and services.
- Apply these incremental cost percentages to each of the expenditure categories on a community by community basis.
- Using the percentage shares of each category and their incremental cost, estimate an overall composite cost factor for each region.

While the actual costs within each expenditure category will change over time and such changes reflected in the both the Isolated Post Directive and more generally the Statistics Canada cost of living analysis, the methodology for calculating the impact of cost increases for remote and isolated communities can remain constant.

7.1. Estimating Incremental Cost factors for Remote and Isolated Communities

To estimate cost factor multipliers applicable to the 30 percent of the operating expenditures (non-salary components) in remote and isolated communities, two sets of information was required:

1. The share of each of the non-salary expenditure categories in the total operating expenditures of remote schools.
2. The incremental cost of each expenditure category relative to non-remote schools.

Securing this information was the fundamental purpose of the planned Survey of First Nation education systems.

As mentioned above, FSD is used as a proxy to calculate the incremental costs incurred by remote and isolated communities in delivering the same level and quality of education as their non-isolated counterparts. For the present exercise, based on FSD, we have used the following four expenditure categories to represent the non-salary components or the so-called 30 percent.

Table 16: Non-Salary Components as a Share of Total Operating Budget

| Non-Salary Expenditure Categories | Shares (%) | Relative Cost (%) | Unit of Measurement |
|-----------------------------------|------------|-------------------|---------------------|
| Professional Development | 0.7 | 111.0 | Per pupil cost |
| Supplies | 3.8 | Varies by Region | Ave. shipping cost |
| O&M | 16.9 | Varies by Region | Per SQ. FT. cost |
| Transportation | 8.7 | 195.1 | Per Km cost |

To estimate cost factors for fly-in and all-weather road remote communities, the above shares and relative cost factors were used, and the following four assumptions made:

1. The differential cost of supplies is directly related to the differential cost of shipping to various remote communities from the point of comparisons determined by ISC.
2. The differential cost of O&M is directly related to the differential cost of fuel and utilities estimated by the government of Canada for various Isolated Posts.
3. Transportation cost per kilometre in remote schools is similar to the cost per kilometre in FSD (\$4.82/km) compared to the average cost per kilometer in all school divisions in Manitoba (\$2.47/km).
4. Professional & staff development cost per pupil in remote schools, is similar to the per pupil cost in FSD (\$141 per pupil) compared to the provincial average of \$127 per pupil.

7.2. Estimated Cost Factors

Based on the above assumptions, Table 17 shows the composite cost multiplier that can be applied to the non-salary share of the operating expenditures in remote and isolated schools in various regions of Canada.

Table 17: Cost Factors for Non-Salary Components in Remote and Isolated Schools

| Region | Road Connected Remote Communities | Fly-in Communities |
|-----------------------|--|---------------------------|
| Yukon Territory | 200.6 | 321.3 |
| Alberta | 184.0 | 249.5 |
| Quebec | 106.2 | 178.8 |
| Manitoba | 140.6 | 191.9 |
| Saskatchewan | 195.5 | 303.7 |
| Newfoundland | 101.8 | 155.1 |
| British Columbia | 129.7 | 146.6 |
| Ontario | 207.0 | 256.1 |
| Nunavut | 268.2 | 268.2 |
| Northwest Territories | 298.0 | 317.3 |
| Average | 183.2 | 238.8 |

The average cost of fuel and utilities in all-weather road and fly-in communities are 184.59 and 229.76 respectively. Moreover, the correlation coefficients between the cost factors in fly-in and all-weather communities and the cost of fuel and utilities in those communities equal 0.99 that suggests a perfect correlation between these factors.

Given that perfect correlation implies a coefficient of one, the above estimated correlation coefficients suggest that one can conservatively use the differential cost of fuel and utilities as calculated by the government of Canada to adjust the total 30 percent non-salary expenditures until the detailed information on various categories of expenditures in different provinces is available.

7.3 Estimating Percentage Incremental Costs for Remote Communities

We have estimated models that generate an approximate cost factors for communities for which data is not available. The estimates are based on the community's straight line distance in km (Distance) from their nearest point of comparison city. It is important to note that the models can only be used to estimate various cost factors for remote communities that can be classified as isolated based on the NJC criteria. Results are presented in Appendix "D".

8.0 Conclusions & Recommendations

This report set out a methodology that can be applied for the calculation of the non-salary portion of the incremental costs associated with the delivery of education programs and services in Canada's remote and isolated communities. The report was constrained by lack of specific expenditure data from First Nations education systems – both remote and road access.

It is clear from our research that many, if not most, remote and isolated First Nations are currently underfunded in comparison to their provincial counterparts. Such underfunding is likely to have more impact on the quality of education programs and services than on non-salary components. In other words, shortfalls in the non-salary portion of education funding, are resourced by moving funds from the salary portion. The reason for this is that the majority of costs in the non-salary component are not discretionary. The full costs of fuel, utilities, maintenance etc., must be paid regardless of impact on budget. First Nations then must cover these costs by reducing expenditures on things like teacher salaries, staff complement, and special education services.

Moving forward with refinement of the First Nation funding regime, additional work supported by requisite data will be required. Ensuring funding is available to enable First Nation education systems to deliver programs and services that result in achievement levels that meet or exceed provincial achievement standards in a culturally relevant manner, should be a mutual goal of First Nations and the Government of Canada.

Recommendation #1

That the community specific differential cost of Fuel and Utilities as calculated by the Government of Canada in the Isolated Post Directive be used by ISC to adjust the total 30 percent non-salary expenditures in the Ontario Regional Interim Formula for remote and isolated communities until the detailed information on various categories of expenditures in different provinces is available.

Recommendation #2

That AFN & ISC cooperatively develop First Nations education financing data requirements such that accurate allocations can be made for every First Nation regardless of size or circumstance.

Recommendation #3

That remote and isolated First Nations have the option of calculating their remoteness factor for purposes of education funding either through comparability to the provincial funding regime or to the methodology adapted from application of the Isolated Post Directive.

Appendix “A” Community Remoteness Cost Survey



Remote Communities Cost Survey

Welcome to the Survey! This survey is part of the ongoing joint process between the Assembly of First Nations (AFN) and Indigenous Services Canada (ISC) with respect to Transformation of First Nation Education Funding. AFN is conducting this research survey to collect information that is critical to our negotiations to ensure that all First Nations have the funding required to provide education programs and services that meet the needs of their students regardless of community size, geographic location or economic circumstances.

Gathering this information from all First Nations will help us learn more about funding levels and shortfalls in First Nation education funding. It will also enable us to determine the incremental costs incurred by Remote and Isolated First Nations and to develop a methodology to ensure that their education programs and services are appropriately funded.

The survey is being carried out on behalf of AFN by Moazzami Economic Consultants Inc. and Chignecto Consulting Group. Information made available to the consultants will not be made available to either AFN or ISC on a community by community basis. The results will be aggregated nationally and by regions, only where such aggregation will not reveal individual community results.

The information being collected will provide the consultants with data that will be used in the development of a specific funding allocation methodology. The completed study is due from the consultants by the end of fiscal year so it is critical that your input is received by February 28, 2019 (earlier if at all possible!).

The consultants are available to answer any questions you may have. Please email any suggestions, concerns or questions to: *Education.Transformation.Survey@gmail.com*

Thank you very much for taking time to complete this survey and for contributing to the future success of First Nation education systems by helping us to ensure that appropriate and adequate resources are provided to every First Nation community education system.

1. Please Provide the Following Contact Information

Name and Address of Contact Person

First Nation

2. What is the total On-Reserve Population in your Community?
3. What is your 2018-2019 On-Reserve Elementary School Enrolment?
4. What grades are taught in your On-Reserve Elementary School?
5. What is your 2018-2019 On-Reserve Secondary School Enrolment?
6. What grades are taught in your On-Reserve Secondary School?
7. What is your 2018-2019 Off-Reserve Elementary School Enrolment? Please only Include Students for whom the First Nation has financial responsibility.
8. What is your 2018-2019 Off-Reserve Secondary School Enrolment? Please only Include Students for whom the First Nation has financial responsibility.
10. What grades do students for whom the First Nation has financial responsibility attend off-reserve provincial or private schools?
11. How many students for whom the First Nation has financial responsibility are in private home placement, boarding homes or residential schools?
12. What is the average monthly per student charge for private home placement, boardings and residential school boarding?
13. What is the name of the nearest community to you with a population of 15,000 or more?
14. What is the distance in kilometres of your Community from the nearest Community of 15,000 or more.
15. Please indicate the appropriate Region in which your First Nation is located. This is required to enable us to sort national results by region.
16. Please select from the following the choice that most accurately represents your community access:

All Weather Road - Paved

- All Weather Road - Gravel & Paved Winter Road Only.
 Sea/Lake Access Only Fly-In Access Only

17. How are the majority of your goods and services transported?

- All Weather Road - Paved
 All Weather Road - Gravel & Paved
 Winter Road
 Other (please specify)
 Sea/Lake Fly-In

18. With respect to the location from which the majority of your goods and services are shipped to the community:

What is your normal freight transportation service centre?

What distance is it from the community?

What is the cost per pound (\$/lb) for freight to your community from this service centre?

19. What is the annual estimated freight expenditures for supplies and equipment for the education program annually?

20. What was your total Education Budget for the 2017-2018 On-Reserve Elementary and Secondary Education Programs?

Note: Please include O&M costs including those that may have been provided by the First Nation O&M program for the school?

21. What was the total amount of funding expended in 2017-2018 on Staff Salary, Benefits and Teacher Travel (based on 2 Return Trips)?

22. What year was the main school building built?

23. On a scale of 1-5, with 1 being the lowest score, how would rate the physical condition of the school building(s)?

24. What is the square footage of the school, teacherages and any ancillary buildings?

25. What is the average cost of diesel fuel per litre in your community?

26. Is school electricity generated by diesel generator or by hydro grid line?

27. What is the annual heating fuel expenditure for the school, teacherages and ancillary buildings?
28. What is the annual electricity costs for the school, teacherages and ancillary buildings?
29. What is the annual janitorial staff salary including casual staff?
30. What are the annual janitorial supplies expenditures?
31. What is the annual estimated expenditures on fees for external technicians and tradespersons being brought into the community?
32. What is the annual estimated expenditures on travel for external technicians and tradespersons being brought into the community?
33. What is the average number of days that external technicians and tradespersons being brought into the community charge for? Include travel days.
34. What is the number of professional staff in the school? (Principals, Teachers, Guidance Counsellors)
35. How many of the professional staff are not permanent residents of the community?
36. What is the number of support staff in the school? Include teacher aides, tutor escorts etc.?
37. How many of the support staff are not permanent residents of the community?
38. What is the average daily fee charge for education consultants coming into your community? Note: Exclude travel charges.
39. Are you aware if education consultants coming to your community charge higher fees per day than they do in urban centres? If so, what is the estimated percentage increase?
40. What is the average number of days per visit that education consultants coming to your community stay?
41. What is the estimated annual expenditure for travel costs for external consultants and supervisory personnel?
42. What are your annual estimated staff travel costs related to Professional Development? Please include only the costs of staff leaving the community to attend Professional Development sessions.
43. If you have a food services program - breakfast, lunch, snacks - what is the annual budget for these services including staff and supplies?

44. If you have a food services program, (breakfast, lunch, snacks), please answer the following:

What food services do you provide?

What is the cost for food/drink supplies?

What is food services salary budget?

Are there other costs? If so please specify.

45. What is your annual cost for Internet and related services? If you also know your per gigabit cost please include it as well.

46. If you know, what is the estimated percentage incremental costs you pay per gigabit for Internet and related services including on-site repair and maintenance compared to the nearest community of 15,000 or more?

47. Please provide the following with respect to School Transportation Expenditures:

Total Annual Salary budget related to School Transportation

Annual Cost of vehicle maintenance and repair

Fuel costs related to School Transportation

What is the average price per litre for vehicle fuel in your community?

What is the total distance travelled daily for school transportation?

How many school buses do you have?

How many school vans do you have?

On average, how many students are transported daily?

48. Please summarize your overall education budget using the following categories for *on-reserve education*. This information is critical!

Total On Reserve Education Budget

Education Staff Salaries & Benefits

Education Staff Travel

Freight costs for materials and supplies

Annual total fuel, electricity and hydro expenditures

Annual Janitorial Staff Budget

Annual Maintenance and Supply Budget

Annual External Second Level Services - Consultants, Specialists, Supervisory

Community School Transportation Budget

Food Services

Internet & Related Services

Other

49. Off-reserve (Provincial & Private) Expenditures

Annual Provincial or Private School Education Tuition Expenditures

Student Transportation to Provincial/Private Schools (including emergency trips home) Expenditures

Costs for First Nation Counselling Services for on-reserve students attending Provincial or Private Schools

Cost of Allowances and School Supplies for on-reserve students attending Provincial or Private Schools

Do you have a tuition agreement in place with the Provincial and/or private schools students attend?

50. Please enter any comments, suggestions or concerns about funding levels, programs and services or this survey.

Appendix “B” Ontario Salary Component Calculation Methodology

The following is an excerpt from the Ontario Interim Funding Model Narrative Overview. The notes in italics are to provide an example of the approach.

The Ontario Technical Table for the Interim Funding Approach (OTTIFA) put forward these adaptations after much discussion. OTTIFA plans to continue to work on the issue of remoteness and comparability and to further refine the approach.

The examples are used for illustrative purposes only. It doesn't use actual community/funding data except for data that is publically available (i.e. the IPA rates).

Remoteness Adaptations (outside of Model Comparability)

The GSN is designed to fund schools in Ontario wherever provincial schools exist. The various grants and components adjust for geographic, socio-economic and local factors. The GSN is thus suited to deal with some level of remoteness for provincial schools.

However, some First Nation schools and communities fall outside of the GSN comparability by being without road access (or “fly-in”). The Interim Funding Model has been adapted to deal with this extreme level of remoteness for those communities. Each identified community is paired with its Isolated Post Allowance amounts (or its closest/most similar counterpart in the IPA).

Explanation:

Determine which communities fall outside of the provincial comparability in terms of remoteness.

The Remoteness Adaptations are divided into four parts:

Part 1 - Adapting employee salaries for the cost of living in a remote area

By using the Federal Government's Isolated Post Allowance average amounts for Environment, Living Cost and Fuel & Utilities and the GSN estimated average teacher salary, an adjustment factor for each community is determined. This factor is then applied against 70% of the GSN amounts generated by the Interim Funding Model (the portion which can be considered as salary-related). The resulting amount is the first part of the remoteness adaptations addressing the remote cost of living.

<https://www.njc-cnm.gc.ca/directive/d4/v237/s624/en#s624-tc-tm>

Explanation:

At the above URL, use the information found in Appendix A, B, C and D for the identified communities.

| | Environment Allowance | Living Cost Differential | Fuel & Utilities Differential | Average Environment Allowance | Average Living Cost Differential | Average F & U Differential | Total Average |
|------------------|-----------------------|--------------------------|-------------------------------|-------------------------------|----------------------------------|----------------------------|---------------|
| First Nation "X" | 4 | 9 | 30 | 6,506.50 | 14,061.00 | 5,900.00 | 26,467.50 |

- Ontario Average Teacher Salary (as per the GSN): 84,166
- $26,467 / 84,166 = \text{adjustment on salary for the community} = 31\%$
- In the Grant for Student Needs (GSN) in Ontario, 70% of the total funding is deemed to be salary-related; therefore the adjustment of 31% is applied against that portion of the total formula-generated amount for the community.
- Total formula-generated amount - 1,000,000
- Salary-related portion – 700,000
- Adaptation on Salaries – $700,000 \times 31\% = \underline{217,000}$

Part 2 - Adapting operations and maintenance costs for the cost of operating a school in a remote area

By using the Indigenous Services Canada's Cost Differential analysis, an adjustment factor for each community is determined. This factor is then applied against the Model amount for the School Facility Operations grant (3.3.12.a). The resulting amount is the second part of the remoteness adaptations addressing operations and maintenance.

Explanation

- From the above analysis, the cost differential determined for Community Y is 128%.
- Based on the proximate school board rate and the education facility floor space (Sq M), the model generated 100,000 for the School Facility Operations component for the community.
- Adaptation on O&M – $100,000 \times 128\% = \underline{128,000}$

Part 3 - Providing travel amounts for out-of-community staff

- By using the Federal Government's Vacation Travel Assistance, a travel rate and frequency is determined for each community.
- This amount is applied to 80% of the school's staff (this is the portion of the staff estimated to be from outside of the remote community).
- The resulting amount is the third part of the remoteness adaptations addressing travel costs of the out-of-community staff.

<https://www.canada.ca/en/treasury-board-secretariat/services/terms-conditions-employment/isolated-posts-government-housing/vacation-travel-assistance-effective-april-1-2018.html>

Part 4 - Private Home Placement and Student Accommodations.

This calculation uses the Vacation Travel Assistance rates and approach and applies it to students. It's not included in this example. The rates, factors and proportions are community and/or province-specific.

Appendix “C” OLS Estimation of Average Provincial Cost Factors

Table C.1: Percentage Incremental Cost of Living in Remote Communities

| Region | Slope Coefficients | T-Statistics | Provincial Dummy Variables | T-Statistics |
|-----------------------|---------------------------|---------------------|-----------------------------------|---------------------|
| Yukon Territory | 42.72 | 10.30 | 65.28 | 4.07 |
| Alberta | 32.94 | 8.76 | 28.06 | 1.76 |
| Quebec | 23.83 | 3.76 | 39.94 | 4.89 |
| Manitoba | 34.50 | 10.90 | 34.12 | 6.82 |
| Saskatchewan | 35.66 | 12.38 | 40.34 | 2.56 |
| Newfoundland | 22.57 | 9.20 | 36.42 | 4.95 |
| British Columbia | 35.18 | 12.00 | 4.20 | 0.26 |
| Ontario | 37.45 | 8.01 | 44.25 | 7.84 |
| Nunavut | 98.37 | 32.95 | - | - |
| Northwest Territories | 79.58 | 17.77 | 23.88 | 3.67 |
| R2 | 0.94 | | | |
| R2 adjusted | 0.93 | | | |
| F(19,259) | 207.77 | | | |

Table C.2: Incremental Cost of Living in remote Communities

| Region | Slope Coefficients | T-Statistics | Provincial Dummy Variables | T-Statistics |
|-----------------------|---------------------------|---------------------|-----------------------------------|---------------------|
| Yukon Territory | 9,175.93 | 10.28 | 14,053.07 | 4.07 |
| Alberta | 7,101.65 | 8.77 | 6,098.35 | 1.77 |
| Quebec | 5,135.17 | 3.77 | 8,617.28 | 4.90 |
| Manitoba | 7,431.96 | 10.90 | 7,330.10 | 6.80 |
| Saskatchewan | 7,658.17 | 12.35 | 8,697.83 | 2.56 |
| Newfoundland | 4,836.87 | 9.16 | 7,807.72 | 4.93 |
| British Columbia | 7,575.93 | 12.02 | 912.92 | 0.27 |
| Ontario | 8,050.36 | 8.00 | 9,551.84 | 7.86 |
| Nunavut | 21,171.52 | 32.95 | - | - |
| Northwest Territories | 17,117.58 | 17.76 | 5,079.87 | 3.64 |
| R2 | 0.94 | | | |
| R2 adjusted | 0.93 | | | |
| F(19,259) | 207.53 | | | |

Table C.3: Percentage Incremental Cost of Shipping in Remote Communities

| Region | Slope Coefficients | T-Statistics | Provincial Dummy Variables | T-Statistics |
|-----------------------|---------------------------|---------------------|-----------------------------------|---------------------|
| Yukon Territory | 125.20 | 8.50 | 173.78 | 3.05 |
| Alberta | 50.76 | 3.80 | 172.23 | 3.04 |
| Quebec | 47.00 | 2.09 | 199.11 | 6.86 |
| Manitoba | 275.00 | 2.45 | 104.50 | 5.88 |
| Saskatchewan | 50.07 | 4.89 | 158.93 | 2.84 |
| Newfoundland | 12.10 | 1.39 | 171.90 | 6.58 |
| British Columbia | 103.35 | 9.93 | 133.64 | 2.38 |
| Ontario | 109.90 | 6.62 | 107.38 | 5.35 |
| Nunavut | 221.37 | 20.88 | - | - |
| Northwest Territories | 114.83 | 7.22 | 152.35 | 6.62 |
| R2 | 0.87 | | | |
| R2 adjusted | 0.86 | | | |
| F(19,259) | 94.28 | | | |

Table C.4: Percentage Incremental Cost of Fuel and Utilities in Remote Regions

| Region | Slope Coefficients | T-Statistics | Provincial Dummy Variables | T-Statistics |
|-----------------------|---------------------------|---------------------|-----------------------------------|---------------------|
| Yukon Territory | 99.38 | 7.01 | 116.12 | 2.11 |
| Alberta | 90.90 | 7.06 | 51.50 | 0.94 |
| Quebec | 0.62 | 0.03 | 55.78 | 1.99 |
| Manitoba | 43.39 | 4.00 | 44.74 | 2.61 |
| Saskatchewan | 104.53 | 10.60 | 103.67 | 1.92 |
| Newfoundland | 5.95 | 0.71 | 37.16 | 1.48 |
| British Columbia | 19.31 | 1.92 | 19.30 | 0.36 |
| Ontario | 109.22 | 6.82 | 41.75 | 2.16 |
| Nunavut | 164.63 | 16.12 | - | - |
| Northwest Territories | 215.50 | 14.06 | 1.31 | - |
| R2 | 0.82 | | | |
| R2 adjusted | 0.81 | | | |
| F(19,259) | 63.57 | | | |

Appendix “D” Estimating Incremental Costs For Remote Communities

The estimated models in this appendix allows one to calculate an approximate cost factors for communities for which data is not available. The estimates are based on the community’s straight line distance in km (Distance) from their nearest point of comparison city. It is important to note that the models can only be used to estimate various cost factors for remote communities that can be classified as isolated based on the NJC criteria. Results are presented in Appendix “D”.

1: Alberta

Communities with road access:

1.1: Percentage Incremental cost of living (ICL) compared to their nearest point of comparison city:

$$ICL = 26.66 + 0.0001857 * \text{Distance}$$

1.2: Amount of compensation in dollar for cost of living differential (COL) compared to the nearest point of comparison city:

$$COL = \$5754 + 3.9904 * \text{Distance}$$

1.3: Percentage incremental cost of shipping (COS) compared to their nearest point of comparison city:

$$COS = 43.75 + 0.0003925 * \text{Distance}$$

1.4: Percentage incremental cost of fuel and utilities (Fuel) compared to their nearest point of comparison city:

$$\text{Fuel} = 90.84 + 0.006904 * \text{Distance}$$

Example using Alberta model for communities with road access:

The percentage incremental costs for a remote all-weather road accessed community in Alberta that is 1000 km from the nearest point of comparison city (Edmonton) are calculated as follows:

$$\text{Incremental cost of living (\%)} = 26.66 + 1000 \times 0.0001857 = 26.66 + 0.1857 = 26.85\%$$

$$\text{Dollar Compensation (\$)} = \$5,754 + 1000 \times 3.9904 = \$5,754 + \$3,990.4 = \$9,744.4$$

$$\text{Incremental cost of shipping (\%)} = 43.75 + 1000 \times 0.0003925 = 43.75 + 0.3925 = 44.14\%$$

$$\text{Incremental cost of fuel and utilities (\%)} = 90.84 + 1000 \times 0.006904 = 90.84 + 6.904 = 97.74\%$$

2: British Columbia

Communities with road access:

2.1: Percentage Incremental cost of living (ICL) compared to their nearest point of comparison city:

$$\text{ICL} = 22.43 + 0.0001857 * \text{Distance}$$

2.2: Amount of compensation in dollar for cost of living differential (COL) compared to the nearest point of comparison city:

$$\text{COL} = \$4835.8 + 3.9904 * \text{Distance}$$

2.3: Percentage incremental cost of shipping (COS) compared to their nearest point of comparison city:

$$\text{COS} = 81.32 + 0.0003925 * \text{Distance}$$

2.4: Percentage incremental cost of fuel and utilities (Fuel) compared to their nearest point of comparison city:

$$\text{Fuel} = 13.96 + 0.006904 * \text{Distance}$$

3: Quebec

Communities with road access:

3.1: Percentage Incremental cost of living (ICL) compared to their nearest point of comparison city:

$$\text{ICL} = 11.45 + 0.0001857 * \text{Distance}$$

3.2: Amount of compensation in dollar for cost of living differential (COL) compared to the nearest point of comparison city:

$$\text{COL} = \$2,474.2 + 3.9904 * \text{Distance}$$

3.3: Percentage incremental cost of shipping (COS) compared to their nearest point of comparison city:

$$\text{COS} = 20.83 + 0.0003925 * \text{Distance}$$

3.4: Percentage incremental cost of fuel and utilities (Fuel) compared to their nearest point of comparison city:

$$\text{Fuel} = 0.006904 * \text{Distance}$$

Fly-in Communities:

3.5: Percentage Incremental cost of living (ICL) compared to their nearest point of comparison city:

$$\text{ICL} = 41.51 + 0.0001857 * \text{Distance}$$

3.6: Amount of compensation in dollar for cost of living differential (COL) compared to the nearest point of comparison city:

$$\text{COL} = \$8,968.8 + 3.9904 * \text{Distance}$$

3.7: Percentage incremental cost of shipping (COS) compared to their nearest point of comparison city:

$$\text{COS} = 178.23 + 0.0003925 * \text{Distance}$$

3.8: Percentage incremental cost of fuel and utilities (Fuel) compared to their nearest point of comparison city:

$$\text{Fuel} = 52.11 + 0.006904 * \text{Distance}$$

4: Manitoba

Communities with road access:

4.1: Percentage Incremental cost of living (ICL) compared to their nearest point of comparison city:

$$\text{ICL} = 25.36 + 0.0001857 * \text{Distance}$$

4.2: Amount of compensation in dollar for cost of living differential (COL) compared to the nearest point of comparison city:

$$\text{COL} = \$5,468.3 + 3.9904 * \text{Distance}$$

4.3: Percentage incremental cost of shipping (COS) compared to their nearest point of comparison city:

$$\text{COS} = 8.19 + 0.0003925 * \text{Distance}$$

4.4: Percentage incremental cost of fuel and utilities (Fuel) compared to their nearest point of comparison city:

$$\text{Fuel} = 39.99 + 0.006904 * \text{Distance}$$

Fly-in Communities:

4.5: Percentage Incremental cost of living (ICL) compared to their nearest point of comparison city:

$$\text{ICL} = 58.58 + 0.0001857 * \text{Distance}$$

4.6: Amount of compensation in dollar for cost of living differential (COL) compared to the nearest point of comparison city:

$$\text{COL} = \$12,605.2 + 3.9904 * \text{Distance}$$

4.7: Percentage incremental cost of shipping (COS) compared to their nearest point of comparison city:

$$\text{COS} = 102.60 + 0.0003925 * \text{Distance}$$

4.8: Percentage incremental cost of fuel and utilities (Fuel) compared to their nearest point of comparison city:

$$\text{Fuel} = 84.39 + 0.006904 * \text{Distance}$$

5: Saskatchewan

Communities with road access:

5.1: Percentage Incremental cost of living (ICL) compared to their nearest point of comparison city:

$$\text{ICL} = 29.53 + 0.0001857 * \text{Distance}$$

5.2: Amount of compensation in dollar for cost of living differential (COL) compared to the nearest point of comparison city:

$$\text{COL} = \$6342.9 + 3.9904 * \text{Distance}$$

5.3: Percentage incremental cost of shipping (COS) compared to their nearest point of comparison city:

$$\text{COS} = 39.58 + 0.0003925 * \text{Distance}$$

5.4: Percentage incremental cost of fuel and utilities (Fuel) compared to their nearest point of comparison city:

$$\text{Fuel} = 105.2 + 0.006904 * \text{Distance}$$

6: Newfoundland

Communities with road access:

6.1: Percentage Incremental cost of living (ICL) compared to their nearest point of comparison city:

$$\text{ICL} = 13.98 + 0.0001857 * \text{Distance}$$

6.2: Amount of compensation in dollar for cost of living differential (COL) compared to the nearest point of comparison city:

$$\text{COL} = \$2,991.0 + 3.9904 * \text{Distance}$$

6.3: Percentage incremental cost of shipping (COS) compared to their nearest point of comparison city:

$$\text{COS} = 0.0003925 * \text{Distance}$$

6.4: Percentage incremental cost of fuel and utilities (Fuel) compared to their nearest point of comparison city:

$$\text{Fuel} = 2.76 + 0.006904 * \text{Distance}$$

Fly-in Communities:

6.5: Percentage Incremental cost of living (ICL) compared to their nearest point of comparison city:

$$\text{ICL} = 40.38 + 0.0001857 * \text{Distance}$$

6.6: Amount of compensation in dollar for cost of living differential (COL) compared to the nearest point of comparison city:

$$\text{COL} = \$8,645.4 + 3.9904 * \text{Distance}$$

6.7: Percentage incremental cost of shipping (COS) compared to their nearest point of comparison city:

$$\text{COS} = 150.7 + 0.0003925 * \text{Distance}$$

6.8: Percentage incremental cost of fuel and utilities (Fuel) compared to their nearest point of comparison city:

$$\text{Fuel} = 36.16 + 0.006904 * \text{Distance}$$

7: Ontario

Communities with road access:

7.1: Percentage Incremental cost of living (ICL) compared to their nearest point of comparison city:

$$\text{ICL} = 26.57 + 0.0001857 * \text{Distance}$$

7.2: Amount of compensation in dollar for cost of living differential (COL) compared to the nearest point of comparison city:

$$\text{COL} = \$5712.7 + 3.9904 * \text{Distance}$$

7.3: Percentage incremental cost of shipping (COS) compared to their nearest point of comparison city:

$$\text{COS} = 86.92 + 0.0003925 * \text{Distance}$$

7.4: Percentage incremental cost of fuel and utilities (Fuel) compared to their nearest point of comparison city:

$$\text{Fuel} = 105.17 + 0.006904 * \text{Distance}$$

Fly-in Communities:

7.5: Percentage Incremental cost of living (ICL) compared to their nearest point of comparison city:

$$\text{ICL} = 71.13 + 0.0001857 * \text{Distance}$$

7.6: Amount of compensation in dollar for cost of living differential (COL) compared to the nearest point of comparison city:

$$\text{COL} = \$15,328.3 + 3.9904 * \text{Distance}$$

7.7: Percentage incremental cost of shipping (COS) compared to their nearest point of comparison city:

$$\text{COS} = 194.92 + 0.0003925 * \text{Distance}$$

7.8: Percentage incremental cost of fuel and utilities (Fuel) compared to their nearest point of comparison city:

$$\text{Fuel} = 147.03 + 0.006904 * \text{Distance}$$

8: Nunavut

Fly-in Communities:

8.1: Percentage Incremental cost of living (ICL) compared to their nearest point of comparison city:

$$\text{ICL} = 59.76 + 0.0001857 * \text{Distance}$$

8.2: Amount of compensation in dollar for cost of living differential (COL) compared to the nearest point of comparison city:

$$\text{COL} = \$12,874.64 + 3.9904 * \text{Distance}$$

8.3: Percentage incremental cost of shipping (COS) compared to their nearest point of comparison city:

$$\text{COS} = 139.77 + 0.0003925 * \text{Distance}$$

8.4: Percentage incremental cost of fuel and utilities (Fuel) compared to their nearest point of comparison city:

$$\text{Fuel} = 150.28 + 0.006904 * \text{Distance}$$

9: Yukon Territories

Communities with road access:

9.1: Percentage Incremental cost of living (ICL) compared to their nearest point of comparison city:

$$\text{ICL} = 17.17 + 0.0001857 * \text{Distance}$$

9.2: Amount of compensation in dollar for cost of living differential (COL) compared to the nearest point of comparison city:

$$\text{COL} = \$3,688.7 + 3.99 * \text{Distance}$$

9.3: Percentage incremental cost of shipping (COS) compared to their nearest point of comparison city:

$$\text{COS} = 73.62 + 0.0003925 * \text{Distance}$$

9.4: Percentage incremental cost of fuel and utilities (Fuel) compared to their nearest point of comparison city:

$$\text{Fuel} = 96.01 + 0.006904 * \text{Distance}$$

10: Northwest Territories

Communities with road access:

10.1: Percentage Incremental cost of living (ICL) compared to their nearest point of comparison city:

$$\text{ICL} = 56.5 + 0.0001857 * \text{Distance}$$

10.2: Amount of compensation in dollar for cost of living differential (COL) compared to the nearest point of comparison city:

$$\text{COL} = \$12,154.1 + 3.9904 * \text{Distance}$$

10.3: Percentage incremental cost of shipping (COS) compared to their nearest point of comparison city:

$$\text{COS} = 66.02 + 0.0003925 * \text{Distance}$$

10.4: Percentage incremental cost of fuel and utilities (Fuel) compared to their nearest point of comparison city:

$$\text{Fuel} = 206.91 + 0.006904 * \text{Distance}$$

Fly-in Communities:

10.5: Percentage Incremental cost of living (ICL) compared to their nearest point of comparison city:

$$\text{ICL} = 75.0 + 0.0001857 * \text{Distance}$$

10.6: Amount of compensation in dollar for cost of living differential (COL) compared to the nearest point of comparison city:

$$\text{COL} = \$16,104.4 + 3.9904 * \text{Distance}$$

10.7: Percentage incremental cost of shipping (COS) compared to their nearest point of comparison city:

$$\text{COS} = 207.21 + 0.0003925 * \text{Distance}$$

10.8: Percentage incremental cost of fuel and utilities (Fuel) compared to their nearest point of comparison city:

$$\text{Fuel} = 201.91 + 0.006904 * \text{Distance}$$