



Keeyask Generation Project Socio-Economic Monitoring Plan

Socio-Economic Monitoring Report

SEMP-2016-01



KEEYASK GENERATION PROJECT

SOCIO-ECONOMIC MONITORING PLAN

REPORT #SEMP-2016-01

SOCIO-ECONOMIC MONITORING REPORT

JANUARY 2015 TO MARCH 2016:

YEAR TWO CONSTRUCTION

Prepared by

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SUMMARY

Socio-economic monitoring for the Keeyask Generation Project looks at the effects the Project has on key components of the socio-economic environment. Socio-economic components included in the Socio-Economic Monitoring Plan include employment and training opportunities; business opportunities; income; population; housing; infrastructure and services; transportation infrastructure; public safety and worker interaction; travel, access and safety; culture and spirituality; and mercury and human health.

Key learnings of the 2015/2016 Socio-Economic Monitoring Program included the following:

Employment:

- Since the start of construction to the end of March, 2016 the Project generated 2158 person years of employment in terms of a 2000 hour per year basis (1439 person years of employment in terms of a 3000 hour per year basis). Of this, 1714 represented Manitoba person years, and 766 represented total northern Manitoba (Aboriginal and non-Aboriginal) person years (44% of total Manitoba person years).



First Concrete for the Service Bay- September 26, 2015

- Since the start of construction to the end of March 2016 there were 4276 hires on the Project. Total Manitoba hires represented 3411 hires. Of this, 1721 hires represented northern Manitoba (Aboriginal and non-Aboriginal) hires (50% of total Manitoba hires).
- Since the start of construction to the end of March 31, 2016, total labour income earned was approximately \$193.9 million. Of this, northern Manitoba labour income represented \$48.6 million (25% of total labour income).
- Since the start of construction to the end of March 31, 2016, there have been 1108 occurrences where employees were discharged (223 occurrences) or resigned (885 occurrences). This represents a rate of turnover of 26.4% of total hires. The rate of turnover among the Manitoba and northern Manitoba segment of the labour force was 29.4% and 38.4% respectively. There have been 160 instances where individuals have been discharged or resigned, but later returned to work on the Project (i.e., they were rehired). This represents approximately 14 percent of the total discharges and resignations.
- In fall 2015, the Keeyask Advisory Group on Employment (AGE) established a sub-committee on training and employment.

Business Opportunities:

- \$1,274.2 million was spent on goods and services for the Project. Of this, \$514.2 million were Manitoba purchases. Total northern Manitoba (Aboriginal and non-Aboriginal) purchases represent \$310.9 million or 60% percent of total Manitoba purchases.
- Total labour income earned to end of March 31, 2016 is approximately \$193.9 million.

Population:

- Prior to construction (2003–2014), population changed at an annual average growth rate of 1.5% for Tataskweyak Cree Nation (TCN), 1.1% for War Lake First Nation (WLFN), -0.9% for York Factory First Nation (YFFN) and -0.9% for Fox Lake Cree Nation (FLCN). Following the start of construction from 2014–2015, population changed at an annual average growth rate of 2.1% for TCN, -5.8% for WLFN, 3.7% for YFFN and 2.3% for FLCN.
- For the Town of Gillam prior to construction (2008–2014), population changed at an annual average growth rate of 2.3%. Following the start of construction (2014–2015), population changed at an annual average growth rate of -2.5%.

Transportation Infrastructure:

- For this reporting period, traffic volume information for Provincial Roads 280 and 290 has been collected on a biennial basis, and includes estimates of annual average daily traffic, which is the number of vehicles passing a point on an average day of the year.
- All authorized vehicles entering and exiting the Keeyask North Access Road is recorded and reported annually.



Traffic volume of the the Keeyask North Access Road is recorded

Public Safety and Worker Interaction:

- In the period from January 1, 2015 to March 31, 2016, the Worker Interaction Subcommittee met three times.

Culture and Spirituality:

- Measures were in effect during the reporting period to support the retention of northern and Aboriginal employees at the job site and to ensure that sensitivity and respect for local culture is established throughout construction of the project. During this reporting period, between April 2015 and March 2016, there were eight ceremonies held for various purposes, including for the opening of the camp, the first concrete, for the south access road and the stream crossings. Fifty-one Aboriginal awareness training workshops were held in the past fiscal year.



One of the eight cultural site ceremonies held this year

In addition to the socio-economic monitoring activities that are ongoing during the construction phase of the project, future monitoring activities will include:

Business Opportunities:

- Key Person Interviews will be undertaken in Thompson, Gillam and each of the partner First Nation communities to understand any indirect business opportunities that may be generated as a result of the Project.
- Key Person Interviews will be undertaken with key participants involved in the management of the direct negotiated contracts (DNCs) to understand the role of partner First Nation businesses in implementation of the DNCs and how they contribute to building partner First Nation business capacity.

Housing:

- Key Person Interviews will take place to identify any apparent project effects on housing in the partner First Nation communities.

Infrastructure and Services:

- Key Person Interviews will take place to identify any apparent project effects on infrastructure and services in the partner First Nation communities.

Culture and Spirituality:

- A worker family survey will also be completed to assess the experiences of partner First Nation workers employed on project construction and their families.

Mercury and Human Health:

- The Mercury Human Health Implementation Group plans to implement components of the Risk Management Plan including providing mercury information sessions in partner First Nation, distributing communication products in coordination with local health programming and conducting voluntary hair monitoring and food surveys.

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Appendix 1: Northern Road Traffic Monitoring Data Collection Summary

1.0 INTRODUCTION

Manitoba Hydro, on behalf of the Keeyask Hydropower Limited Partnership received regulatory approval to commence construction of the Keeyask Generation Project (“the Project” or “KGP”) in July 2014.

The KGP follows the Keeyask Infrastructure Project (KIP), which included a start-up camp and associated infrastructure, a 25 km all weather north-access road, and the first phase of the Keeyask Generation Project main camp.

The KGP SEMP is intended to monitor changes over time for certain Valued Environmental Components (VECs). The SEMP focuses on key pathways of effect to, and components of, the socio-economic environment including;

- Economy,
- Population, Infrastructure and Services, and
- Personal, Family and Community Life

The SEMP is part of an integrated and coordinated Environmental Protection Program that has been developed to facilitate an effective transition from planning and assessment to implementation of all aspects of the Keeyask Generation Project.

This report focuses on monitoring for the Project to March 31, 2016.

2.0 OVERVIEW OF PROJECT

The Keeyask Generation Project is a 695 megawatt (MW) hydroelectric generating station located approximately 180 km northeast of Thompson and 40 km southwest of Gillam at Gull Rapids on the lower Nelson River. The Project consists of four principal structures: a powerhouse complex, a spillway, dams, and dykes. A reservoir will be created upstream of the principal structures. Supporting infrastructure consists of temporary facilities required to construct the principal structures and permanent facilities required to construct and operate the Project. Temporary infrastructure consists of work areas, cofferdams, rock groins, and an ice boom. Permanent supporting infrastructure consists of north and south access roads, a transmission tower spur, communications tower, some borrow areas, excavated-material placement areas, boat launches, and a portage to enable river traffic to bypass the dam.

3.0 OVERALL OBJECTIVES AND APPROACH

The KGP Environmental Impact Statement (EIS) identified primary effects to the socio-economic VECs and defined the process, scope, methods, documentation and application of the socio-economic monitoring for the Project. Overall, the intent of Manitoba Hydro and the partner First Nations has been to reduce adverse effects of the Project and to enhance Project benefits to the extent feasible and practicable. Monitoring information has been intended to assist in this management task. The SEMP for the Project is intended to monitor changes over time for certain VECs in order to, where applicable:

- Test predicted effects in the EIS;
- Identify unanticipated effects related to the Project;
- Monitor the effectiveness of mitigation measures;
- Determine if adaptive management is required; and
- Confirm compliance with regulatory requirements, including terms and conditions in Project approvals.

The SEMP focuses on key pathways of effect to, and components of, the socio-economic environment including;

- Economy
 - Employment and Training Opportunities
 - Business Opportunities, and
 - Income
- Population, Infrastructure and Services
 - Population
 - Housing
 - Infrastructure and Services, and
 - Transportation Infrastructure
- Personal, Family and Community Life
 - Public Safety and Worker Interaction
 - Travel, Access and Safety
 - Culture and Spirituality, and
 - Mercury and Human Health

The SEMP builds on the assessment studies conducted for the EIS using established methods for data collection and analysis.

4.0 OVERALL SCHEDULE

The SEMP will be more extensive during construction of the Project, but will also occur during the operation phase. SEMP activities will occur as follows;

- Construction Phase – SEMP monitoring during construction is related to employment and training opportunities; business opportunities; income; population changes; housing; infrastructure and services; transportation infrastructure; public safety and worker interaction; travel, access and safety; and culture and spirituality.
- Operation Phase – SEMP monitoring during operation is more limited, and is related to population change in Gillam during the first five years of operation; water levels at Split Lake (re: transportation infrastructure/travel safety); and monitoring related to mercury and human health.

5.0 STUDY AREA

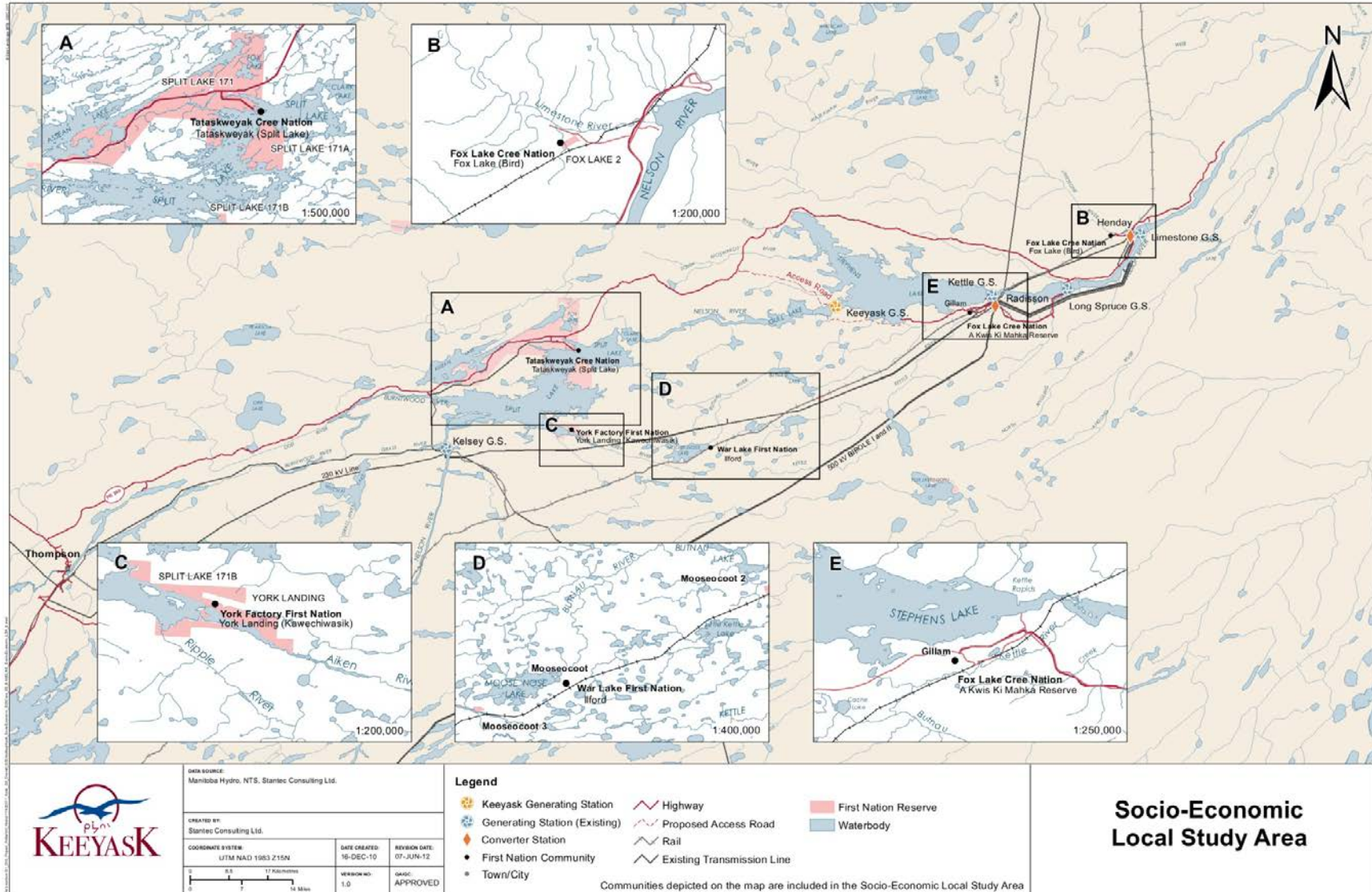
The Socio-Economic Local Study Area for the SEMP (see Map 1) incorporates the Project site, and includes the partner First Nation communities of Tataskweyak Cree Nation (TCN) at Split Lake, War Lake First Nation (WLFN) at Ilford, York Factory First Nation (YFFN) at York Landing and Fox Lake Cree Nation (FLCN) at Fox Lake/Gillam, which are affected by the Project through the following pathways of effect:

- Physical/biophysical changes to the way the landscape looks;
- Physical/biophysical effects on resource use/traditional use areas and heritage resources;
- Employment and business opportunities;
- Construction traffic;
- Interaction with non-local construction workers within the partner First Nations' home communities; and
- Investment income.

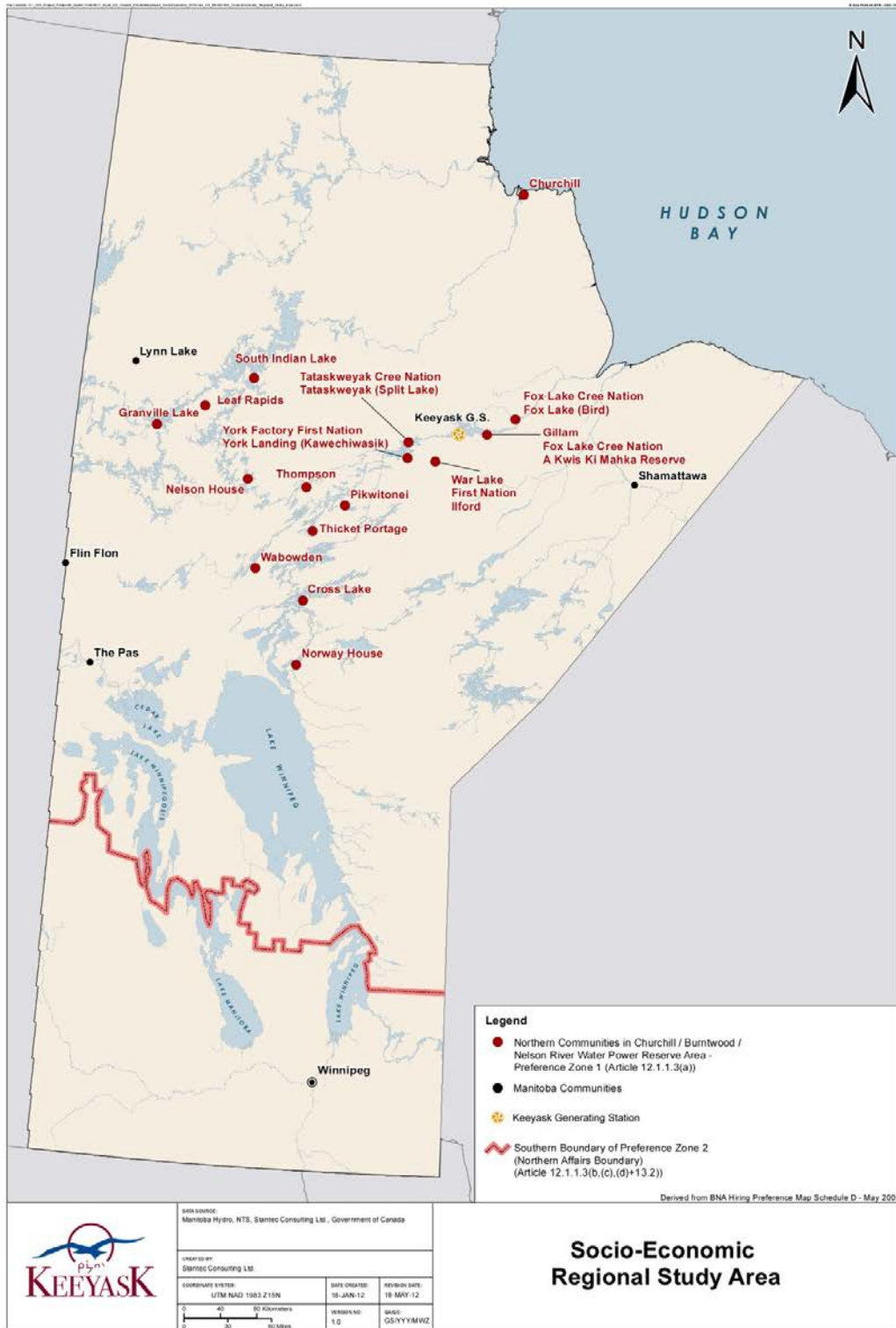
In addition to the partner First Nations' communities, the Town of Gillam and the City of Thompson are included in the Socio-Economic Local Study Area for the following reasons:

- The Town of Gillam is Manitoba Hydro's northern operations base and operational staff for the Project will be located there. Gillam is also home to FLCN Members living on reserve and both FLCN and TCN Members living off-reserve;
- Some of the Project's workforce are likely to visit Gillam and Thompson during their leisure time;
- Transportation/traffic for construction equipment, materials and people will flow primarily through Thompson, and some also via Gillam; and
- The City of Thompson is the regional centre for the Project and, as such, can be expected to experience increased expenditures on retail goods and services due to re-spending of wages by the Project construction workforce. Some commercial and industrial services in Thompson could see increased demand (e.g., air and freight travel through Thompson). As well, Thompson could receive additional pressure on regional health and social services.

Certain Project effects, in particular preferential hiring of northern Aboriginal and other northern workers for construction employment, will extend beyond the Socio-Economic Local Study Area to all of northern Manitoba. For this reason, the Socio-Economic Regional Study Area has been defined using the boundary identified under Schedule D of the Burntwood Nelson Agreement (BNA) (see Map 2) as the area pertaining to northern preference. This includes the Churchill-Burntwood-Nelson (CBN) communities identified in the BNA as part of hiring preference Zone 1.



Map 1: Socio-Economic Local Study Area



Map 2: Socio-Economic Regional Study Area

6.0 ECONOMY

Economic monitoring includes monitoring of all employment and training, business and income outcomes associated with the Project. Monitoring is conducted using a consistent method of approach Manitoba Hydro has used for other major capital projects.

All information regarding economic monitoring is provided from the start of Generating Station Project Activities to the end of March 2016.

6.1 EMPLOYMENT AND TRAINING

The Project EIS analysed and provided employment estimates for partner First Nations, the Aboriginal workforce in the CBN area and the Aboriginal workforce in the Socio-Economic Study Area as a whole (see SE SV Section 3.4.1) for the construction phase of the Project. The EIS also predicted that there would be northern participation in the operating jobs required to operate the facility.

Monitoring of employment and training is being undertaken first, to determine the overall employment outcomes of the Project construction, with particular emphasis on Aboriginal and northern resident participation, and second, to determine the extent to which recipients of pre-project training (PPT) participated in Keeyask construction jobs, and received on the job training. It was estimated that the levels of participation would be influenced by several factors, including timing of the opportunities and the level of interest by potential workers in pursuing those opportunities.

Monitoring of employment outcomes provides data on the success in attracting and retaining partner First Nation members, Aboriginal persons and Manitobans during Project Construction.

As noted within the SEMP, the Project has an established Advisory Group on Employment (AGE) that will continue to function throughout construction. This is a forum to address employment-related issues, in particular Aboriginal employment, related to construction of the Project. The AGE is established to receive, review and find solutions to concerns and issues and to monitor, report and make recommendations to the Project manager on employment-related matters, as required.

During construction, employment data is collected on site by contractors through an employee self-declaration form designed specifically for the Project ("Employee Report- Keeyask Project"). All completed forms are provided by on-site contractors to Manitoba Hydro, and stored in a central database for the Project. Contractors also provide information to Manitoba Hydro on hours worked and labour income to enable calculations for person years and income estimates during construction. Employment data is provided in the categories outlined below:

- Person years – When part-time and/or seasonal workers are used, it is useful to standardize the hires in terms of person years of employment. A person year of

employment is defined as the amount of work that one worker could complete during twelve months of full-time employment. For construction planning purposes and to compare to the EA Report, the number of hours worked per year is approximately 3000 (assuming 60 regular hours weekly) in most trade categories. For economic comparison purposes, the number of hours worked per year is approximately 2000 (assuming 40-44 regular hours weekly). As this report can be used for various types of comparisons, the data has been presented in terms of 3000 and 2000 hours per year.

- Hires - Refers to the number of people hired on the Project site for any duration.
- Employees - Refers to the number of individuals hired. The difference between Hires and Employees can be attributed to an individual being hired to the Project more than once.
- Type (job classifications) of work available.

Training data is collected by Manitoba Hydro through established methods utilizing contractor on the job reporting, and the completion of the Employee Report - Keeyask Project progression tracking section. Hydro Northern Training and Employment (HNTEI) pre-project trainees (PPTs) are tracked by comparing self declared Employee Report information to the Manitoba Hydro HNTEI database.

6.1.1 PERSON YEARS OF EMPLOYMENT

Since the start of construction to the end of March, 2016 the Project generated 2158 person years of employment in terms of a 2000 hour per year basis (1439 person years of employment in terms of a 3000 hour per year basis). See the Table 1 below for the breakdowns of person years of employment.

Table 1: Person Years of Employment (Start of Construction to end of March, 2016)

	3,000 ¹ hours	2,000 ² hours	% of Total Person Years
CBN	321	482	22%
Aboriginal	653	979	45%
Non-Aboriginal	786	1179	55%
Northern Manitoba Aboriginal	461	692	32%
Northern Manitoba Non-Aboriginal	49	74	3%
Manitoba	1143	1714	79%
Non-Manitoba	296	444	21%

Note: Figures above are not additive.

1. This number is used for construction planning purposes and to compare to the numbers in the EA Report.

2. This number is used for economic comparison purposes.

6.1.2 HIRES

Since the start of construction to the end of March 2016 there were 4276 hires on the Project. See Table 2 below for the breakdown of total hires.

Table 2: Number of Hires (Start of Construction to end of March, 2016)

	Hires	% of Total Hires
CBN	1251	29%
Aboriginal	2124	50%
Non-Aboriginal	2152	50%
Northern Manitoba Aboriginal	1618	38%
Northern Manitoba Non-Aboriginal	103	2%
Manitoba	3411	80%
Non-Manitoba	865	20%

Note: Figures above are not additive.

6.1.3 INDIVIDUAL EMPLOYEES

Since the start of construction to the end of March 2016, a total of 3242 individual employees were hired on the Project. See Table 3 below for the breakdown of total employees.

Table 3: Total Individual Employees (Start of Construction to end of March, 2016)

	Employees	% of Total Employees
CBN	822	25%
Aboriginal	1458	45%
Non-Aboriginal	1784	55%
Northern Manitoba Aboriginal	1068	33%
Northern Manitoba Non-Aboriginal	81	2%
Manitoba	2475	76%
Non-Manitoba	767	24%

Note: Figures above are not additive.

The total number of individual employees is less than the total number of hires because the same individual may have been hired more than once. For example, an individual may have moved to work on a different contract or moved to a different job classification to improve their position. The difference of 1034 identifies the number of re-hires at the project site.

The number of individual employees to date does not reflect the number of employees on site at a given time. The number of employees on site at any given time varies depending on the work in progress and the time of year. The number of employees on site is usually highest during the period from late spring through early fall, which is typically the period with the highest level of construction activity. The actual number of employees on site over the course of the year

ultimately depends upon the work plans and schedules of the contractors for the various project components, in conjunction with the provisions of the Burntwood-Nelson Agreement, which is the collective bargaining agreement for the Project.

6.1.4 TYPE (JOB CLASSIFICATIONS) OF WORK AVAILABLE

The total cumulative hires by job classification (to the end of March 2016) are provided in Table 4 below. For employee privacy and confidentiality reasons, the numbers of hires by residency cannot be disclosed, as the numbers are low for some of the classifications listed.

Table 4: Total Hires by Job Classification (Start of Construction to end of March, 2016)

Job Classification	Total Hires	% of Total Hires	CBN	Aboriginal	Non-Aboriginal	Northern MB	Other MB
Labourers	798	19%	368	540	258	476	172
Security Guards	84	2%	13	35	49	29	55
Crane Operators	30	1%	<5	7	23	<5	24
Equipment Operators	544	13%	104	232	312	151	235
Teamsters	418	10%	171	275	143	227	149
Carpenters	251	6%	30	107	144	52	168
Millwrights	5	<1%	<5	<5	<5	<5	5
Painters	6	<1%	<5	<5	5	<5	6
Floor Covering Installers	9	<1%	<5	<5	9	<5	8
Insulator Workers	58	1%	<5	6	52	<5	46
Lathing and Drywall Workers	42	1%	<5	8	34	<5	14
Cement Masons	12	<1%	<5	6	6	<5	7
Sheet Metal Workers	10	<1%	<5	<5	8	<5	10
Roofers	10	<1%	<5	<5	10	<5	10
Sheeters, Deckers and Cladders	25	1%	<5	7	18	<5	24
Boilermakers	8	<1%	<5	<5	7	<5	6
Iron Workers	109	3%	<5	31	78	9	91
Rodmen	14	<1%	<5	8	6	<5	11
Electrical Workers	182	4%	20	43	139	36	139
Plumbers and Pipefitters	70	2%	8	23	47	8	62
Refrigeration Workers	<5	<1%	<5	<5	<5	<5	<5
Sprinkler System Installers	<5	<1%	<5	<5	<5	<5	<5
Office and Professional Employees	237	6%	54	104	133	81	101
Caterers	586	14%	418	563	23	552	18
Elevator Constructors	6	<1%	<5	<5	6	<5	6
Other*	758	18%	60	124	634	93	320
Total Hires	4276	100%	1251	2124	2152	1721	1690

*The "Other" category refers to hires in job classifications not covered by the BNA, i.e. "out of scope" positions. This would include managerial and supervisory staff (both Contractor and Manitoba Hydro), other Manitoba Hydro on-site staff and certain technical staff (engineers and technicians).

6.1.5 RATES OF TURNOVER

There have been 1108 occurrences where employees were discharged (223 occurrences) or resigned (885 occurrences). This represents a rate of turnover of 26.4% of total hires. The majority of turnover, 80 percent, is comprised of resignations as opposed to discharges.

Turnover is calculated as total incidents of discharges and resignations divided by total hires¹ and does not include layoffs or transfers to other positions or contracts. Resignations represents all situations where an individual chooses to leave a job. Table 5 below outlines turnover rates for specific segments of the Keeyask labour force, as well as the breakdown of discharges and resignations.

Table 5: Turnover³ (At March, 2016)

	Total Discharges	Total Resignations	Total Separations	Rate of Turnover
CBN	113	424	537	43.0%
Aboriginal	161	602	763	36.2%
Non-Aboriginal	62	283	345	16.5%
Northern Manitoba Aboriginal	125	509	634	39.3%
Northern Manitoba Non-Aboriginal	7	21	28	27.2%
Manitoba	195	786	981	29.4%
Non-Manitoba	28	99	127	14.7%
Total Labour Force	223	885	1108	26.4%

Notes:

1. Figures above are not additive.
2. Turnover is calculated as the total incidences of discharges and resignations divided by total hires for each classification. In the 2014/15 Annual Report, the rate of turnover was reported incorrectly and has been corrected here.

There have been instances where individuals have been discharged or resigned, but later returned to work on the Project (i.e., they were rehired). This occurred 160 times, approximately 14 percent of the total discharges and resignations.

It is also useful to look at the amount of turnover within certain time periods throughout the life of the project. When looking at a specific period within the life of the project, turnover is expressed as total incidents of separation (for discharges and resignations), divided by hires working on site within that specific time period. Since the start of construction, and as shown in the Table 6 below, the amount of turnover within a given quarter has ranged from 9.3% to 13.9%. Of this, turnover among Aboriginal employees has ranged from 11.9% to 21.2% and among non-Aboriginal employees from 4.5% to 10.2%. While there has been variation in the amount of

¹ Turnover calculations exclude hires associated with Contract 016125 (Emergency Medical Services) as hiring and work scheduling practices for this contract are unique, and do not present true on-site turnover.

turnover across each quarter, overall the amount of turnover for the workforce in Q1, 2016 is lower than in Q3, 2014. Among Aboriginal workers the amount of turnover is higher in Q1, 2016.

Table 6: Quarterly Turnover¹

Residency Or Ancestry	2014		2015				2016
	Q3	Q4	Q1	Q2	Q3	Q4	Q1
CBN	11.8%	21.1%	18.4%	24.7%	20.5%	20.3%	20.0%
Aboriginal	11.9%	18.1%	15.4%	21.2%	17.5%	17.3%	14.6%
Non-Aboriginal	9.4%	10.2%	5.7%	7.1%	6.2%	5.6%	4.5%
Northern Manitoba Aboriginal	12.6%	21.8%	16.9%	23.0%	19.4%	19.6%	17.7%
Northern Manitoba Non-Aboriginal	21.7%	7.1%	12.0%	13.5%	1.9%	4.8%	10.9%
Manitoba	11.5%	14.6%	11.4%	15.2%	12.4%	13.1%	11.1%
Non-Manitoba	5.4%	10.5%	5.0%	5.7%	6.9%	6.2%	3.9%
Total Workforce Quarterly TO	10.6%	13.9%	10.2%	13.2%	11.1%	11.4%	9.3%

Note: The table above represents the % turnover per Residency or Ancestry and not of total project.

6.1.6 TRAINING

Since the start of the Project, a total of 135 individuals have been employed in construction trades as trainees or apprentices. Trainees and apprentices have gained employment in the trade classifications of carpenters, electricians, plumbers, sheet metal workers, rodmen, and heavy equipment operators. To date, 40 of these individuals have successfully advanced within their training or have achieved Journeyman status and 80 remain as active trainees, apprentices or employees on the Project.

There have been a total of 211 employees training in the service trades of security, catering, janitorial and housekeeping positions. There are 6 employees training in the Fitness Leader Trainer program and 19 in the Red Seal Chef training program at this time.

In addition to trainees and apprentices, 279 individuals employed on the Project site were participants of the past HNTEI PPT Program. HNTEI PPT Program trainees have gained employment in craft trade positions as labourers, security guards, crane and equipment operators, teamsters, carpenters, rodmen, electrical workers, plumbers and pipefitters, office and professional employees and caterers. They have also gained employment in out-of-scope positions such as safety and environmental staff, employee retention and support staff and as trade supervisors. Of the 279 individuals, 131 remain active on the project.

¹ Turnover calculations exclude hires associated with Contract 016125 (Emergency Medical Services) as hiring and work scheduling practices for this contract are unique, and do not present true on-site turnover.

6.2 BUSINESS

Project construction presents business opportunities locally, regionally and across the Province. Business outcomes are measured using data on the direct expenditures of the Project for goods and services, with a focus on purchases from partner First Nation, Aboriginal and northern Manitoba businesses. Additional data will be collected to understand indirect business opportunities generated as a result of Project-related expenditures in Gillam, Thompson and the partner First Nation communities. Data on Project induced business opportunities will be collected through the following mechanisms:

- Existing Project data collection processes tracking direct project expenditures
- Indirect business opportunities survey
- Direct Partnership business opportunities survey

6.2.1 DIRECT PROJECT EXPENDITURES

There was \$ 1,274.2 million spent on goods and services for the Project. Of this, \$ 514.2 million were Manitoba purchases. Total northern Manitoba (Aboriginal and non-Aboriginal) purchases represent \$310.9 million or 60% percent of total Manitoba purchases. *The information provided represents direct purchases of the Project for contractors and services. Indirect purchases made by a contractor, in turn, would include purchases of goods and services from Manitoba based businesses.*

Table 7 below summarizes the breakdown of total direct purchases to date.

Table 7: Direct Purchases

	\$ (Millions)	% of Total
Manitoba	514.2	40.4%
Northern Manitoba Aboriginal	308.1	
Other Northern Manitoba	2.8	
Other Manitoba	206.1	
Outside of Manitoba	759.9	59.6%
Other	0.1	<0.1%
Total	1,274.2	

6.2.2 INDIRECT BUSINESS OPPORTUNITIES SURVEY

With respect to indirect business effects, the Project SEMP defined scope to undertake a survey of Key Person Interviews (KPIs) in Thompson, Gillam and each of the partner First Nation

communities to ascertain any indirect business opportunities that may be generated as a result of the Project.

This KPI program will be undertaken at the peak of the General Civil Contract activities estimated to occur in year 3 or 4 of the construction phase.

6.2.3 DIRECT PARTNERSHIP BUSINESS OPPORTUNITIES SURVEY

As part of the JKDA, Manitoba Hydro and the partner First Nations committed to a series of business opportunities for the Project to negotiate as Direct Negotiated Contracts (DNCs) with partner First Nation businesses.

As noted within the Project SEMP, a KPI program of key participants involved in management of the DNCs will be undertaken to understand the role of partner First Nation businesses in the implementation of the DNCs and how they contribute to building partner First Nation business capacity.

This KPI program is planned to be implemented in years 4 and 8 of the construction phase and results will be reported thereafter directly to the Partnership.

6.3 INCOME

The results of income monitoring include estimates of labour income. This is viewed as an important indicator of the direct economic impact of the Project. Income levels affect the general standard of living of individuals and families.

6.3.1 LABOUR INCOME

The estimate of labour income reflects the direct income earned by workers from employment on the Project. It is the sum of wages and salaries associated with direct person years of employment¹. Total labour income earned to end of March 31, 2016 is approximately \$193.9 million. Table 8 lists the breakdown of labour income earned on the Project.

¹ Labour income is calculated based on information provided by contractors and Manitoba Hydro.

Table 8: Labour Income

	Labour Income (Millions)	% of Total
Partner First Nations	\$25.8	13%
CBN	\$34.0	18%
Aboriginal	\$74.0	38%
Non-Aboriginal	\$119.9	62%
Northern Manitoba	\$48.6	25%
Other Manitoba	\$94.9	49%
Non-Manitoba	\$50.5	26%

Note: Figures above are not additive

6.4 EMPLOYMENT MITIGATION

In fall 2015, the Keeyask AGE established a sub-committee on training and employment. The sub-committee engages on a regular basis and is working to address identified issues in the current formal systems and processes relating to the employment and training of partner First Nation Members at Keeyask in both designated and non-designated trades. The sub-committee has senior representatives from each of the partner First Nation communities, Manitoba Hydro, the General Civil Contractor (BBE) and the Province of Manitoba [Apprenticeship Manitoba, Training and Employment Services, Job Referral Service (JRS) and Workforce Education Manitoba].

Throughout the 2015/2016 winter months, members of the AGE Sub-committee held information sessions in the four partner First Nation communities, as well as in the communities of Thompson, Gillam, Churchill, Winnipeg and at the Keeyask Site.

Holding the career sessions directly in the communities allowed a more hands-on approach to engage and encourage individuals to consider the employment and apprenticeship opportunities on the Keeyask Project. As construction activity ramps up in Spring 2016, communication of available opportunities across the project – whether it's carpentry, general construction, or support services is required to address the attraction and retention labour risks on the Project. This was a very important initiative undertaken to ensure job seekers are aware of the opportunities, so they can apply for the jobs that most interest them.

During the sessions, participants learn about the upcoming work at Keeyask, apprenticeship and on-the-job training programs, life at Keeyask Camp, and an opportunity to talk directly with the contractors working on the project.

The Province of Manitoba's JRS and community Job Seeker Managers are attending to ensure participants are properly registered in the JRS. Apprenticeship Manitoba staff are also attending to explain more about what it means to be involved in the Provincial Apprenticeship Program.

In January 2016, the Project established enhancements within the BNA to mitigate risks attributed to attraction and retention for workers on the project. These included wage

adjustments, completion bonuses, isolation leave frequency options, and introduction of health and welfare trust funds, for specific jurisdictions.

7.0 POPULATION, INFRASTRUCTURE AND SERVICES

7.1 POPULATION

The Project's EIS predicted that the Project would not result in notable changes to population in the partner First Nation communities, and that net in-migration associated with Project construction would be quite small. Similarly, Gillam was not predicted to see any substantial population growth as a result of Project-related construction, and Thompson was also not expected to see any material construction-related population change. However, accurately identifying the precise levels of in- and out-migration is difficult, and the partner First Nations have noted that any in-migration to their communities could stress services already at capacity. Population is being monitored to confirm the extent of Project-induced migration in the partner First Nation communities and Gillam.

7.1.1 PARTNER FIRST NATION COMMUNITIES

The Partnership has monitored the total on-reserve and on own Crown land populations of each of the partner First Nations. The total on-reserve and on own Crown land population of the partner First Nations represents the population most likely to access housing, infrastructure and services on reserve.

Population monitoring is based on data from Indigenous and Northern Affairs Canada, from December 31, 2003 to December 31, 2015. The growth rate in the pre- (2003–2014) and post-construction (2014-2015) periods are reported to show change that has occurred since the Project began.

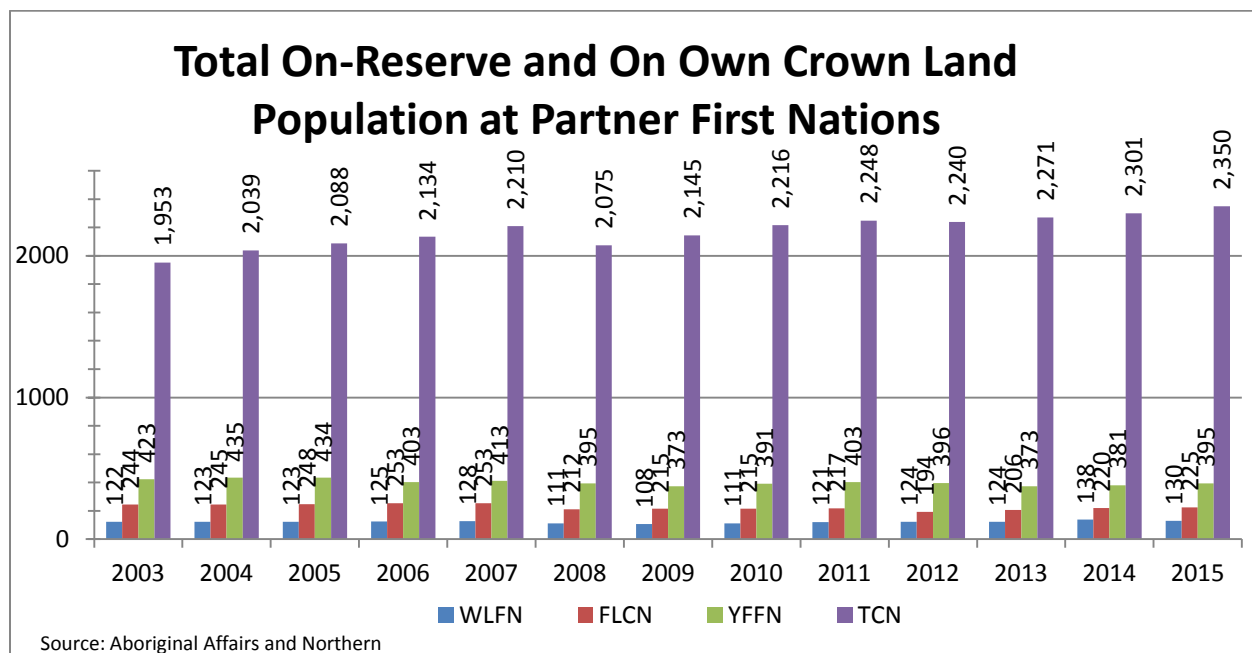
Between 2003 and 2015, the total on-reserve and on own Crown land population of TCN increased by 397 people, representing an average annual growth rate of 1.6%. Between 2014 and 2015 specifically, TCN's on-reserve and on own Crown land population increased by 49 people. The average annual growth rate was 1.5% prior to construction (between 2003 and 2014) and 2.1% following construction (between 2014 and 2015).

Between 2003 and 2015, the total on-reserve and on own Crown land population of WLFN increased by 8 people, representing an average annual growth rate of 0.5%. Between 2014 and 2015 specifically, WLFN's on-reserve and on own Crown land population decreased by 8 people. The average annual growth rate was 1.1% prior to construction (between 2003 and 2014) and -5.8% following construction (between 2014 and 2015).

Between 2003 and 2015, the total on-reserve and on own Crown land population of YFFN decreased by 28 people, representing an average annual growth rate of -0.6%. Between 2014 and 2015 specifically, YFFN's on-reserve and on own Crown land population increased by 14 people. The average annual growth rate was -0.9% prior to construction (between 2003 and 2014) and 3.7% following construction (between 2014 and 2015).

Between 2003 and 2015, the total on-reserve and on own Crown land population of FLCN decreased by 19 people, representing an average annual growth rate of -0.7%. Between 2014 and 2015 specifically, FLCN's on-reserve and on own Crown land population increased by 5 people. The average annual growth rate was -0.9% prior to construction (between 2003 and 2014) and 2.3% following construction (between 2014 and 2015).

A comparison of partner First Nations' on-reserve and on own Crown land populations from 2003 to 2015 is provided in Figure 1 below.



All partner First Nation population statistics are reported as at December 31, and are based on a First Nation's registered population on its own reserve and own Crown land, as published by Indigenous and Northern Affairs Canada (INAC).

Source: INAC, 2015

Figure 1: Comparison of Partner First Nation Populations from 2003 to 2015

7.1.1.1 TOWN OF GILLAM

Based on data from Manitoba Health's annual health statistics, the total population at Gillam increased from 1,171 to 1,305, an increase of 134 people, between June 1, 2008 and June 1, 2015. This represents an average annual growth rate of 1.6% over the period. Between 2014 and 2015 specifically, the total population of Gillam decreased by 34 people. The average annual growth rate was 2.3% prior to construction (between 2008 and 2014) and -2.5% following construction (between 2014 and 2015).

A comparison of the Gillam population from 2008 to 2015 (as of June 1) is provided in Figure 2 below.

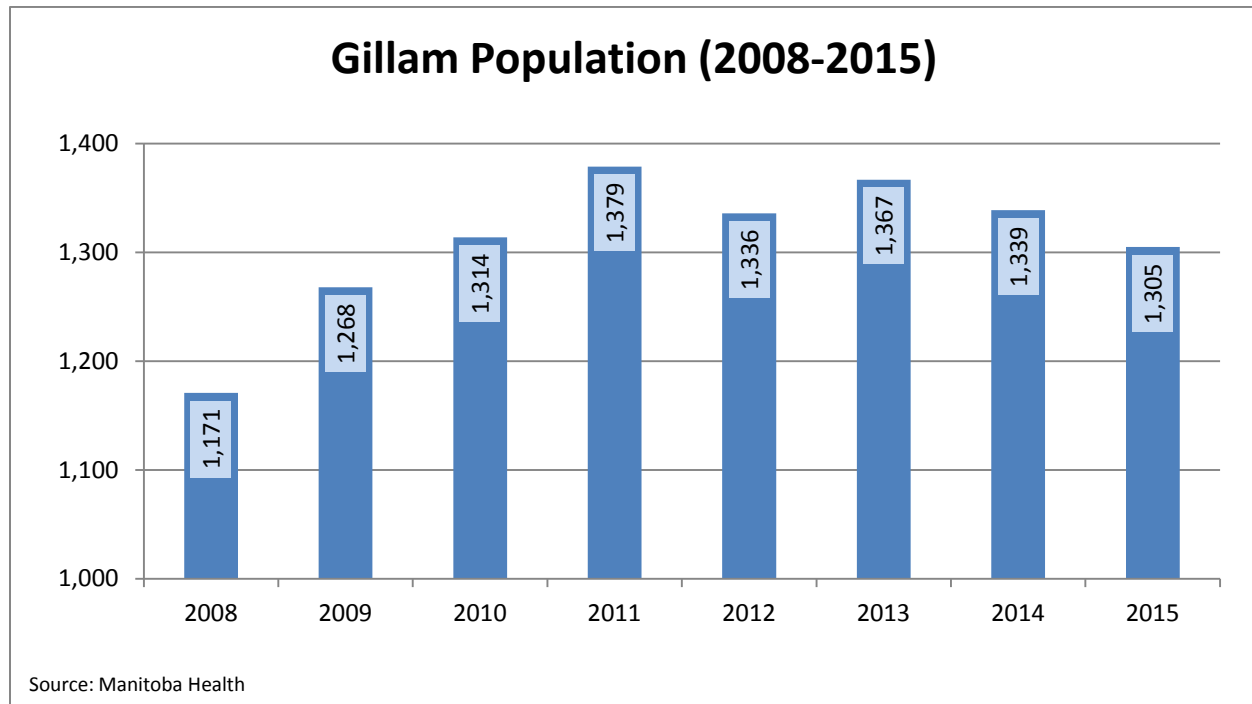


Figure 2: Gillam Population from 2008 to 2015

7.2 HOUSING

Little new demand for housing in the partner First Nation communities and in Gillam is anticipated during project construction. One-time KPIs will take place during project construction to identify any apparent project effects on housing in the partner First Nation communities. Manitoba Hydro and the partner First Nations have initiated discussions regarding the design and implementation of the KPIs planned for the next fiscal year.

7.3 INFRASTRUCTURE AND SERVICES

Minimal effects on infrastructure and services in the partner First Nations are expected. One-time KPIs will take place during project construction to identify any apparent project effects on infrastructure and services in the partner First Nation communities. Manitoba Hydro and the partner First Nations have initiated discussions regarding the design and implementation of the KPIs planned for the next fiscal year.

Given Gillam's proximity to the construction site, and also other Manitoba Hydro projects currently underway, it is anticipated that Gillam may experience effects on infrastructure and

services associated with short-term influxes of construction workers. Pertinent information related to the effects of non-local construction workers on the demand for infrastructure and services in Gillam is anticipated to be provided through the Gillam Worker Interaction Subcommittee (discussed in Section 8.1 below).

7.4 TRANSPORTATION INFRASTRUCTURE

During construction, project effects on road-based travel are anticipated to stem from increased vehicular traffic associated with transport of people (construction personnel and service providers), equipment and materials on roads in the area, particularly Provincial Road 280 (PR 280).

Traffic volume information has been obtained from the Manitoba Highway Traffic Information System (MHTIS) website for the years 2005, 2007, 2009, 2011, 2013 and 2015. This information is based on data collected by Manitoba Infrastructure and Transportation (MIT) for PR 280 and PR 290 on a biennial basis, and includes estimates of annual average daily traffic (AADT), which is the number of vehicles passing a point on an average day of the year.

Traffic data from the MHTIS for PR 280 between PR 391 and the PR 280/PR 290 intersection is divided into two segments; PR 391 to Split Lake and Split Lake to the PR 280/PR 290 intersection. A summary of the AADT for these segments of PR 280 for past years is provided in Table 9 below (rounded to the nearest five). Further detail is provided in Manitoba Hydro's Northern Road Traffic Monitoring Data Collection Summary (Attachment 1 to this Report).

Table 9: Summary of AADT for segments of PR 280 from 2003 to 2015.

Highway	Segment	Average AADT						
		2003	2005	2007	2009	2011	2013	2015
PR 280	PR 391 to Split Lake	230	155	135	175	210	270	340
	Split Lake to PR280/290	115	95	95	120	140	160	230
	PR280/290 to Gillam	205	210	235	225	255	375	450

Collision data for PR 280 for the years 2005 to 2015 has also been provided by Manitoba Public Insurance. There were a total of 139 collisions on PR 280 between 2005 and 2015; an average of 12.6 collisions per year. Collisions during the spring and fall months were most frequent, accounting for 27 and 35 percent, respectively, of all collisions over the eleven-year period. Single vehicle collisions were most frequent, accounting for approximately 92 percent of all collisions during the analysis period.

The Keeyask North Access Road connects PR 280 to the construction site. It is a private road with restricted access, which is controlled by means of a gate at the PR 280/access road intersection. The gate office is staffed 24 hours per day, seven days per week and security staff document all authorized vehicles entering and exiting the road. Monitoring of traffic volume on the access road takes place through the gate's records and through security reports from patrols.

The tables below provide a summary of traffic use on the North Access Road from August 2014 to December 31, 2015. On average, 104 vehicles per day used the road during 2015.

Table 10: 2014 North Access Gate Count Records for Keeyask Generation Project

Traffic Count	2014					Summary
	Aug	Sep	Oct	Nov	Dec	
Total Vehicles	2,919	3,425	3,008	2,531	2,124	14,007
Daily Average	94	114	97	84	69	92

Table 11: 2015 North Access Gate Count Records for Keeyask Generation Project

Traffic Count	Total Vehicles	Daily Average
Jan	2,605	84
Feb	2,693	96
Mar	3,759	121
Apr	2,549	85
May	2,440	79
June	2,875	96
July	2,852	92
Aug	2,696	87
Sep	4,312	144
Oct	5,308	171
Nov	3,495	117
Dec	2,376	77
Summary	37,960	104

Table 12: 2014 North Access Gate Records by Vehicle Classification for Keeyask Generation Project

	Aug	Sep	Oct	Nov	Dec	Summary
Site Personnel	2,228	2,620	2,575	1,790	1,560	77%
Suppliers/Deliveries	144	230	192	235	235	7%
Visitors/Guests	547	575	241	506	329	16%
Resource Users	0	0	0	0	0	0%
Total	2,919	3,425	3,008	2,531	2,124	

Table 13: 2015 North Access Gate Records by Vehicle Classification for Keeyask Generation Project

Month	Site Personnel	Suppliers/Deliveries	Visitors/Guests	Resource Users	Total
Jan	2,004	330	271	0	2,605
Feb	2,151	375	167		2,693
Mar	3,052	433	274	0	3,759
Apr	2,092	328	129	0	2,549
May	1,986	321	133	0	2,440
June	2,368	299	208	0	2,875
July	2,423	323	106		2,852
Aug	2,255	312	129	0	2,696
Sep	2,840	1206	266	0	4,312
Oct	3,378	1623	307	0	5,308
Nov	2,799	350	346	0	3,495
Dec	2,057	217	102	0	2,376
Summary	78%	16%	6%	0%	

8.0 PERSONAL, FAMILY AND COMMUNITY LIFE

8.1 PUBLIC SAFETY AND WORKER INTERACTION

A Worker Interaction Subcommittee was established by Manitoba Hydro prior to the beginning of Keeyask construction. This Subcommittee is part of a corporate-wide initiative to address anticipated increases in the Gillam area workforce resulting from Keeyask and other Manitoba Hydro projects being constructed in an overlapping timeframe.

The Subcommittee is intended as a forum for information sharing and communication for early identification of potential worker interaction concerns, prevention of issues to the extent possible, and identification of ways to work cooperatively to address issues as they arise including any related increases in the demand for services and accommodation in Gillam. In addition to Manitoba Hydro, FLCN, and the Town of Gillam, other stakeholder members are determined on an as-needed basis.

In the period from January 1, 2015 to March 31, 2016, the Subcommittee met three times: in June 2015, September 2015, and January 2016.

8.2 TRAVEL, ACCESS AND SAFETY

8.2.1 WATER/ICE-BASED TRAVEL

No SEMP monitoring related to water/ice-based travel will be undertaken during the construction phase of the project. However, information on Waterways Management Program debris-related activities during construction is available through the Physical Environment Monitoring Plan.

8.2.1.1 ROAD-BASED TRAVEL, ACCESS AND SAFETY

Information on traffic related collisions on PR280 and use of the access roads are contained in Section 3.4 Transportation Infrastructure.

8.3 CULTURE AND SPIRITUALITY

Measures were in effect during the reporting period to support the retention of northern and Aboriginal employees at the job site and to ensure that sensitivity and respect for local culture is established throughout construction of the project. These measures include on-site Aboriginal awareness activities and retention support programs, orientation programming, Aboriginal awareness training for employees, voluntary counseling services and cultural ceremonies prior to many key construction activities. A worker family survey will also be completed to assess the experiences of partner First Nation workers employed on project construction and their families.

8.3.1 ABORIGINAL AWARENESS ACTIVITIES AND RETENTION SUPPORT PROGRAMS

Since the start of construction, various measures were put in place to support the retention of northern and Aboriginal employees at the job site, and to ensure that sensitivity and respect for local culture is demonstrated throughout construction of the Project. These measures include establishing the Employment Retention and Support (ERS) Services contract where scope was developed jointly with the Keeyask Fox York Joint Venture who endeavored to include all partner First Nations' interests. The ERS contractor began delivery of services during the KIP and continued into the Generating Station Project. Services include orientation sessions for partner First Nation Members, on-site Aboriginal awareness training for employees, voluntary counseling services, and cultural ceremonies marking key construction activities.

8.3.1.1 PARTNER FIRST NATION MEMBERS ORIENTATION

The purpose of these orientation sessions, delivered in the communities, is to prepare partner First Nation Members for the camp construction experience and enhance their prospects of achieving the benefits from employment on the Keeyask Project. The focus is on key factors that affect the economy, culture and social conditions of each partner First Nation. This includes the historical and ongoing effects of hydro development and relationships with Manitoba Hydro. Seven sessions have been held to date on the project.

8.3.2 ABORIGINAL AWARENESS TRAINING

On-site training workshops are provided for staff working at the Keeyask site. Fifty-one training workshops were held in the past fiscal year. The purposes of training workshops are to;

- increase understanding and appreciation of the cultural differences, beliefs and values of individuals within the various parties/communities working at the site;
- enhance comfort in living, working and/or doing business in a culturally diverse environment;

- identify barriers and issues between the various parties working at the site;
- identify common goals;
- develop strategies and an action plan for addressing issues/barriers, reaching common goals as well as developing and maintaining long-term harmonious relationships;
- increase participants' understanding of contemporary issues facing Aboriginal peoples;
- challenge participants to re-think their assumptions and personal biases about Aboriginal peoples; and
- provide participants with information that will promote understanding and respect of Aboriginal cultures, enabling participants to work effectively with Aboriginal peoples.

Training is a requirement for all staff working at the Keeyask Site.

8.3.3 ON-SITE COUNSELING

On-site counseling is available to help all employees, on a voluntary basis, to deal with any issues experienced while working on the Project. This could include, for example, work adjustment problems, vocational/career issues, cultural adjustments, family stresses and money management. The intent is to reduce attrition for all project workers, but particularly for Northern Aboriginal workers of Cree heritage, by assisting them in dealing with problems directly affecting their work performance.

8.3.4 CULTURAL SITE CEREMONIES

Site ceremonies are held at key construction milestones to help mitigate the effect of the Project on partner First Nations' culture, and to demonstrate respect for the land and all that is supported by the land. Ceremonies are organized by the Fox & York Keeyask Joint Venture Company, and attendance, both welcome and voluntary, consists of various partner First Nation Members at large, and staff of the contractor and Manitoba Hydro. In this reporting period, between April 2015 and March 2016, there were eight ceremonies held for various purposes, including for the opening of the camp, the first concrete, for the south access road and the stream crossings.

8.3.5 WORKER/FAMILY SURVEY

During the upcoming year, the partnership will conduct a worker and family survey of a sample of partner First Nation workers employed on project construction and their families to assess their employment experience. Manitoba Hydro and the partner First Nations have initiated discussions regarding the design and implementation of the worker and family survey.

8.4 MERCURY AND HUMAN HEALTH

Because project effects of methylmercury will occur post-impoundment (as a result of flooding associated with the Project), the majority of related monitoring will occur in the operation phase. The Partnership has prepared a Mercury & Human Health Risk Management Plan in consultation with Health Canada, Manitoba Health, and Manitoba Conservation and Water Stewardship, in order to identify, assess, respond to, communicate and monitor risks to human health from increased methylmercury in the environment as a result of the Keeyask Project. A group made up of the partner First Nations, Manitoba Hydro, provincial and federal health specialists will oversee carrying out the plan.

The goals of future monitoring include activities to support discussion and build understanding around mercury and fish; to allow individuals and families to confidently assess and manage the benefits and risks associated with eating wild fish in the Project area; to support and enhance local practices of fishing for sharing, and eating wild-caught fish at levels that are healthy for all community members.

NORTHERN ROAD TRAFFIC MONITORING QUARTERLY DATA COLLECTION SUMMARY MARCH 2016



Traffic Monitoring Station on PR280 (site 10 – looking west)

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Executive Summary

Construction-related impacts associated with travel and transportation for the development of the Keeyask Project and Bipole III Transmission Project will generate additional traffic on various areas of the Provincial Road network. Three types of traffic are anticipated to occur – local traffic, workforce traffic and shipping of materials.

While the Environmental Impact Statements (EIS) for both the Keeyask and BP III projects predicted that existing transportation networks and plans for PR 280 upgrades would be able to accommodate the changes associated with Project construction, community concerns remain regarding traffic safety and road conditions. Manitoba Infrastructure (MI – formerly Manitoba Infrastructure and Transportation) is responsible for the existing provincial highway system, including the maintenance and upgrading to PR 280. Monitoring efforts are being undertaken with information available from Manitoba Public Insurance (MPI) and MI to assess EIS predictions and respond to community concerns.

Traffic monitoring stations have been installed at five locations on PR 280 and PR 290. MI installed and are maintaining the stations with funding for the additional equipment supplied by Manitoba Hydro (MH). MI collects the data from the stations and submits monthly data to MH. Traffic data collected to date shows an increase in traffic volume at all monitoring stations however, these additional traffic volumes still remain within the roadway design tolerances.

Background

Traffic Study

The Environmental Impact Statements (EIS) for both the Keeyask Project and the Bipole III Transmission Project (BP3) contain requirements for continual traffic monitoring throughout the lifespan of these projects. In addition, local concerns have increased the need for a comprehensive traffic monitoring program.

Based on the monitoring requirements for the Projects, MH developed a comprehensive traffic monitoring program which includes five traffic counters on PR 280 and PR 290 as shown on the traffic monitoring Locations Map in **Appendix C**. These traffic counters along with the data from the site access gates for Keeyask and the Keewatinohk Converter Station will help provide an understanding of traffic patterns in the area. PR 280 and PR 290 are Provincial roads that fall under MI jurisdiction. The Conawapa Access Road, which begins at the east end of PR 290 near the Limestone Generating Station is a Manitoba Hydro privately owned roadway. A security gatehouse has been installed along the Conawapa Access Road to limit access to construction traffic only during the construction of the Keewatinohk Converter Station.

The anticipated increase in traffic volumes on PR 280 and PR 290 will not exceed the current design rating for these roads. Localized upgrades were recommended to address safety concerns and improve reliability. Continuous monitoring of traffic volumes on these roads was recommended by two separate engineering studies.

Traffic Monitoring Stations

Please refer to **Appendix C** for a map of locations of the traffic monitoring stations. Traffic volumes on Provincial Roads (PR) are monitored through the Manitoba Highway Traffic Information System (MHTIS) which is a partnership between MI and the University of Manitoba Transport Information Group (UMTIG). PR 280 and PR 290 are monitored biennially using coverage traffic count stations. Coverage count stations (CCS) are short-term traffic count stations where sites are surveyed on a three-year cycle (a two year cycle was used for PR 280 and PR 290).

MH has worked closely with MI to acquire more detailed traffic information on these roads during construction of the BP3 and Keeyask Projects. During the summer of 2015, MI installed permanent traffic monitoring stations at Sites 1, 2 and 3. The installation of the permanent monitoring stations at Sites 10 and 11 was delayed until the fall of 2015 as there was ongoing road work underway in the area.

To create efficiencies and to have consistent monitoring and data outputs, all five monitoring locations were consolidated in late 2015 to have monitoring data compiled by MI on a monthly basis. Data from all five sites has been consistently collected since the fall of 2015.

Data Collection Processes

Traffic Volume Data

Monitoring Stations

On-going compilation of data from the five permanent monitoring stations is completed monthly by MI personnel. The data is reviewed and formatted then forwarded to MH. The induction loops are able to differentiate various vehicle types based upon axle count and spacing. Vehicle classifications have been grouped into small, medium and large vehicles as shown in **Figure 2**.



Figure 1 – Site 1 Traffic Monitoring Station

Site Gates

In addition to the physical traffic monitoring stations described above, security gates on the North Access Road and South Access Road into Keeyask and on the Conawapa Access Road into Keewatinohk are collecting data for all vehicles entering the sites. Security personnel located at the gates track the type (see **Figure 2**) and number of vehicles that enter and leave the sites.

Speed Data

The RCMP detachment in Gillam does occasional speed enforcement on PR 280 and PR 290. Data collected from these activities are obtained annually.

Speed is also calculated using the permanent traffic monitoring stations. The induction loops that are buried within the roadway are spaced at a given interval. The time it takes for the front axle and rear axle to cross the loops, gives an indication of the speed of the vehicle. This information is reflective of vehicle speed tendencies at the specific traffic monitoring station location. The specific location of the traffic monitoring station may impact the speed tendencies given it’s proximity to curves, intersections, etc in each direction.

Small vehicles are categorized as all passenger cars, trucks and vans. Medium vehicles are categorized as all buses and dual or tandem axle trucks. Large vehicles are categorized as all vehicles with five axles and more.




Bin 1	Class 1	Small	Cars, truck and vans
Bin 2	Class 2, 3, 4	Medium	Buses, single dual & tandem dual trucks, dual steering with tandem drive
Bin 3	Class 5 and 6	Large	Trucks 5 axles and up
Vehicle Category		Vehicle Description	
Small			
Medium			
Large			

Figure 2 - Vehicle Classification

Collision Data

Reported collision data is tracked by MPI. MPI is only able to log collisions that are reported and the details are limited to what is provided. In addition, the local RCMP detachment provides information on reported collisions. Collisions are defined as any reported accident that resulted in property damage or injury.

The collision data is compiled by MH annually and summarized in the following section.

Data Collection Results

Historic Data

Temporary Traffic Monitoring Stations

MI collects data on PR 280 and PR 290 on a biennial basis. Traffic counts are typically conducted for 48 hours each time via a pneumatic (compressed air) road tube-counter which counts vehicle axles. Traffic volume information was obtained from the MHTIS website for the years 2003, 2005, 2007, 2009, 2011, 2013 and 2015.

The data is used to estimate the annual average daily traffic (AADT) which is the number of vehicles passing a point on an average day of the year.

Traffic data from the MHTIS for PR 280 between PR 391 and the PR 280/PR 290 intersection is divided into two segments; PR 391 to Split Lake and Split Lake to the PR 280/PR 290 intersection. A third section of PR 280 is taken from the PR 280/PR 290 intersection to Gillam. Traffic data for PR 290 are from temporary counters located just east of PR 280 and west of Sundance.

Table 1 summarizes the AADT for the segments of PR 280 and PR 290 for the provided data years of 2003, 2005, 2007, 2009, 2011, 2013 and 2015 (rounded to the nearest five).

Table 1 – PR 280 & PR 290 Traffic Volumes

Highway	Segment	Annual Average Daily Traffic (AADT)						
		2003	2005	2007	2009	2011	2013	2015
PR 280	PR 391 to Split Lake	230	155	135	175	210	270	340
	Split Lake to PR 280/290	115	95	95	120	140	160	230
	PR 280/290 to Gillam	205	210	235	225	255	375	450
PR 290	East of PR 280	100	100	130	150	140	240	295
	West of Sundance	10	30	50	50	40	80	150

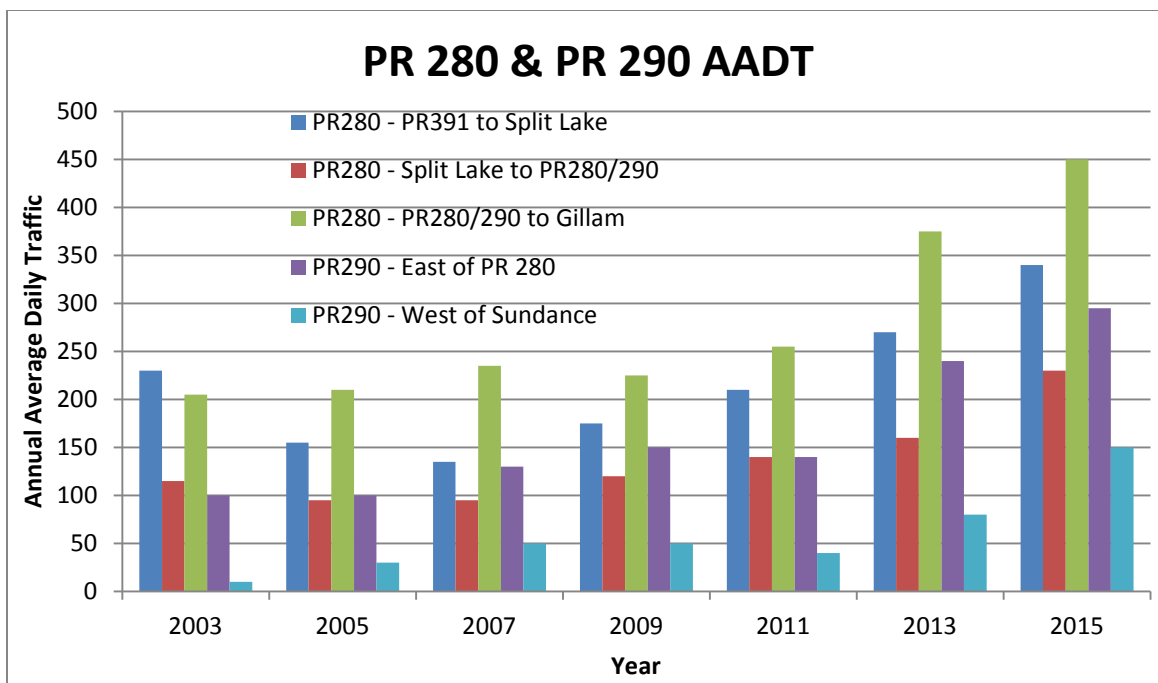


Figure 3 – PR 280 & PR 290 Traffic Volumes

Table 2 summarizes the two, four, six, eight, ten and twelve year growth rates for PR 280. Due to the small sample size on PR 290, growth rates would be skewed and are therefore not calculated for this section of roadway.

Table 2 – PR 280 Growth Rates

Highway	Segment	Growth Rates					
		2-year	4-year	6-year	8-year	10-year	12-year
PR 280	PR 391 to Split Lake	12.2%	12.8%	11.7%	12.2%	8.2%	3.3%
	Split Lake to PR 280/290	19.9%	13.2%	11.5%	11.7%	9.2%	5.9%
	PR 280/290 to Gillam	9.5%	15.3%	12.2%	8.5%	7.9%	6.8%

Current Data

Traffic Monitoring Stations

Data from the traffic monitoring stations indicates that there has been a steady increase in traffic volumes since the summer of 2015. Increases of 30% to 60% have been realized at all the stations. **Figures 4 and 5** show the traffic counts since mid-July, 2015. Monitoring stations 3, 10 and 11 did not begin counts until mid-October, 2015. There was a failure at Station 1 in November, 2015 that lasted two weeks, therefore these month's ADT were extrapolated based on the partial month's data collection.

Counts of 100 to 200 vehicles per day is considered a very low volume in comparison to other Manitoba highways. While increase percentages appear high, this equates to approximately 3 or 4 more vehicles per hour.

Monthly data for individual stations is available in **Appendix A**.

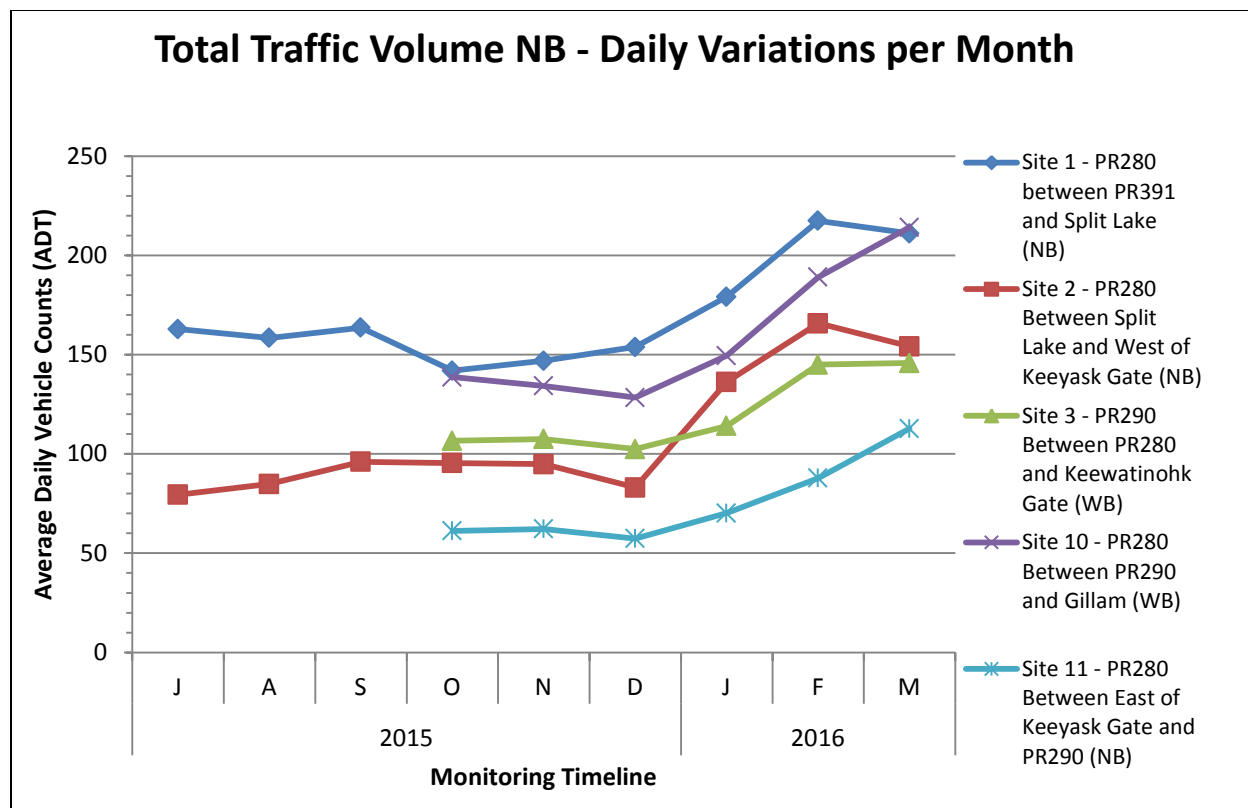


Figure 4 – Northbound Monthly Station Counts

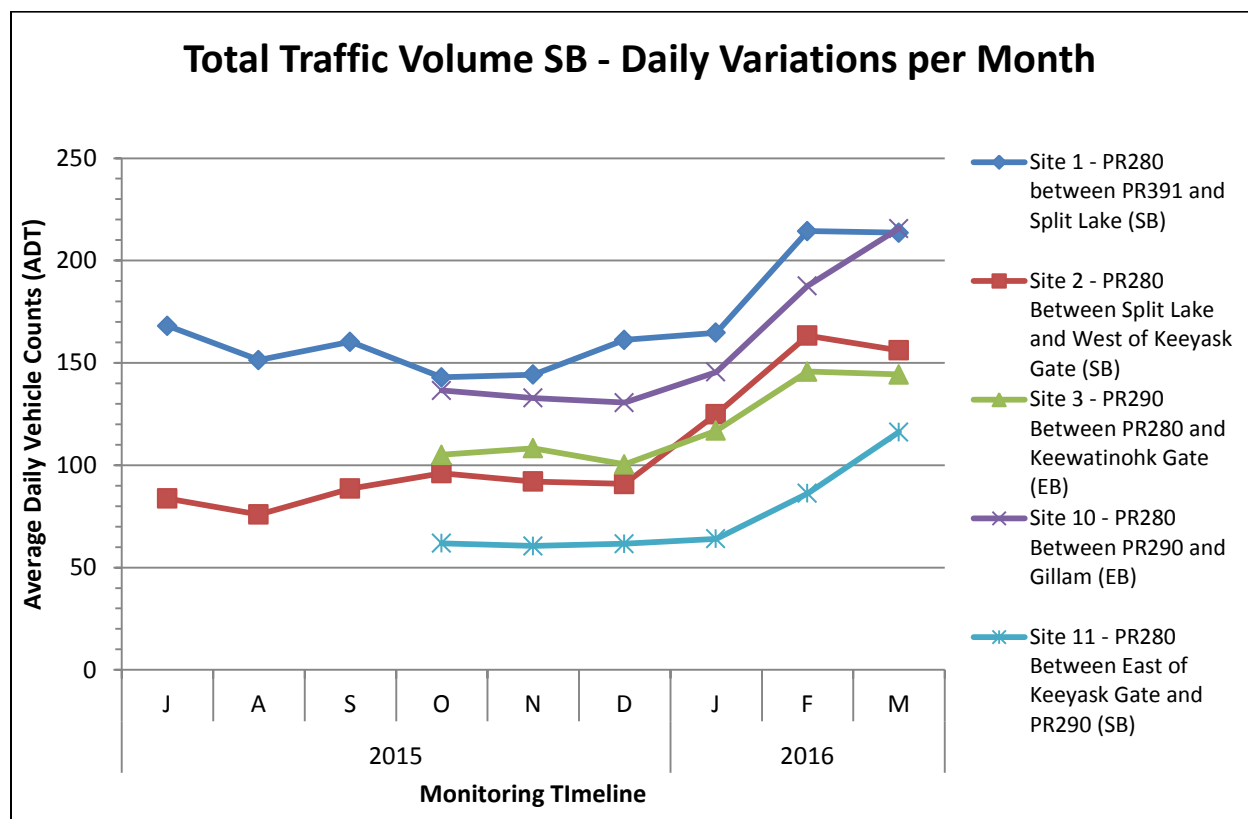


Figure 5 – Southbound Monthly Station Counts

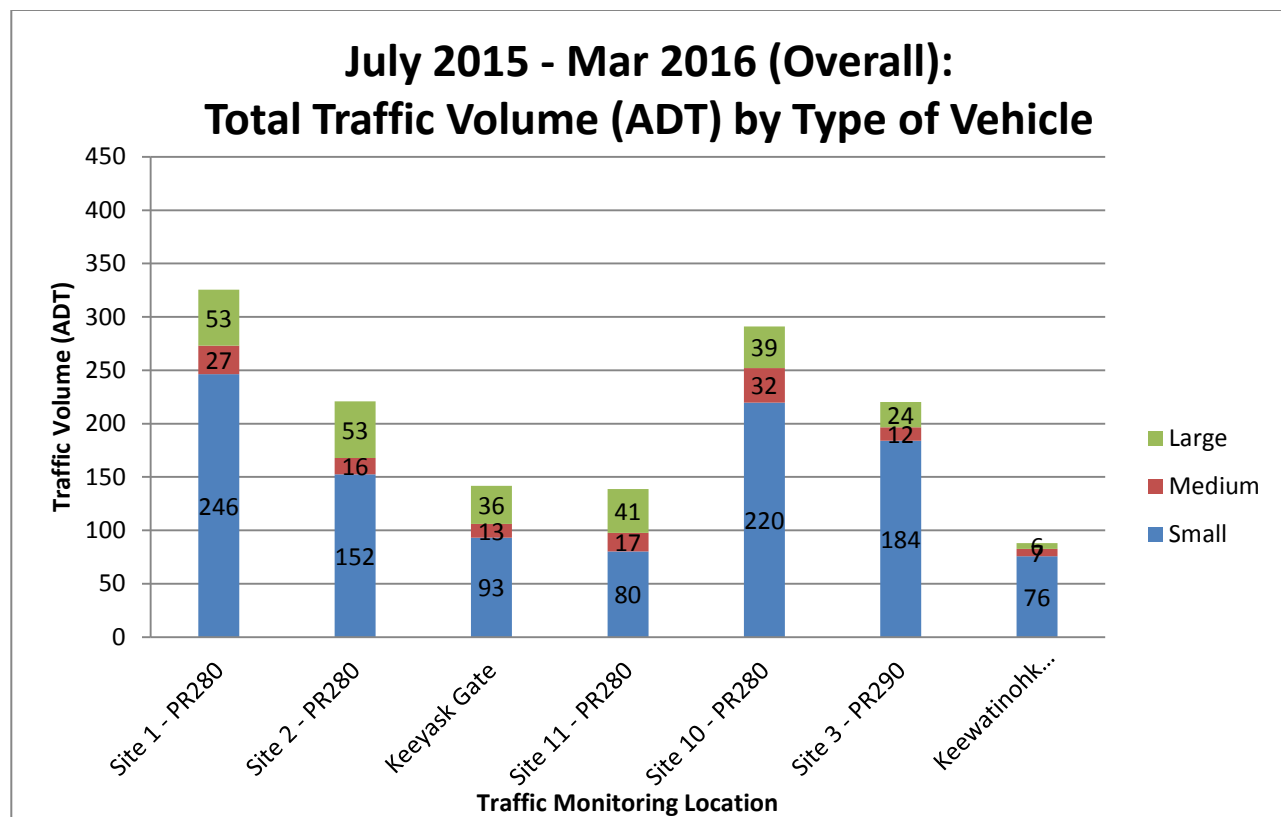


Figure 6 – Overall Total Traffic Volume by Type of Vehicle

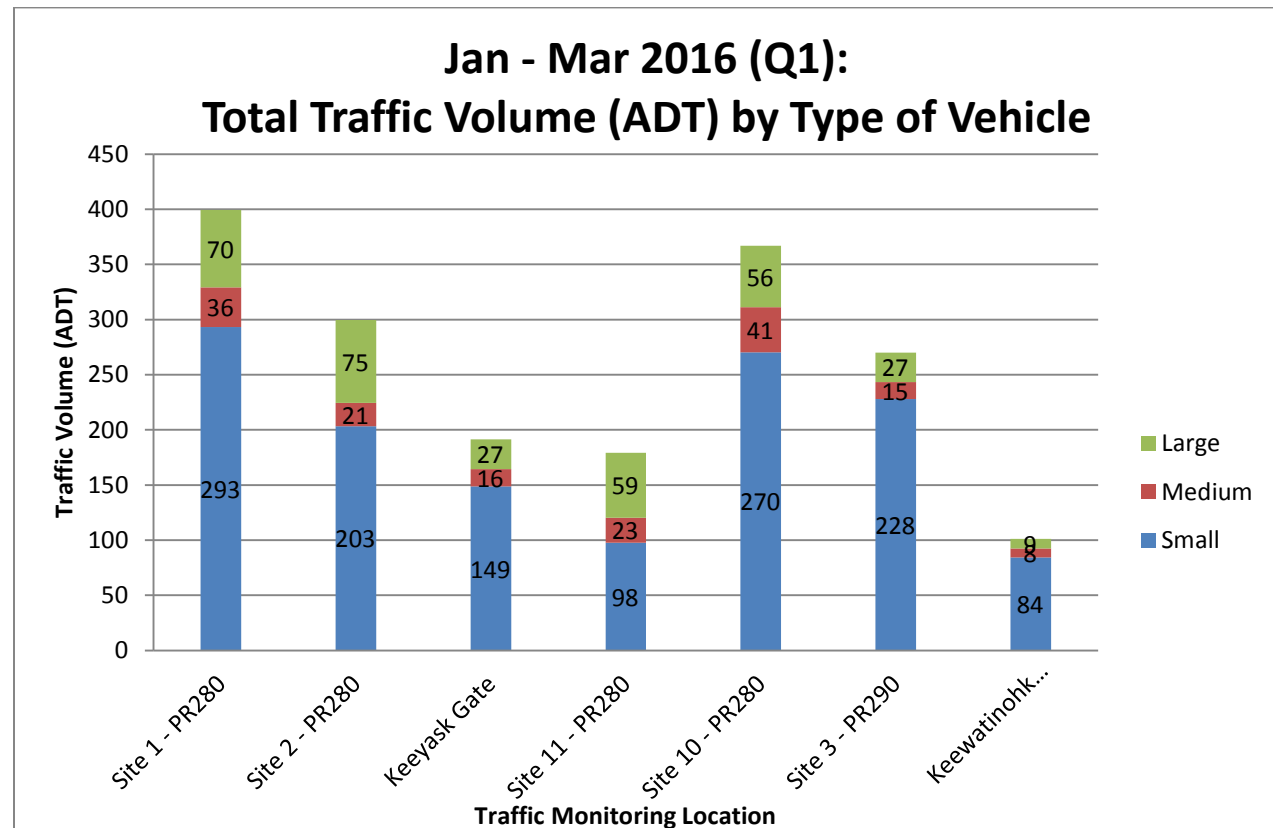


Figure 7 – Quarterly Total Traffic Volume by Type of Vehicle

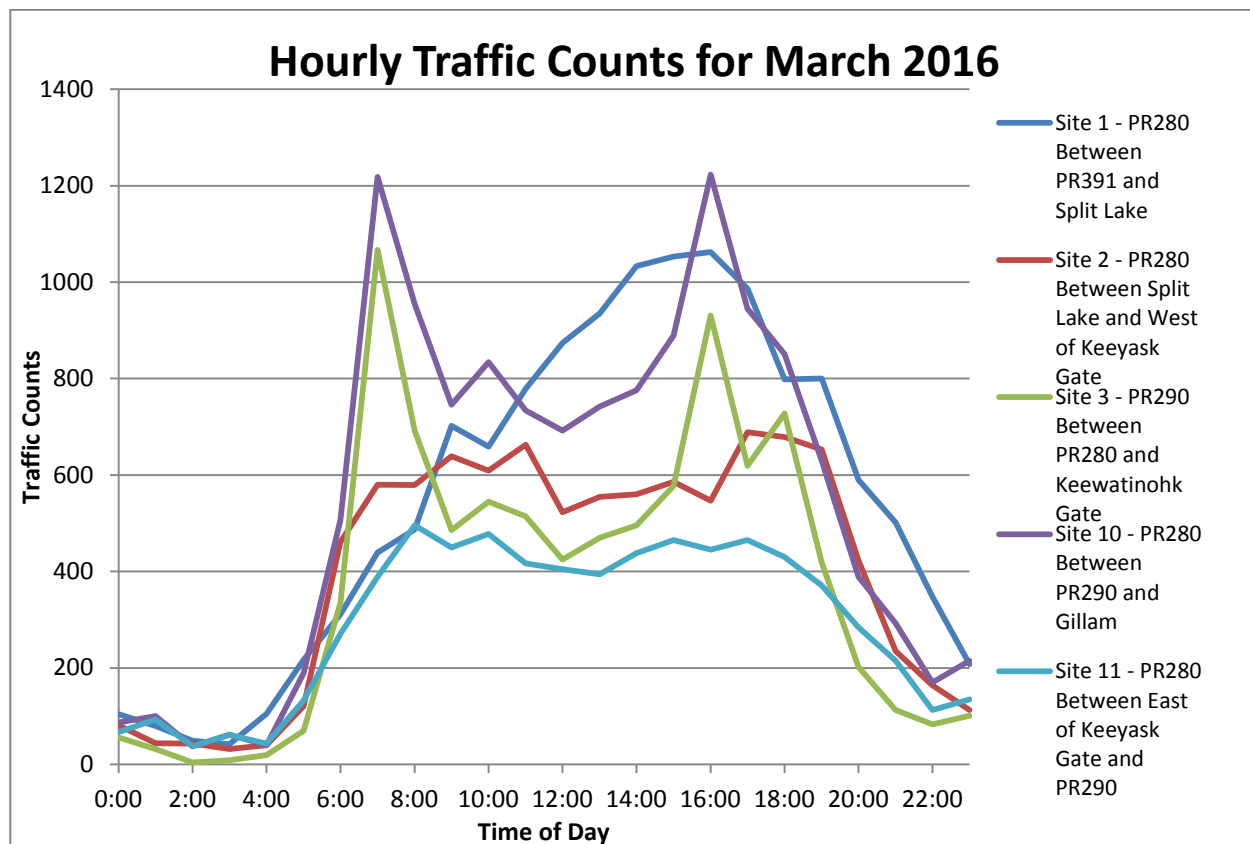


Figure 8 – March Hourly Traffic Counts

Speed Data

As mentioned earlier, the traffic monitoring stations are able to calculate the speed of a given vehicle that passes over the induction loops. The Gillam RCMP detachment have supplied data regarding traffic infractions but speed enforcement by the RCMP is sporadic and the data supplied by them cannot be considered representative of the conditions on PR 280 and PR 290.

It is apparent that speeding is prevalent, as indicated by **Figures 9 and 10** below. These graphs show the percentage of vehicles recorded exceeding the posted speed limit (>90km/hr) by the various traffic monitoring stations. **Figure 9** shows traffic conditions travelling in the direction of the sites, ie away from Thompson. **Figure 10** shows conditions of vehicles driving away from site, ie towards Thompson.

Total Percentage Vehicles Exceeding Posted Speed in North Directions

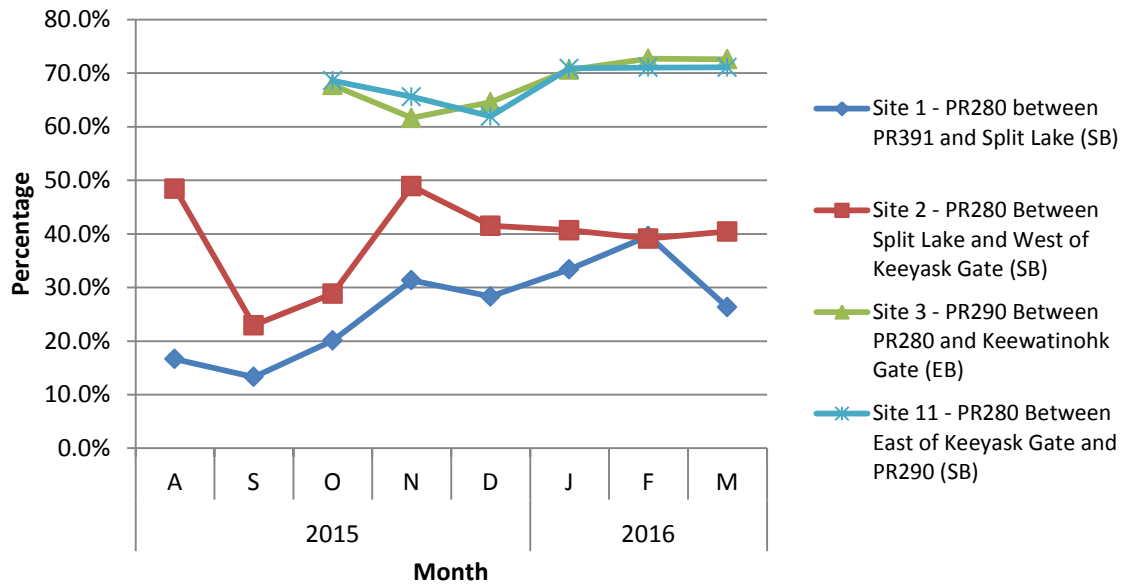


Figure 9 – Percentage of Vehicles Exceeding Posted Speed Northbound

Total Percentage Vehicles Exceeding Posted Speed in South Directions

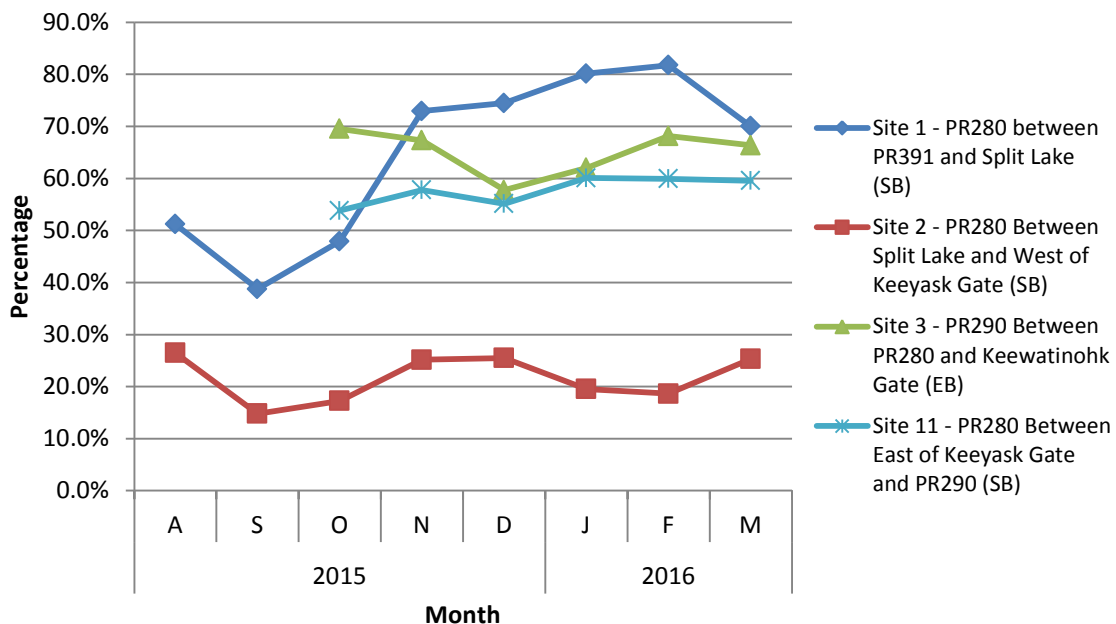


Figure 10 - Percentage of Vehicles Exceeding Posted Speed Southbound

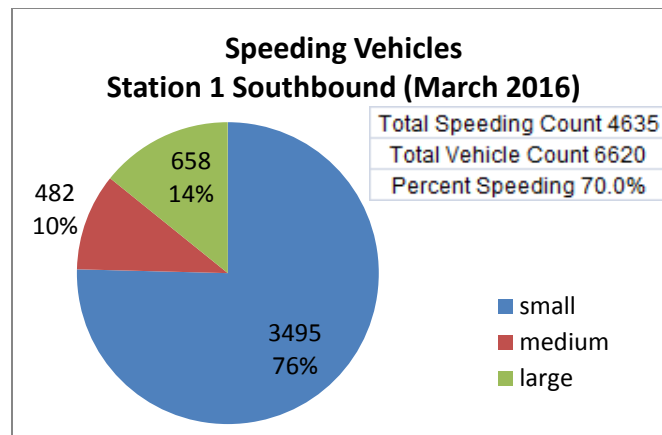
Speed data is influenced by the location of the monitoring stations and by driver comfort level. Comfort level is influenced by both road conditions and with driver familiarity of the roadway. Monitor locations give data related to that specific location only. Site 1 station shows higher speeding rates on “outbound” traffic compared to “inbound” traffic speeding rates. This is due to the monitoring station being in close proximity to the PR 391 intersection. Vehicles travelling east have not had time to speed up before crossing the monitoring station. This is similar to Site 2 but reversed directions. Site 10 is located at the curve on the north side of Long Spruce dam. Vehicles are either slowing down to navigate the curve onto the crossing or have just come out of the curve and are still speeding up. This is resulting in a negligible amount of vehicles exceeding the posted speed limit. For this reason, speed data for Site 10 was not included in the above graphs.

The percentage of vehicles exceeding the posted speed limit has been steadily increasing since the summer of 2015, which may be attributable to road improvements that have occurred over the past year as well as drivers familiarizing themselves with the roadway as they increase trip frequency. Speeding has been seen to increase during winter months which can be attributed to frozen road conditions which prevents gravel from being displaced and eliminates dust. Road improvements being a factor is also reflected in the vehicle type speed data. Earlier in 2015, the number of small vehicles that were speeding exceeded medium and large vehicles combined. However in recent months, both medium and large vehicle overall speeding rates have increased at Sites 3 and 11 where substantial road improvements have occurred.

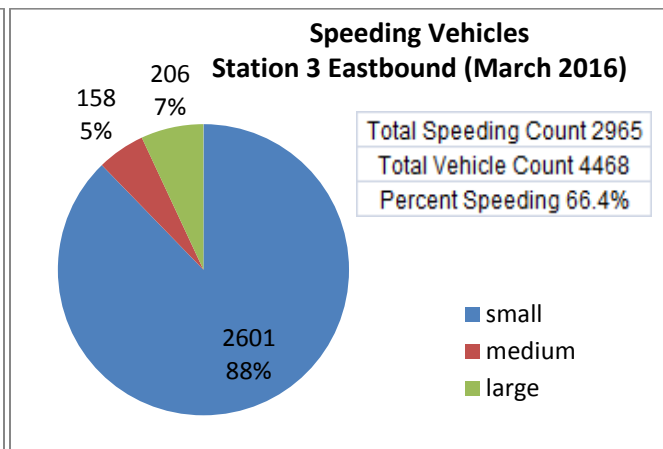
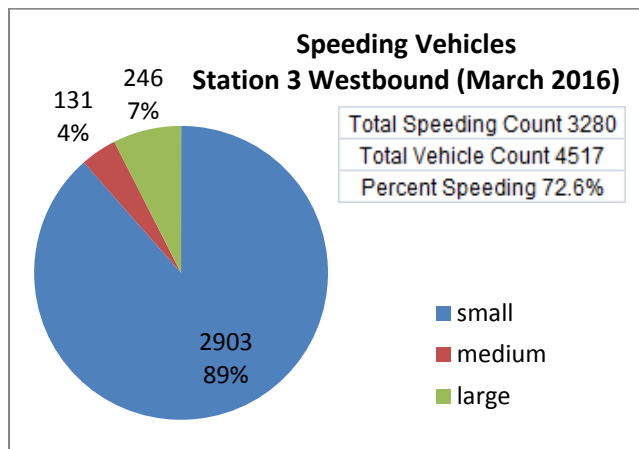
Table 3 – Average Vehicle Speeds

Station	Posted Speed	Average Speed (from July to Oct)			Average Speed (from Nov to March)		
		Small	Medium	Large	Small	Medium	Large
1 – PR280 between PR391 and Split Lake	90 - NB	78	71	67	86	82	76
	90 - SB	88	79	76	100	99	91
2 – PR280 between Split Lake and Keeyask	90 - NB	83	79	72	90	82	77
	90 - SB	79	72	68	79	72	71
3 – PR290 east of PR280/290 intersection	90 - WB	95	83	86	98	91	90
	90 - EB	95	95	91	95	92	88
11 – PR280 north of the PR280/290 intersection	90 - NB	98	96	90	97	96	88
	90 - SB	96	83	82	94	88	86

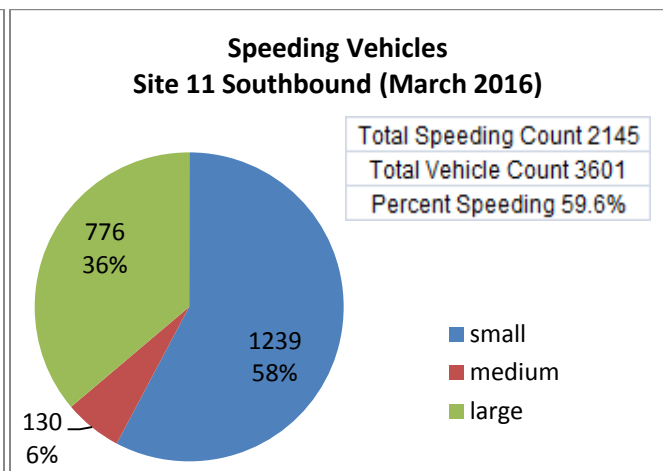
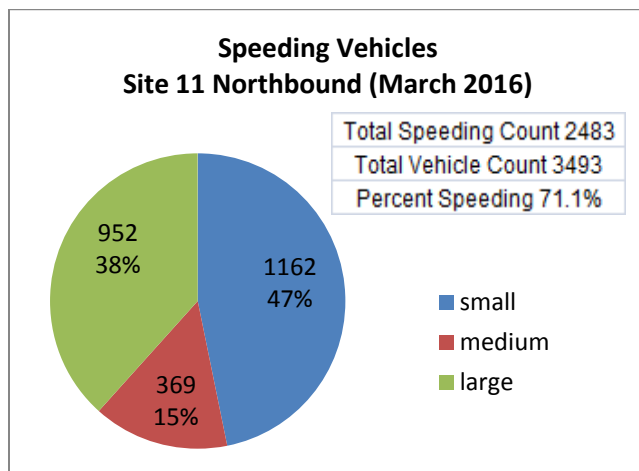
Speeding breakdown information is provided in Figure 11 for monitoring locations that are deemed to be representative of traffic conditions.



Station 1 – PR 280 between PR 391 and Split Lake



Station 3 – PR 290 between PR 280 and Keewatinohk Gate



Station 11 – PR 280 between East of Keeyask Gate and PR 290

Figure 11 – Breakdown of Speeding Vehicles at Various Sites in March 2016

Collision Data

Collision data for the years 2005 to 2015 was provided by Manitoba Public Insurance for PR 280 between PR 391 and Gillam. Prior to 2012, collision data was collected by the RCMP but has since been compiled by MPI. Collision trends by season are illustrated in **Figure 12**. Other collision related graphs are given in **Appendix B**. Collision severity and contributing factors for PR 280 are summarized in **Table 4**. The collision rate for PR 280 is summarized in **Table 5**.

Collision data for PR290 is very low with ranges from 0 collisions to a high of 2 collisions per year. For this reason, this data is not included in the following tables and graphs.

There were a total of 139 collisions on PR 280 between 2005 and 2015 an average of 12.6 collisions per year. Collisions during the spring (March, April and May) and fall (September, October and November) months were most frequent, accounting for 27 and 35 percent, respectively, of all collisions over the eleven-year period. Single vehicle collisions were most frequent, accounting for approximately 92 percent of all collisions during the analysis period.

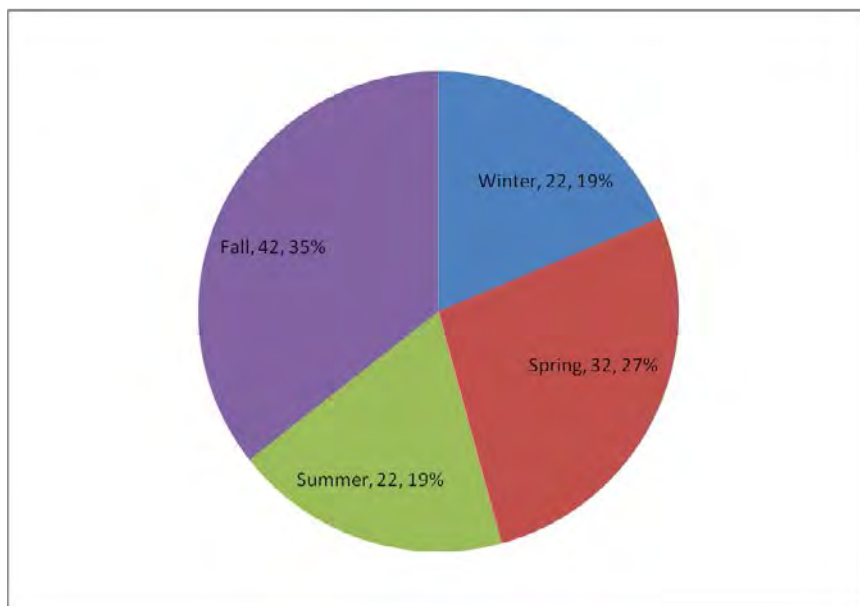


Figure 12 – PR 280 Collisions by Season

Table 4 – PR 280 Collision Severity and Contributing Factors

Year	Severity			Contributing Factor		
	Property Damage	Non-Fatal Injury	Fatality	Wildlife	Ran-off Road	Other/Unknown
2005	12	4	0	2	8	6
2006	11	6	0	3	13	1
2007	9	3	1	0	4	9
2008	6	2	0	1	4	3
2009	10	4	1	0	9	6
2010	8	1	0	1	3	5
2011	2	2	0	0	1	3
2012	2	0	0	0	1	1
2013	3	0	1	0	1	3
2014	21	4	0	6	3	16
2015	25	1	0	6	6	14
Total	109	27	3	19	53	67

The majority of collisions along PR 280 were property damage only, with 27 non-fatal injury collisions and three fatalities over the eleven-year analysis period. Running off the road was the cause in 38 percent of all collisions. Other factors, including collisions with other vehicles and overturning in the roadway accounted for approximately 48 percent of all reported collisions. Although the exact cause cannot be identified, running off the road collisions are typically caused by loss of control, fatigue, high speed along curved sections or attempting to avoid another vehicle or wildlife.

Collision rate is a measure of the risk faced by the road user and is based on the number of collisions that occurred and the volume of traffic on a roadway section during a specified period. Collision rate is measured as the number of collisions per million vehicle-kilometres of travel (MVKT) on a roadway section during the analysis period, which in this case is the eleven year period from 2005 to 2015. Traffic volumes used in calculating the collision rate are the average of the average annual daily traffic (AADT) volume recorded each year over the eleven year period. Average annual daily traffic volumes for PR 280 were only available from the Manitoba Highway Traffic Information System website for 2005, 2007, 2009, 2011, 2013 and 2015. Many agencies, including MI, consider road sections with collision rates exceeding 1.5 incidents per MVKT as warranting further review.

Based on the average annual daily traffic and the number of collisions for 2005, 2007, 2009, 2011, 2013 and 2015, PR 280 had an average collision rate of approximately 0.57 incidents per MVKT over the six study years. Due to the age and lack of detail of the collision data provided, it is difficult to determine any site specific conditions or locations associated with the collision information.

Table 5 – PR 280 Collision Rate

Year	Collision Rate (incidents per MVKT)
2005	0.86
2007	0.79
2009	0.82
2011	0.28
2013	0.14
2015	0.50
Average	0.57
MI Threshold	1.50

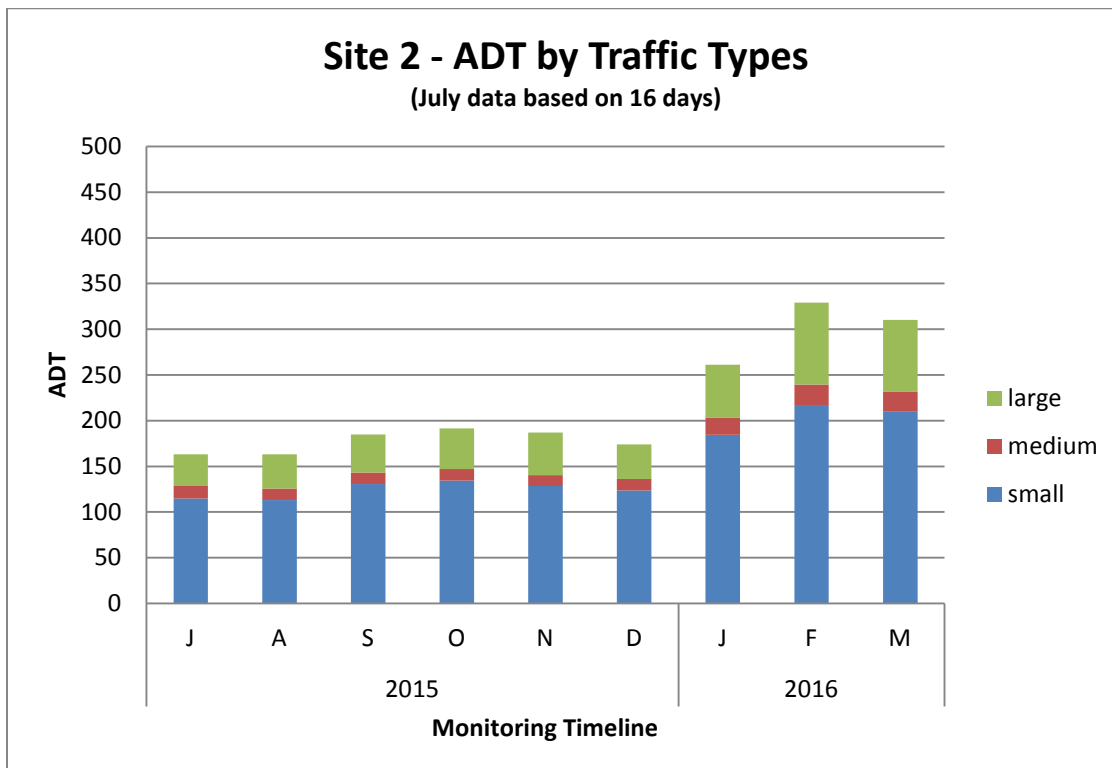
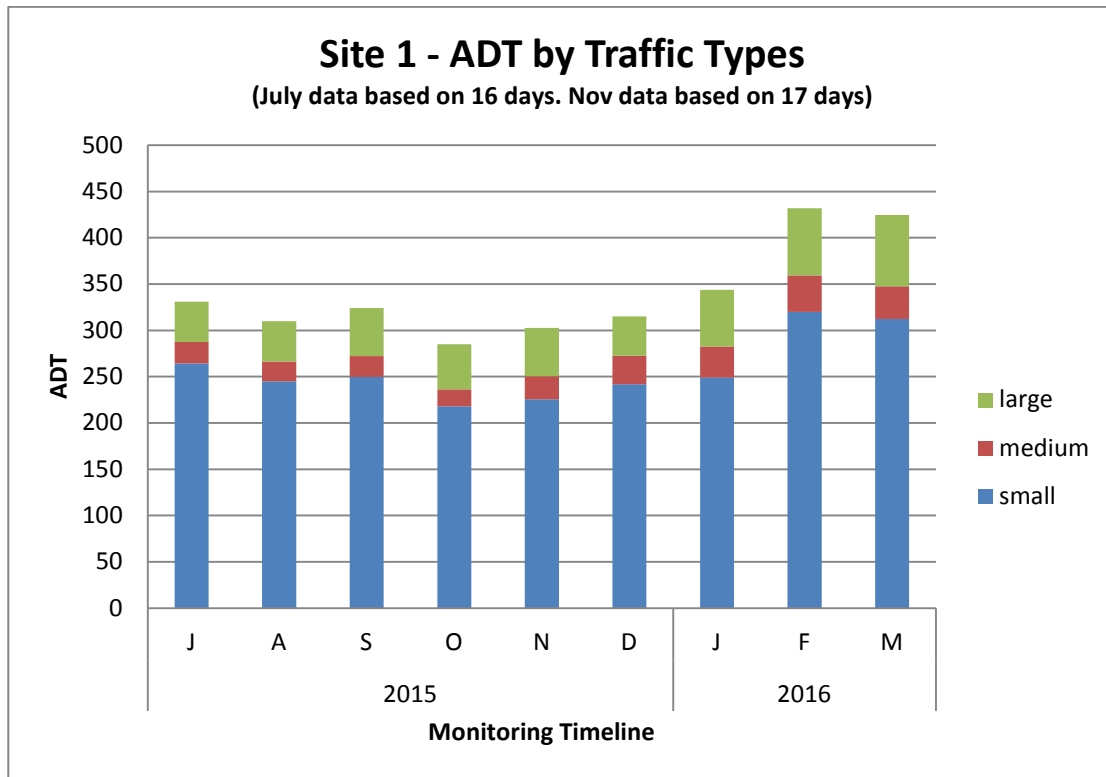
Results

Traffic volumes have been steadily increasing approximately 7%-12% per year over the past eight years on PR 280 and PR 290. Recent increases can be attributed to the increase in construction activity in the area. While traffic volumes have shown an increase of approximately 50% in that time frame, this increase is actually fairly low in terms of number of vehicles given the low volumes of traffic experienced on this road corridor. The increase in physical numbers of vehicles is not sufficient enough to warrant a review of the road geometry or design elements.

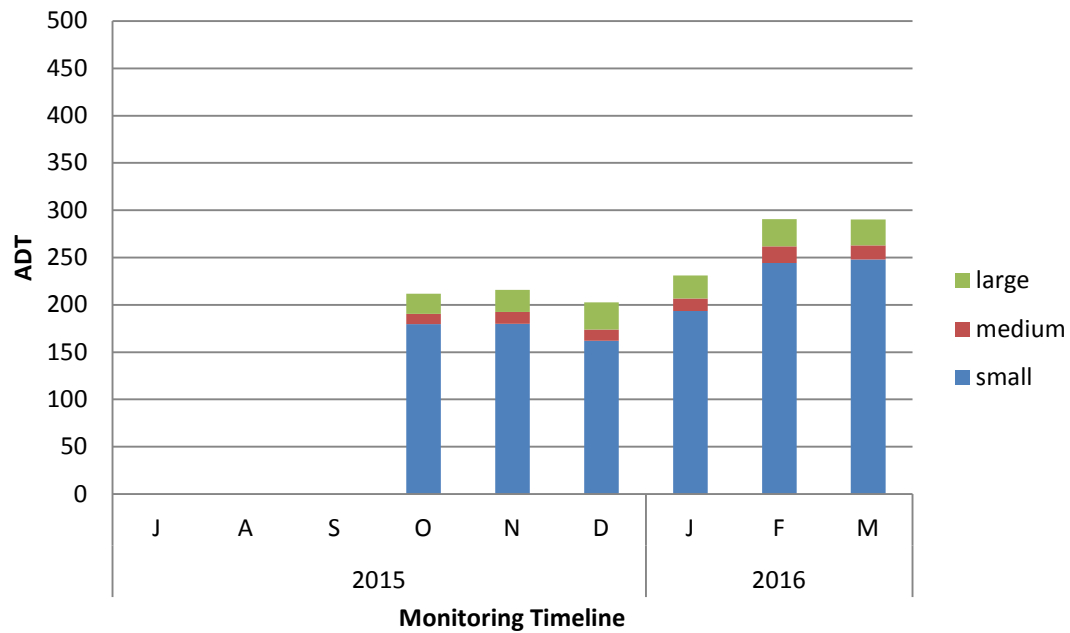
Data on vehicle speeds has only been collected since the fall of 2015. Additional data is required before trends can be observed however it is noted that the percentage of vehicles that are exceeding the posted speed limit through the monitoring stations has remained fairly constant throughout the monitoring period with the exception of when the roadway has been improved via construction works. Following road improvements, the percentage of vehicles exceeding the posted speed limit has increased slightly. Winter conditions have shown an increase in overall speeds of vehicles but this could be attributed to improved road conditions with frozen roadway, road improvements or a combination of both. Another season of data collection will be required to determine the reasoning.

Collision rates along the PR 280 and PR 290 corridors have remained below MI's allowable threshold of 1.50 MVKT. Collision rates are a factor of AADT, road length and reported collisions. With collision rates substantially below the allowable threshold, a road safety analysis is not required. Spot improvements and localized design considerations to address any concerns are ongoing and beneficial to an improved driving experience.

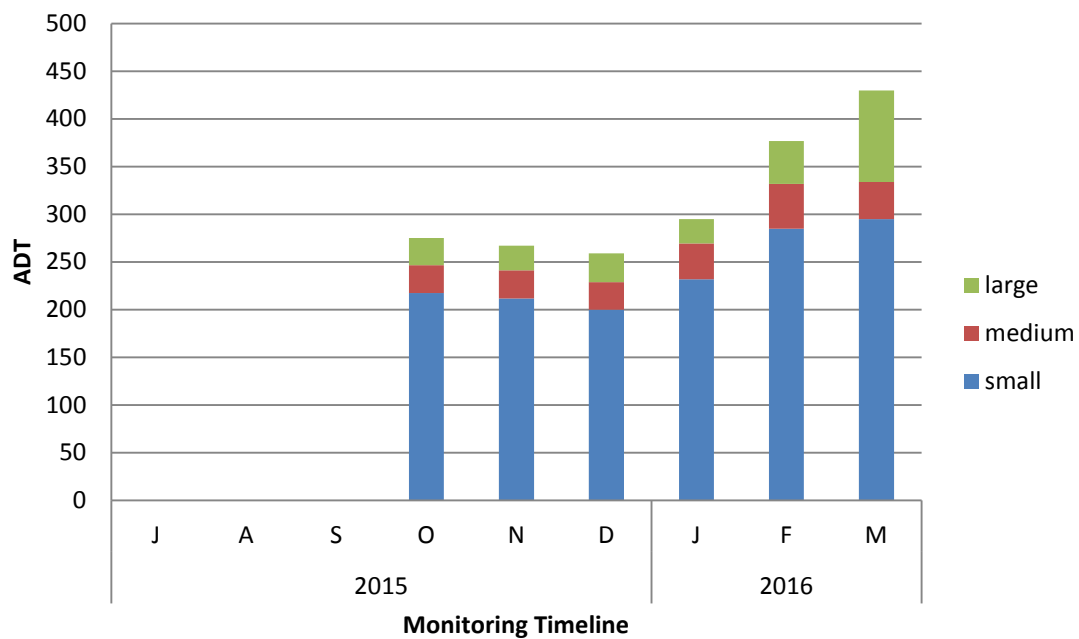
Appendix A – Monthly Traffic Counts



Site 3 - ADT by Traffic Types (October data based on 14 days)

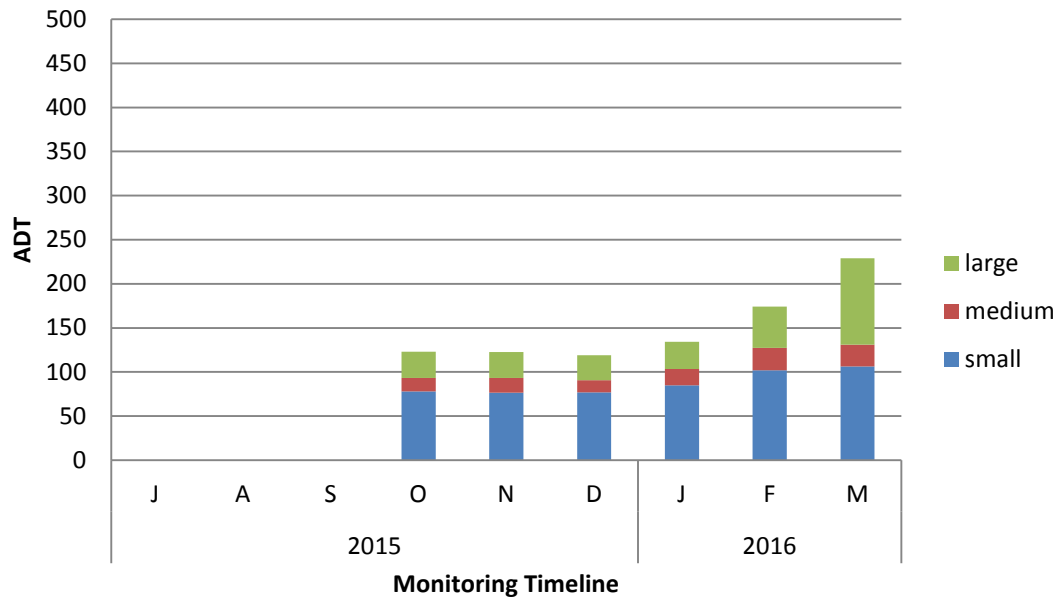


Site 10 - ADT by Traffic Types (October data based on 14 days)

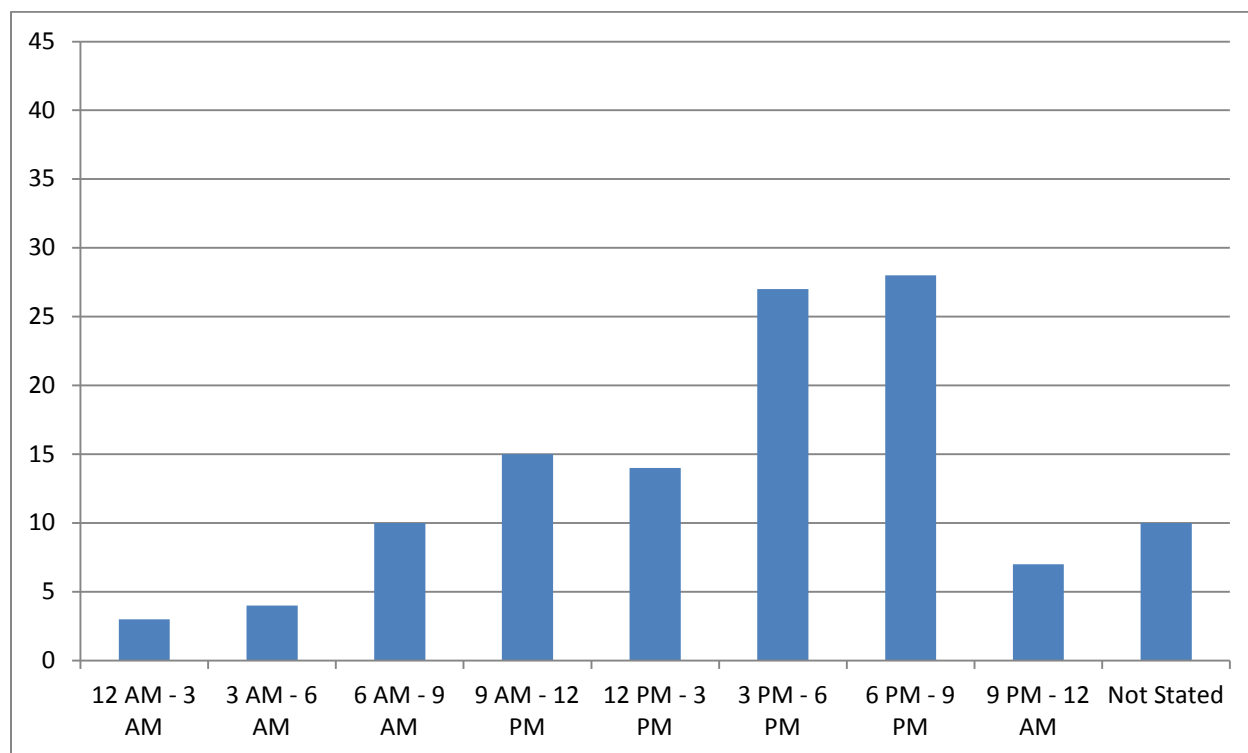


Site 11 - ADT by Traffic Types

(October data based on 14 days)

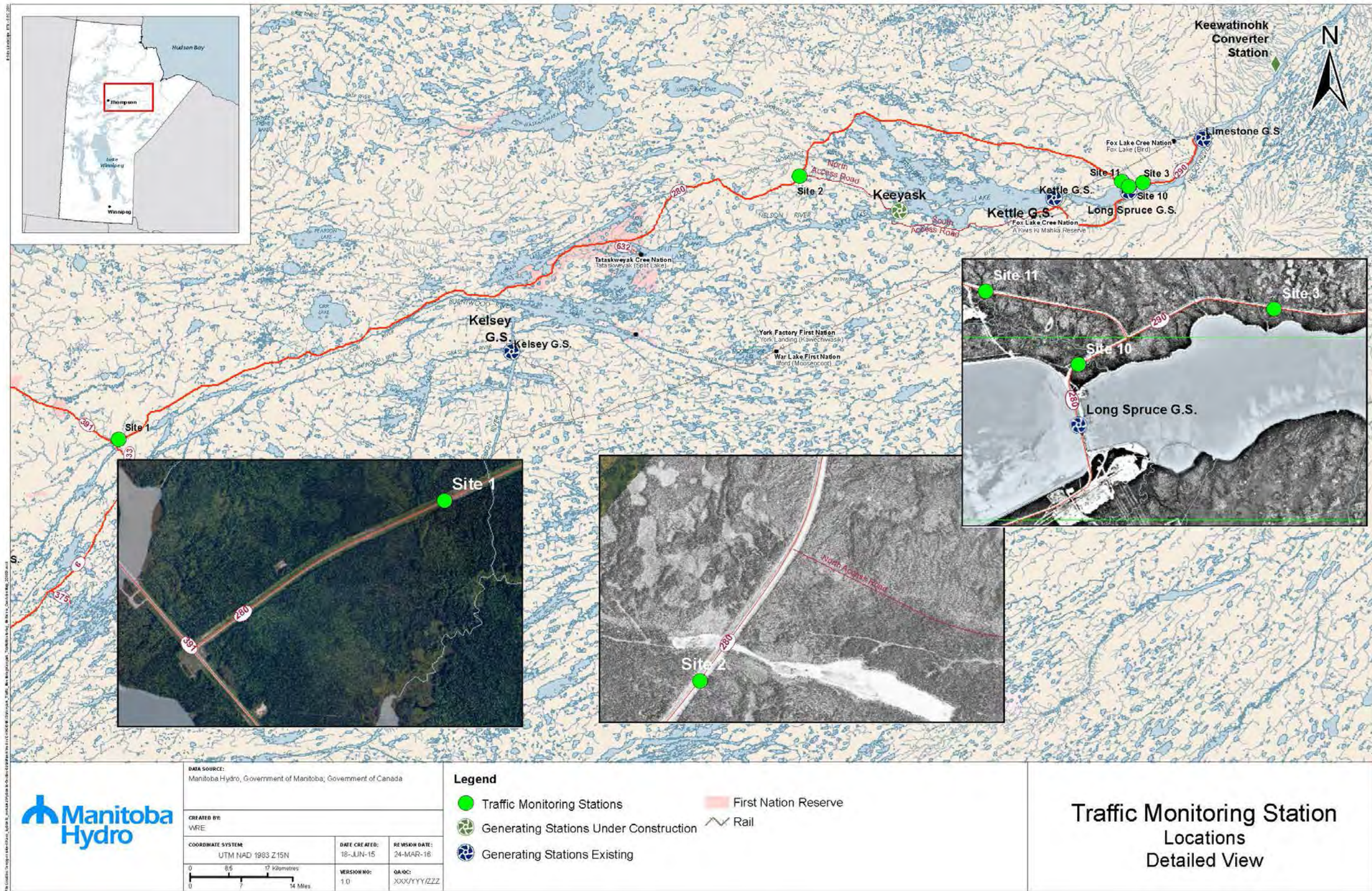


Appendix B – Collision Summary



PR 280 Collisions by Time of Day

Appendix C – Traffic Monitoring Locations





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