Transportation Plan of Nord-du-Québec

Technical Study

Overview of Safety in the Use of Off-Road Vehicles in Nord-du-Québec

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ACRONYMS

ATV	All-terrain vehicle
CRD	Conseil régional de développement
DSR	Diagnostic de sécurité routière (« Road security analysis »)
GÉTIC	Groupe d'études inuit et circumpolaires
MBJ	Municipalité de la Baie James
KRG	Kativik Regional Government
MTQ	Ministère des Transports du Québec
ORV	Off-road vehicle
PDO	Property damages only
SAAQ	Société de l'assurance automobile du Québec
SQ	Sûreté du Québec

NOTICE TO READER

Unless indicated otherwise by the context, the following expressions and words mean:

"Technical study"	**This technical study has no scientific pretence. It is not an opportunity study by any means, nor an exhaustive research on the subject. It aims at drawing up an overview of the situation in this specific area of transportation in Nord-du-Québec. Although the study is internal, the Ministère is nonetheless pleased to make it available to the reader.**
"Ministère"	**Ministère des Transports du Québec.**

In the text, words in italics are found in the glossary; except for laws, regulations and document titles.

SUMMARY

This technical study draws an overview of safety in the use of *off-road vehicles* (ORVs), more specifically snowmobiles and all-terrain vehicles (ATVs) in the Nord-du-Québec region (Region 10). It is part of the development process of the *Transportation Plan of Nord-du-Québec*. This safety overview is being completed using the database of accident reports from the Société de l'assurance automobile du Québec (SAAQ), for accidents that occurred between January 1, 1995 and December 31, 1999.

The Nord-du-Québec Region and the Lifestyle of its Inhabitants

Nord-du-Québec is the largest administrative region of Québec (840,000 km^2) with the least regional population: 39,467 inhabitants in 1997. The region comprises two territories: Nunavik, north of the 55^{th} parallel, and James Bay to the south (starting at the 49^{th} parallel).

Nunavik (9,251 inhabitants in 1997) is mostly inhabited by Inuits and the Whapmagoostui Crees. The 14 Inuit villages and the Cree village are not interlinked by road nor are they linked to Québec's southern road network. One of the main activities of Nunavik residents is subsistence harvesting (hunting, fishing and trapping). The arrival of snowmobiles and ATVs has substantially influenced the lifestyle. A great number of residents now use *off-road vehicles* (ORVs) as a first means of transportation.

As for the James Bay territory, it comprises the Cree lands as well as the Municipalité de la Baie James (MBJ) and the MBJ enclaved towns of Chibougamau, Chapais, Lebel-sur-Quévillon and Matagami. In the James Bay territory, the Crees live in eight villages (11,766 inhabitants in 1997) now linked to Québec' road network. They mostly use ORVs for utility purposes in traditional activities. They use them somewhat less than the Inuits however, taking into account their access to the road network and the fact that they own more road vehicles.

As for Jamesians, they live in the five cities andmunicipalities (18,450 inhabitants in 1997), comprising mostly non-Aboriginal persons who live there for their work. Jamesians mostly use snowmobiles and ATVs for recreational purposes.

The Use of Snowmobiles and All-Terrain Vehicles

The use of ORVs is very important in Nord-du-Québec. For MBJ and the enclaved towns, there is approximately one snowmobile per 5.3 residents and one ATV per 11.5 residents, which is much higher that in the rest of Québec (one snowmobile per 46.2 residents and one ATV per 44.8 residents). In Inuit and Cree territories, the ownership rate for snowmobiles and ATVs is probably higher; there is no reliable data to confirm this however (as some people do not have a license for their ORV).

Regional Overview of Safety for Snowmobiles and All-Terrain Vehicles

From 1995 to 1999, 248 snowmobile and ATV accidents occurred in the Nord-du-Québec region, 12 of which were *fatal*. This accident count is high with reference to the regional population, especially in Nunavik where one accident occurred per 75 residents over the last five years. We have to consider that the reported number of accidents is only part of the total number of accidents, since accidents are not always reported.

The majority of accidents (160 out of 248 accidents) took place on a *public road*, only 12 of those occurred on the MTQ road network. A road vehicle was involved in 37.5% of ORV accidents, while in 38.7% of cases, there was no other vehicle involved with the snowmobile or ATV.

Among drivers involved, most (55%) were 29 years old or less. Accidents mostly occurred in the afternoon. Snowmobile accidents occur most often in February and March while ATV accidents occur in June and September.

The accident factors most frequently reported were careless driving, excessive speed and impaired driving. The latter factor is more important in Nord-du-Québec than in Abitibi-Témiscamingue or in Québec as a whole.

Possible Causes of Accidents

Between 1995 and 1999, approximately 54% of accidents took place in populated areas. In the Inuit territory, this can be explained by the fact that residents are used to driving snowmobiles or ATVs in the streets of their village since these vehicles are the main mode of transportation. ORV traffic is also extensive in Cree villages, in MBJ and in the enclaved towns, although less so than among the Inuits. Jamesians generally drive through their communities to access snowmobile and ATV marked trails.

A great majority of accidents occur because drivers contravene safety rules.

In the absence of marked trails, traffic mostly runs on informal trails and *public roads*. Driving on informal trails can have an impact on safety (irregular surfaces, absence of signalization, etc.).

Severe weather conditions and a difficult terrain in Nord-du-Québec are factors that can influence safety in the use of ORVs, especially in the Inuit territory.

Courses of Action to Reinforce Safety

With regard to possible courses of action, the priority should be set on raising the awareness of snowmobile and ATV drivers in order to reduce the incidence of unsafe behaviour. The main issues to address are the following: impaired driving, speed driving by youth, risks specific to informal trails, dangers related to driving ATVs and snowmobiles on *public roads*.

During the MTQ consultations with the Nord-du-Québec population in 2000, there were repeated requests for the development of marked trails. It would be relevant for local and regional organizations to review the importance of building new marked trails.

If regulations eventually allow ORV traffic inside villages, the possibility of adapting the roads for a safe ORV traffic should be considered, with improved and adapted signalization for example.

Regional organizations such as the Kativik Regional Government, Cree Regional Authority, Conseils régionaux de développement and the Municipalité de la Baie James, can play a major role in the actions taken to ensure a safe use of ORVs. Locally, municipal administrations, along with police forces are also important stakeholders, particularly with the adoption of municipal by-laws on ORV traffic in the streets of villages. On their part, government authorities can support the communities.

The adoption of the *Off-road vehicles Act*[1], according to the wording of June 2001, would in fact recognize a certain specificity the northern region. However, the Government will have to ensure that the municipalities or villages adopt safety rules concerning ORV traffic inside villages.

1 *Off-Road Vehicles Act*, R.S.Q., c. V-1.2.

INTRODUCTION

This technical study draws an overview of safety associated with the use of *off-road vehicles* (all-terrain vehicles and snowmobiles) in the Nord-du-Québec region, and it is part of the development process of the *Transportation Plan of Nord-du-Québec*.

This description is based on the database of accident reports recorded by SAAQ, from January 1, 1995 to December 31, 1999. This overview allows to speculate on the causes of accidents, within the specific context of this northern region.

In the review of accident reports, all-terrain vehicles include three wheelers, four wheelers, motocross bikes and other types of vehicles allowing off-road traffic.

The report is divided in seven sections. The first one describes the territory as well as the local and regional context in Nord-du-Québec. The second section contains the data on the users, the ownership and the practice. The third section draws a regional overview of ORV safety by detailing the accident profiles (localization, number, severity, accident location, etc.). The fourth and fifth sections look at the possible causes for the accidents and compare accident profiles between Nord-du-Québec, Abitibi-Témiscamingue and Québec as a whole. As for section six, it contains a list of strengths and weaknesses related to ORV use and safety. The last section outlines a few courses of action to improve the safety of users. It should be noted that a study titled "*Véhicules hors-route: les responsabilités des intervenants, les réseaux et l'utilisation*" (*Off-Road Vehicles*: Responsibilities of Stakeholders, Networks and Utilization) is also available as a complement to this study.

1. REGIONAL CONTEXT IN NORD-DU-QUÉBEC

1.1 Description of the Territory under Study

Extending over some 840,000 square kilometres, the Nord-du-Québec region is the largest administrative region in Québec, covering more than half of the province (see Map 1).

This region is bordered to the west by Ontario, James Bay and Hudson Bay; to the north by the Hudson Strait and Ungava Bay; to the east by the Newfoundland-Labrador border and to the south-east by the limits of Côte-Nord, Saguenay–Lac-Saint-Jean and Mauricie administrative regions; and finally to the south by the 49th parallel, which is the administrative limit of Abitibi-Témiscamingue.

The region comprises two distinct territories: Nunavik, which lies north of the 55th parallel, and James Bay south of the 55th parallel.

In Nunavik, there are 14 Inuit municipalities, one Cree village, and an unorganized territory.

The James Bay territory includes the following:

- Municipalité de la Baie James (MBJ), comprising the localities of Valcanton and Villebois in the south, Radisson in the north and the hamlets of Miquelon and Desmaraisville;
- MBJ's four enclaved towns of Chapais, Chibougamau, Lebel-sur-Quévillon and Matagami;
- Eight of the nine Cree villages, since the Cree village of Whapmagoostui is located in Nunavik.

The Nord-du-Québec region is included in the *James Bay and Northern Québec Agreement*, which constitutes a treaty signed in 1975 by the Cree Nation, the Inuit Nation, the Government of Québec and the Government of Canada. The territory under agreement is divided in three categories of lands. Category I lands include the Cree and Inuit villages; these lands are for the exclusive use of the Crees and the Inuits. Surrounding Category I lands, Category II lands are Crown lands where Crees and Inuits hold exclusive hunting, fishing and trapping rights. Category III lands which are also Crown lands, cover the rest of the territory, except for MBJ enclaved localities and towns.

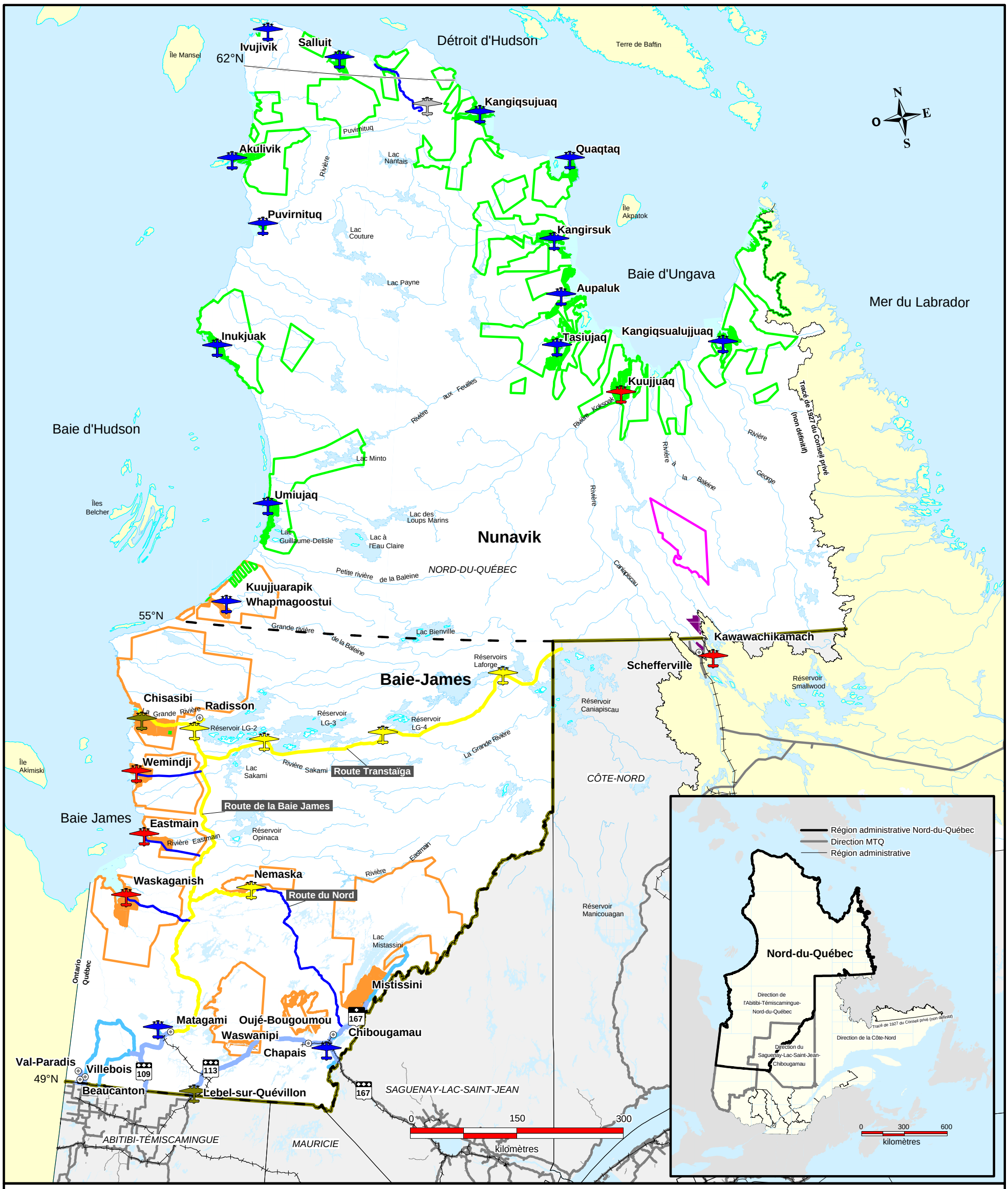
Part of the Nord-du-Québec region is not included in this study. It is the Naskapi lands of Category I-B (258 km^2) and II (4,150 km^2), located in Nunavik and covered by the *Northeastern Quebec Agreement* signed in 1978, which correspond to the lands of Kawawachikamach, the only Naskapi community in Canada.

Of the nine Cree villages, five are coastal and four are located inland. Only the Cree village of Whapmagoostui is isolated since it is not linked to the road network. As for the Inuit villages, they are all isolated and located on the coast or close to it.

1.2 Geographic Distribution of the Population

The Nord-du-Québec region covers a little more than half of Québec and accounts for 0.5% of its population. Table 1 shows the population distribution by municipality or village and by territory for the year 1997. The demographic data used to complete the analyses is from 1997, since it is the median year of the years for which accident reports were analysed (1995 to 1999) which is most representative.

MAP 1
TERRITORY UNDER STUDY



Transports Québec

Direction de la coordination du Nord-du-Québec

Map 1 : Territory under Study

Transportation Plan of Nord-du-Québec

Overview of Safety in the Use of Off-Road Vehicles in Nord-du-Québec

Source :
- Ministère des Transports du Québec

Basic map :
- Ministère des Ressources naturelles, digital maps, scale 1 : 250,000 and 1 : 8,000,000

May 2003

Land regime

(category I) (category II)

- Cree
- Inuit
- Naskapi

Note: The limits of the Oujé-Bougoumou territory are defined under the Cree-Québec Agreement of February 7, 2002.

Administrative limit

- Municipalité de la Baie James
- South limit Nord-du-Québec region
- Other Québec regions

Others

- Railway
- Town, village or locality

Road

Financial responsability

- MTQ - National, regional and collector
- MTQ - Access and mining
- MTQ - Other roads
- Hydro-Québec

Airport

Financial responsability

- Ministère des Transports
- Transports Canada
- Hydro-Québec
- Band council / Municipality
- Other

TABLE 1
POPULATION DISTRIBUTION IN NORD-DU-QUÉBEC, 1997

Territory	Municipality or Village	1997 Population
MBJ and Enclaved Towns	MBJ	1,812
	Chapais	2,061
	Chibougamau	8,791
	Lebel-sur-Quévillon	3,549
	Matagami	2,237
	Total	**18,450**
Cree Territory	Chisasibi	3,394
	Eastmain	549
	Mistissini	2,428
	Nemiscau	506
	Oujé-Bougoumou	498
	Waskaganish	1,597
	Waswanipi	1,156
	Wemindji	1,012
	Whapmagoostui	626
	Total	**11,766**
Inuit Territory	Akulivik	456
	Aupaluk	173
	Inukjuak	1,278
	Ivujivik	298
	Kangiqsualujjuaq	692
	Kangiqsujuaq	505
	Kangirsuk	401
	Kuujjuaq	1,877
	Kuujjuarapik	580
	Puvirnituq	1,235
	Quaqtaq	267
	Salluit	945
	Tasiujaq	216
	Umiujaq	328
	Total	**9,251**
	TOTAL	**39,467**

Source: Institut de la statistique du Québec, Direction de la méthodologie, de la démographie et des enquêtes spéciales. Internet address: http://www.stat.gouv.qc.ca/donstat/societe/demographie/dons_regnl/population/

Note: The demographic data is from 1997 because it is the median year of the years for which accident reports are analyzed (1995 to 1999).

Among the Crees, the communities of Chisasibi and Mistissini are the most populated, while among the Inuits, Kuujjuaq, Inukjuak and Puvirnituq are the most populated. Among the Jamesians, Chibougamau is the city with the largest number of residents followed by Lebel-sur-Quévillon.

For MBJ and the enclaved towns, it should be pointed out that population has decreased since the least ten years, probably due to the economic slowdown in the natural resources industry. MBJ and the enclaved towns used to account for more than 50% of the population in Region 10, and they represent now only 42%.

As far as Inuit and Cree populations are concerned, they are very young compared to the population in MBJ and enclaved towns. In 1996[2], 40.3% of residents in Inuit communities and 34.4% of residents in Cree villages were 14 years old or less, compared to 23.6% among Jamesians. It should be noted that from 1986 to 2001, the Inuit population showed a 60% increase.

2 The data on age was not available for our reference year (1997).

2. DATA ON USERS, OWNERSHIP AND PRACTICE

In spite of high purchase and maintenance costs, long delays for the delivery of parts and high gasoline costs[3], there is a significant use of *off-road vehicles* in Nord-du-Québec and all-terrain vehicle sales are consistently on the increase, at the expense of snowmobiles[4]. This is correlated by the evolution of the number of registered vehicles in Table 2.

Registered Vehicles

The registration data however probably does not portray the reality. In fact, if Jamesians generally register their ORVs, that is not the case for the Crees and the Inuits[5]. In 1993 for example, only five of the 3,249 snowmobiles and three of the 1,765 ATVs registered in Nord-du-Québec were in Nunavik. Thus, the registration data is only relevant to the situation in Jamesie. That is why Table 3 only deals with the ownership rate of snowmobiles and ATVs for Jamesians. It should be noted that there is no existing information on the number of unregistered vehicles in Québec.

TABLE 2
NUMBER OF SNOWMOBILES AND ATVS REGISTERED IN NORD-DU-QUÉBEC FROM 1995 TO 1999

Type of Vehicle	1995	1996	1997	1998	1999
Snowmobile	3,435	3,524	3,519	3,382	3,249
ATV	1,579	1,600	1,615	1,714	1,765
Total	**5,014**	**5,124**	**5,134**	**5,096**	**5,014**

Source: Statistics Canada, *1996 Census*, no. 93-357-XPB in the catalogue.
SAAQ, *Accidents, parc automobile, permis de conduire, bilan 1999.*

Ownership Rate

In 1997, the ORV ownership rate for MBJ and the enclaved towns was of one snowmobile per 5.3 residents, which is fairly higher than one snowmobile per 9.2 residents in Abitibi-Témiscamingue. As for ATVs, the rate for both regions is more similar, with one vehicle per 11.5 residents of MBJ and the enclaved towns and one per 12.9 residents in Abitibi-Témiscamingue.

TABLE 3
RATES OF SNOWMOBILE OR ATV OWNERSHIP FOR JAMES BAY AND FOR QUÉBEC IN 1997

3 Ministère des Transports du Québec, Direction de l'Abitibi-Témiscamingue–Nord-du-Québec, *Pre-Analysis*, *Transportation Plan of Nord-du-Québec*, June 2001, p. 24.
4 Groupe d'études inuit et circumpolaires (GÉTIC), Université Laval (May 2002), *Véhicules hors route : les responsabilités des intervenants, les réseaux et l'utilisation, Draft*, p. 1.
5 Ibid., p. 4.

Territory	Population 1997	Number of Snowmobiles 1997	Number of ATVs 1997	Rate of Snowmobile Ownership	Rate of ATV Ownership
MBJ and Enclaved Towns	18,450	3,497	1,609	1 PER 5.3 INHAB.	1 PER 11.5 INHAB.
Québec	7,302,553	157,905	162,892	1 PER 46.2 INHAB.	1 PER 44.8 INHAB.

Source: Bureau de la statistique du Québec, *Nord-du-Québec, Cahier 1: Population et logements*, p. 26.
SAAQ, *Accidents, parc automobile, permis de conduire, bilan 1997.*

For the Crees and the Inuits, the ownership rate is very high. Indeed, "almost all Aboriginal households own at least one snowmobile, and a majority also own an ATV"[6]. Based on these findings, Table 4 shows an approximation of the number of *off-road vehicles,* using a conservative scenario for the number of vehicles per household. The number of households is not available for the reference year (1997), this is why we have used 1996 data. It would be useful to validate this in the field to obtain a more reliable ORV number.

TABLE 4
APPROXIMATE NUMBER OF SNOWMOBILES AND ATVS IN THE CREE AND INUIT COMMUNITIES IN 1996

	Inuit Territory	Cree Territory
Number of Households 1996	2,139	2,463
Snowmobiles		
• Ownership rate per household	0.8	0.8
• Number of snowmobiles	1,711	1,970
• Number of residents per snowmobile	5.1	5.8
All-terrain Vehicles		
• Ownership rate per household	0.5	0.5
• Number of ATVs	1,070	1,232
• Number of residents per ATV	8.2	9.2

Source: Bureau de la statistique du Québec, *Nord-du-Québec, Cahier 1: Population et logements*, p. 26.
Note: The number of households per territory is not available for the reference year (1997). Because of this, 1996 data was used.

This estimate implies that the ownership rate of snowmobiles is similar for the three groups, but that the ATV ownership rate is higher in the Inuit and Cree villages than in the Jamesian municipalities.

The use of snowmobiles and all-terrain vehicles by the Crees and the Inuits has significantly impacted the practice of traditional activities according to the Groupe

6 Groupe d'études inuit et circumpolaires (GÉTIC), Université Laval (May 2002), *Véhicules hors route : les responsabilités des intervenants, les réseaux et l'utilisation,* Draft, p. 4.

d'études inuit et circumpolaires (GÉTIC), the hunting, fishing and trapping activities being dependant on modes of transportation, motorized *off-road vehicles* have become instruments of choice to reach traplines and bring back bush food.

Crees and Inuits start to drive *off-road vehicles* at a young age; since the majority of the population is less than 25 years of age, drivers are relatively young on average.

3. REGIONAL OVERVIEW OF SAFETY FOR SNOWMOBILES AND ALL-TERRAIN VEHICLES

3.1 Accident Profile

In this section, a general overview of accidents involving snowmobiles and all-terrain vehicles (ATVs) in Nord-du-Québec is drawn. This overview was prepared using the SAAQ's database on the accidents that occurred between January 1, 1995 and December 31, 1999.

The information recorded by the police officer in the accident report was compiled in a computerized database. MTQ has developed a software that allows for efficient processing of this data (DSR - Diagnostic de sécurité routière - “Road security analysis”). By extracting data from the database, it is possible to establish the accidents' main features.

The overview of safety concerns related to the use of snowmobiles and ATVs that is presented in this section only uses a sampling of all the accidents. Obviously, a great number of accidents were never reported. Moreover, the data from accidents involving joint reports is not available.

The validity of the data recorded in the accident reports is another element of caution, since numerous reports are incomplete or unclear.

3.1.1 Accident Localization

From 1995 to 1999, 248 snowmobile and ATV accidents in Nord-du-Québec were the subject of an accident report. From this number, only 12 took place on a road managed by MTQ, two of which were fatal. Ten of these 12 accidents involved a snowmobile and none happened at a snowmobile or ATV *passageway*.

TABLE 5
ACCIDENT LOCALIZATION IN NORD-DU-QUÉBEC ACCORDING TO THE ROAD NETWORK MANAGEMENT

Management	1995		1996		1997		1998		1999		Total	
	NB	%	NB	%	NB	%	NB	%	NB	%	NB	%
MTQ	2	4.2	4	7.3	2	4.5	0	0,0	4	9.8	12	4.8
Other networks	46	95.8	51	92.7	42	95.5	60	100.0	37	90.2	236	95.2
Total	**48**	**100.0**	**55**	**100.0**	**44**	**100.0**	**60**	**100.0**	**41**	**100.0**	**248**	**100.0**

Source: Accident reports involving a snowmobile or an all-terrain vehicle in Nord-du-Québec from January 1, 1995 to December 31, 1999.

3.1.2 Number and Severity of Accidents

Among the 248 accidents, 137 involved bodily injuries (55%). In most cases, the injuries were minor; however, 12 accidents involved fatal injuries and 54 accidents severe injuries. The following table indicates the severity of accidents for each year.

TABLE 6
NUMBER AND SEVERITY OF ORV ACCIDENTS IN NORD-DU-QUÉBEC, FROM 1995 TO1999

Severity	1995	1996	1997	1998	1999	Total	%
Fatal	2	4	3	1	2	12	4.8
Severe	12	12	3	13	14	54	21.8
Minor	14	16	14	23	4	71	28.6
Material Damage Only	20	23	24	23	21	111	44.8
Total	48	55	44	60	41	248	100.0

Source: Accident reports involving a snowmobile or an all-terrain vehicle in Nord-du-Québec from January 1,1995 to December 31, 1999.

During the five years, the number of reported accidents occurring each year ranged from 41 to 60, without any noticeable upward or downward trend.

3.1.3 Number and Severity of Accidents by Territory

Of the 248 reported accidents, 96 (38%) happened in MBJ or the enclaved towns, 29 (11.7%) in a Cree village and 123 (49.6%) in one of the 14 Inuit municipalities of Nunavik.

TABLE 7
NUMBER AND SEVERITY OF ORV ACCIDENTS, BY TERRITORY IN NORD-DU-QUÉBEC, FROM 1995 TO 1999

Territory	Fatal	%	Severe	%	Minor	%	MDO	%	Total	%
MBJ and Enclaved Towns	4	33.3	20	37.0	22	31.0	50	45.1	96	38.7
Cree	0	0.0	5	9.3	6	8.5	18	16.2	29	11.7
Inuit	8	66.7	29	53.7	43	60.5	43	38.7	123	49.6
Total	12	100.0	54	100.0	71	100.0	111	100.0	248	100.0

Source: Accident reports involving a snowmobile or an all-terrain vehicle in Nord-du-Québec from January 1, 1995 to December 31,1999.
MDO: Material damages only

Eight reported *fatal accidents* occurred in Inuit communities and four on the territory of the Municipalité de la Baie James. Five involved a snowmobile and seven an all-terrain vehicle.

The 54 *severe accidents* had 62 severely injured victims (see table below). They are distributed as follows, six among the Crees, 34 among the Inuits and 22 among the Jamesians. They involved a snowmobile in 33 cases and an ATV in 21 cases.

TABLE 8
NUMBER OF PERSONS SEVERELY INJURED IN ORV ACCIDENTS, BY TERRITORY, FROM 1995 TO 1999

Territory	Number of Severely Injured Persons
MBJ and Enclaved Towns	22
Cree	6
Inuit	34
Total	**62**

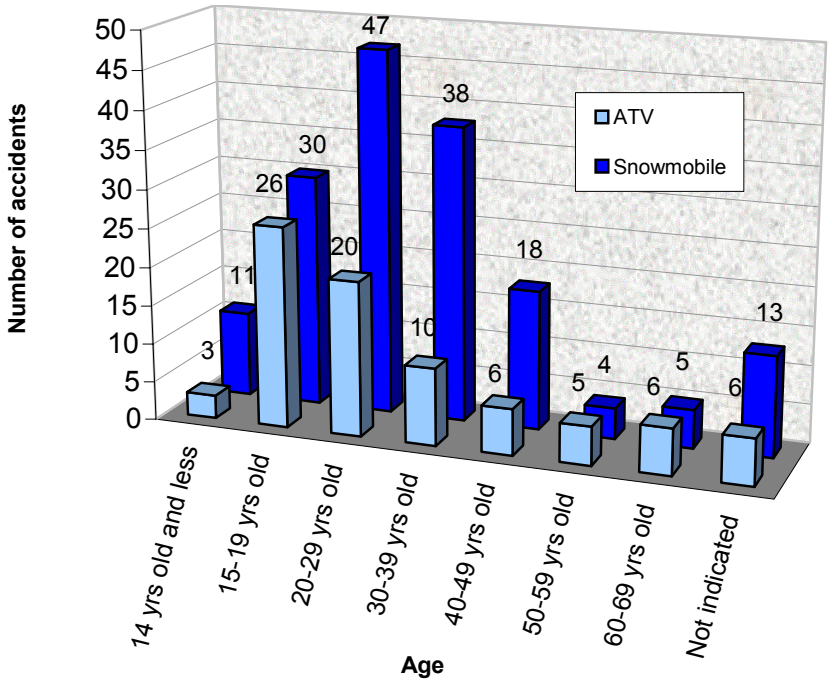
Source: Accident reports involving a snowmobile or an all-terrain vehicle in Nord-du-Québec from January 1, 1995 to December 31,1999.

3.1.4 Age of Persons Involved in the Accidents

As for the drivers' age, a ratio of 55% of drivers involved in a snowmobile or ATV accident were 29 years old or less, half of which were between 10 and 19 years old. These statistics are relatively representative of the population's age in Nord-du-Québec. There was only one case involving a driver less than 9 years old, but it was upsetting due to the fact that he was only two and a half years old!

Snowmobile accidents involved more young people 14 years old and less (6.7%) than ATV accidents (3.6%). The situation is reverse for the 15 to 19 age group. Indeed, the ratio of youth in this age group involved in an ATV accident is far more important than in snowmobile accidents. In fact, one third of all ATV accidents involved youth 15 to 19 years old.

FIGURE 1
AGE OF SNOWMOBILE AND ATV DRIVERS INVOLVED IN AN ACCIDENT IN NORD-DU-QUÉBEC FROM 1995 TO 1999



Source: Accident reports involving a snowmobile or an all-terrain vehicle in Nord-du-Québec from January 1, 1995 to December 31,1999.

3.1.5 Accident Location

Table 9 shows the location of accident according to the municipality or village. The number of reported accidents, in actual figures and in ratio, is lower in Cree territory and much higher in Inuit territory. This could be due to the fact that Cree villages are linked to the road network and there could be less ORV traffic. It is also possible that this situation reflects differences in behaviour and utilization according to the three locations; it could also result from different attitudes towards reporting or not reporting the accidents. It is possible that the 30 reported accidents for the entire Cree territory only represent a portion of the reality. For example, how could we explain the fact that the village of Whapmagoostui with 626 inhabitants, reports more accidents than Chisasibi (3,394 inhabitants) or Mistissini (2,428 inhabitants)?

It is interesting to compare Whapmagoostui to Kuujjuarapik, these two villages being immediate neighbours. With a population of 580 inhabitants (46 less than Whapmagoostui), Kuujjuarapik reported 3.5 times more accidents, that is 21 compared to six. There were two *fatal accidents* in Kuujjuarapik and five accidents with severely injured victims, compared to only one severely injured person in Whapmagoostui. Nevertheless, Whapmagoostui is the Cree community which reports the highest number of accidents, with one accident per 104 residents.

TABLE 9
LOCATION OF ACCIDENTS BY MUNICIPALITY OR VILLAGE

	Location	FATAL	%	SEVERE	%	MINOR	%	MDO	%	TOTAL	%
MBJ and Enclaved Towns	MBJ	4	33.3	11	20.4	10	14.1	10	9.0	35	14.1
	Chapais	0	0.0	3	5.6	1	1.4	6	5.5	10	4.0
	Chibougamau	0	0.0	3	5.6	8	11.3	20	18.0	31	12.5
	Lebel-sur-Quévillon	0	0.0	1	1.8	3	4.2	10	9.0	14	5.6
	Matagami	0	0.0	2	3.7	0	0.0	4	3.6	6	2.4
	Total	**4**	**33.3**	**20**	**37.1**	**22**	**31.0**	**50**	**45.1**	**96**	**38.6**
Cree Territory	Chisasibi	0	0.0	1	1.8	0	0.0	4	3.6	5	2.0
	Eastmain	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Mistissini	0	0.0	1	1.8	1	1.4	2	1.8	4	1.6
	Nemiscau	0	0.0	1	1.8	1	1.4	0	0.0	2	0.8
	Oujé-Bougoumou	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Waskaganish	0	0.0	0	0.0	1	1.4	3	2.7	4	1.6
	Waswanipi	0	0.0	0	0.0	0	0.0	3	2.7	3	1.2
	Wemindji	0	0.0	1	1.8	0	0.0	4	3.6	5	2.0
	Whapmagoostui	0	0.0	1	1.8	3	4.2	2	1.8	6	2.4
	Total	**0**	**0.0**	**5**	**9.0**	**6**	**8.4**	**18**	**16.2**	**29**	**11.6**
Inuit Territory	Akulivik	0	0.0	1	1.8	0	0.0	1	0.9	2	0.8
	Aupaluk	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Inukjuak	1	8.3	2	3.7	9	12.7	2	1.8	14	5.6
	Ivujivik	0	0.0	0	0.0	1	1.4	0	0.0	1	0.4
	Kangiqsualujjuaq	0	0.0	1	1.8	1	1.4	1	0.9	3	1.2
	Kangiqsujuaq	1	8.3	1	1.8	0	0.0	1	0.9	3	1.2
	Kangirsuk	0	0.0	2	3.7	1	1.4	4	3.6	7	2.8
	Kuujjuaq	3	25.0	14	25.9	18	25.4	23	20.7	58	23.4
	Kuujjuarapik	2	16.8	5	9.3	7	9.9	7	6.3	21	8.5
	Puvirnituq	0	0.0	0	0.0	0	0.0	1	0.9	1	0.4
	Quaqtaq	0	0.0	1	1.8	0	0.0	0	0.0	1	0.4
	Salluit	1	8.3	2	3.7	6	8.4	3	2.7	12	4.8
	Tasiujaq	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Umiujaq	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Total	**8**	**66.7**	**29**	**53.5**	**43**	**60.6**	**43**	**38.7**	**123**	**49.5**
	TOTAL	**12**	**100.0**	**54**	**100.0**	**71**	**100.0**	**111**	**100.0**	**248**	**100.0**

Source: Accident reports involving a snowmobile or an all-terrain vehicle in Nord-du-Québec from January 1, 1995 to December 31,1999.
MDO: Material damages only

3.1.6 Ratio of Residents per Accident

Table 10 helps to better understand the relative importance of accidents by municipality, giving the ratio of residents per reported accident. It appears that, with reference to the population, the number of accidents is considerable in Nunavik. Thus, from 1995 to 1999, this ratio was one accident per 75 residents in Nunavik (123 accidents for 9,251 residents), compared to one per 406 residents in the Cree communities (29 accidents for 11,766 residents). For the MBJ and enclaved towns, there was one accident per 192 residents (96 accidents for 18,450 residents). For the entire region of Nord-du-Québec, there is one reported accident per 159 residents on average.

A few municipalities have a noticeably low ratio (i.e. numerous accidents in relation to the population): Kuujjuarapik (28), Kuujjuaq (32), MBJ (52) and Kangirsuk (57). On the contrary, a few communities do not report any accidents: Mistissini, Oujé-Bougoumou, Aupaluk, Tasiujaq and Umiujaq. Others report only a few, particularly Puvirnituq and several Cree communities, which is surprising in light of their large populations.

.

TABLE 10
RATIO OF RESIDENTS PER ACCIDENT FOR NORD-DU-QUÉBEC, FROM 1995 TO 1999

	Location	Number of Inhabitants (1997)	Number of Accidents 1995-1999	Ratio of Inhabitants per Accident
MBJ and enclaved towns	MBJ	1,812	35	52
	Chapais	2,061	10	206
	Chibougamau	8,791	31	284
	Lebel-sur-Quévillon	3,549	14	254
	Matagami	2,237	6	373
	Total	**18,450**	**96**	**192**
Cree Territory	Chisasibi	3,394	5	679
	Eastmain	549	0	0
	Mistissini	2,428	4	607
	Nemiscau	506	2	253
	Oujé-Bougoumou	498	0	0
	Waskaganish	1,597	4	399
	Waswanipi	1,156	3	385
	Wemindji	1,012	5	202
	Whapmagoostui	626	6	104
	Total	**11,766**	**29**	**406**
Inuit Territory	Akulivik	456	2	228
	Aupaluk	173	0	0
	Inukjuak	1,278	14	91
	Ivujivik	298	1	298
	Kangiqsualujjuaq	692	3	231
	Kangiqsujuaq	505	3	168
	Kangirsuk	401	7	57
	Kuujjuaq	1,877	58	32
	Kuujjuarapik	580	21	28
	Puvirnituq	1,235	1	1,235
	Quaqtaq	267	1	267
	Salluit	945	12	79
	Tasiujaq	216	0	0
	Umiujaq	328	0	0
	Total	**9,251**	**123**	**75**
	TOTAL	**39,467**	**248**	**159**

Source: Accident reports involving a snowmobile or an all-terrain vehicle in Nord-du-Québec from January 1, 1995 to December 31,1999.

3.1.7 Road Type and Location of Accident

The type of road and/or the location where accidents occurred are listed in Table 11. The DSR database was used for the compilation, although it was necessary to process all accident reports manually in order to trace each accident to a type of road or location.

A clear majority of accidents (160 on 248 or 64.5%) occurred on a *public road* managed by MTQ, a municipality or another entity; the other accidents happened on a trail or in a parking lot.

TABLE 11
SNOWMOBILE AND ATV ACCIDENTS OCCURRING IN NORD-DU-QUÉBEC ACCORDING TO TYPE OF ROAD AND LOCATION SINCE 1995 TO 1999

Type of Road or Location	Number of Accidents	Ratio (%)
Municipal street	92	37.1
Trail (federated or not)	48	19.4
Road[a]	43	17.3
Parking lot	40	16.1
Forestry or mining road	13	5.3
Numbered road	10	4.0
Alley	2	0.8
Total	**248**	**100.0**

Source: Accident reports involving a snowmobile or an all-terrain vehicle in Nord-du-Québec from January 1, 1995 to December 31,1999.

a The "road" category mostly comprises accidents occurring on the access roads to the communities, on the roads to airports or on Hydro-Québec roads.

3.1.8 Type and Severity of Accidents

Table 12 shows the type of vehicles involved in snowmobile or ATV accidents in relation to their severity. A manual processing of the accident reports was necessary for information validation. The distribution is as follows: 38.7% of accidents did not involve any other vehicle nor pedestrian, while 37.5% involved a road vehicle (by order of importance: light truck, automobile, heavy truck, other truck, etc.). The other accidents involved two ORVs (13.7% of accidents) or an ORV and a pedestrian (8.1 % of accidents).

As for accidents causing severe injuries, 21 out of 54 involved another vehicle. In these 21 accidents, 28 persons were severely injured. It concerns a snowmobile in 15 cases and an ATV in 8 cases. We can assume the injured persons were all drivers or passengers of *off-road vehicles*, except maybe for the accidents involving a road vehicle where we ignore who was injured (although the risk of injury seems higher for ORV drivers and passengers than for road vehicle drivers).

TABLE 12
TYPE OF VEHICLES INVOLVED IN ACCIDENTS WITH A SNOWMOBILE OR AN ATV IN NORD-DU-QUÉBEC, FROM 1995 TO 1999

	Severity	Alone	Bus	School bus	Car	Others	Bicycle	Light truck	Truck (other than light)	Snowmobile	Not indicated	Pedestrian	All-terrain vehicle	Emergency vehicle	Machinery vehicle	Total	%
Snowmobile	Fatal	4	-	-	1	-	-	-	-	-	-	-	-	-	-	5	2.0
	Severe	13	-	-	5	-	-	4	2	5	-	4	-	-	-	33	13.3
	Minor	18	-	-	2	-	-	8	1	10	-	3	-	1	-	43	17.3
	MDO	18	1	1	23	-	-	20	4	11	3	1	2	-	1	85	34.3
	Sub-total	53	1	1	31	0	0	32	7	26	3	8	2	1	1	166	66.9
ATV	Fatal	5	-	-	-	-	-	-	-	-	-	1	-	-	1	7	2.8
	Severe	13	-	-	-	-	-	1	1	-	-	3	3	-	-	21	8.5
	Minor	17	-	-	-	-	1	1	2	-	-	6	1	-	-	28	11.3
	MDO	8	-	-	3	1	1	4	2	-	-	2	2	2	1	26	10.5
	Sub-total	43	0	0	3	1	2	6	5	0	0	12	6	2	2	82	33.1
	Total	**96**	**1**	**1**	**34**	**1**	**2**	**38**	**12**	**26**	**3**	**20**	**8**	**3**	**3**	**248**	**100.0**
	%	**38.7**	**0.4**	**0.4**	**13.7**	**0.4**	**0.8**	**15.3**	**4.9**	**10.5**	**1.2**	**8.1**	**3.2**	**1.2**	**1.2**	**100.0**	**-**

Source: Accident reports involving a snowmobile or an all-terrain vehicle in Nord-du-Québec from January 1, 1995 to December 31,1999.

3.1.9 Type of Accidents

Table 13 below indicates the type of accidents, showing for example, occurrences of collision with another vehicle or overturning. The information included in this section of the accident report depends on the interpretation of the police officer. Consequently, these figures must be interpreted with caution and considered as an order of magnitude rather than exact values.

Collisions with motor vehicles (all types of vehicles including ORVs) are the most frequent types of accidents, followed by overturning. Of the 119 recorded accidents involving a motor vehicle, 94 are snowmobile accidents and 25 are ATV accidents.

Overturning is the second most frequent type of accidents, with 39. It is much more frequent for ATVs to overturn (27 of 82 accidents or 33%) than for snowmobiles (12 of 166 accidents or 7%).

Accidents involving a pedestrian come in third for the type of accidents. Of the 20 accidents involving a pedestrian, 8 concerned snowmobiles and 12 concerned ATVs. This type of accident is somewhat more frequent among the Crees and the Inuits, probably because ORVs are used on *public roads* in the Aboriginal villages.

TABLE 13
TYPE OF SNOWMOBILE OR ATV ACCIDENTS BY TERRITORY

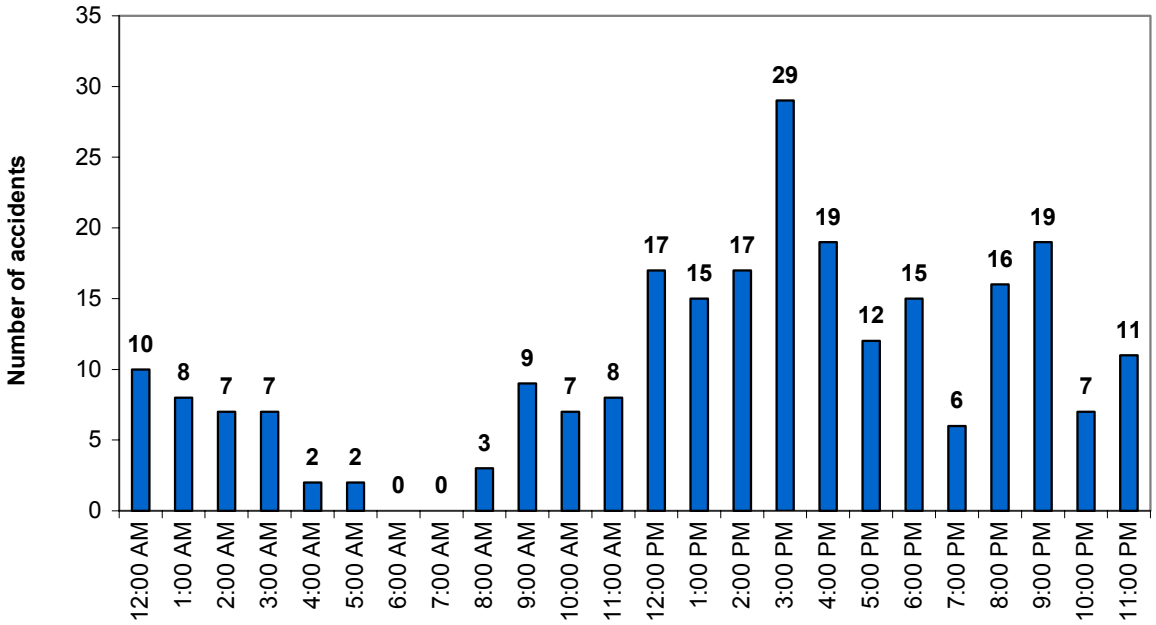
Type	MBJ and Enclaved Towns		Cree Territory		Inuit Territory		Total	
	NB	%	NB	%	NB	%	NB	%
Motor vehicles (truck, ORV, etc.)	44	45.8	18	62.2	57	46.4	119	48.0
Overturning	18	18.8	1	3.4	20	16.3	39	15.7
Pedestrian	1	1.0	4	13.8	15	12.2	20	8.1
Lost control	7	7.3	0	0	3	2.4	10	4.1
Streetlight/post	3	3.1	1	3.4	3	2.4	7	2.8
Tree	4	4.2	0	0	2	1.6	6	2.4
Other without collision	3	3.1	0	0	3	2.4	6	2.4
Not indicated	2	2.1	0	0	3	2.4	5	2.0
Non motorized	0	0	0	0	3	2.4	3	1.2
Fire/explosion	3	3.1	0	0	0	0	3	1.2
Temporary obstacle	1	1.0	0	0	2	1.7	3	1.2
Curb	0	0	0	0	2	1.7	2	0.8
Other: collisions or fixed objects	10	10.4	5	17.2	10	8.1	25	10.1
Total	96	100.0	29	100.0	123	100.0	248	100.0

Source: Accident reports involving a snowmobile or an all-terrain vehicle in Nord-du-Québec from January 1, 1995 to December 31,1999.

3.1.10 Time of Accident

The following figure indicates the time when the accidents took place. The afternoon is the time when most accidents happen, more precisely around 3:00 p.m. There are also a certain number of accidents between 8:00 p.m. and 9:59 p.m.; although at a lower ratio than what has been observed in Abitibi-Témiscamingue between 8:00 p.m. and 8:59 p.m.[7]. There are fewer accidents during the night, particularly between 4:00 a.m. and 8:59 a.m.

FIGURE 2
TIME OF SNOWMOBILE AND ATV ACCIDENTS



Source: Accident reports involving a snowmobile or an all-terrain vehicle in Nord-du-Québec from January 1, 1995 to December 31,1999.

3.1.11 Lighting Level

More than half of the accidents occurred during daylight (131 or 53%), while 17 happened at half-light. As for accidents during the night, 55 occurred on lighted roads and 44 in unlighted areas. For the latter accidents, the review of factors that caused them did not give any indication that the absence of light was an important factor.

7 Ministère des Transports, Direction de l'Abitibi-Témiscamingue–Nord-du-Québec, *Portrait de la sécurité liée à l'utilisation de la motoneige et des véhicules tout-terrain in Abitibi-Témiscamingue*, p. 37.

TABLE 14
NUMBER OF ORV ACCIDENTS OCCURRING IN NORD-DU-QUÉBEC ACCORDING TO LIGHTING, FROM 1995 TO 1999

		Number of Accidents	Ratio (%)
Day	Daylight	131	52.8
	Half-light	17	6.9
Night	Lighted road	55	22.2
	Unlighted road	44	17.7
	Not indicated	1	0.4
	Total	**248**	**100.0**

Source: Accident reports involving a snowmobile or an all-terrain vehicle in Nord-du-Québec from January 1, 1995 to December 31,1999.

3.1.12 Weather Conditions

Almost two-thirds of the accidents took place during clear weather (65.7%), 19.8% in cloudy conditions and 8.1% in snowy conditions (the other accidents occurred in other circumstances). The review of factors that caused the accidents indicates that obstruction to vision and glare were the main factor in eight accidents, five of which in clear weather, two occurred in drifting snow or snow storm conditions and one in cloudy/dark conditions. Thus, reduced visibility during snowstorms does not appear to be an important accident factor.

TABLE 15
NUMBER OF ORV ACCIDENTS OCCURRING IN NORD-DU-QUÉBEC ACCORDING TO WEATHER CONDITIONS FROM 1995 TO 1999

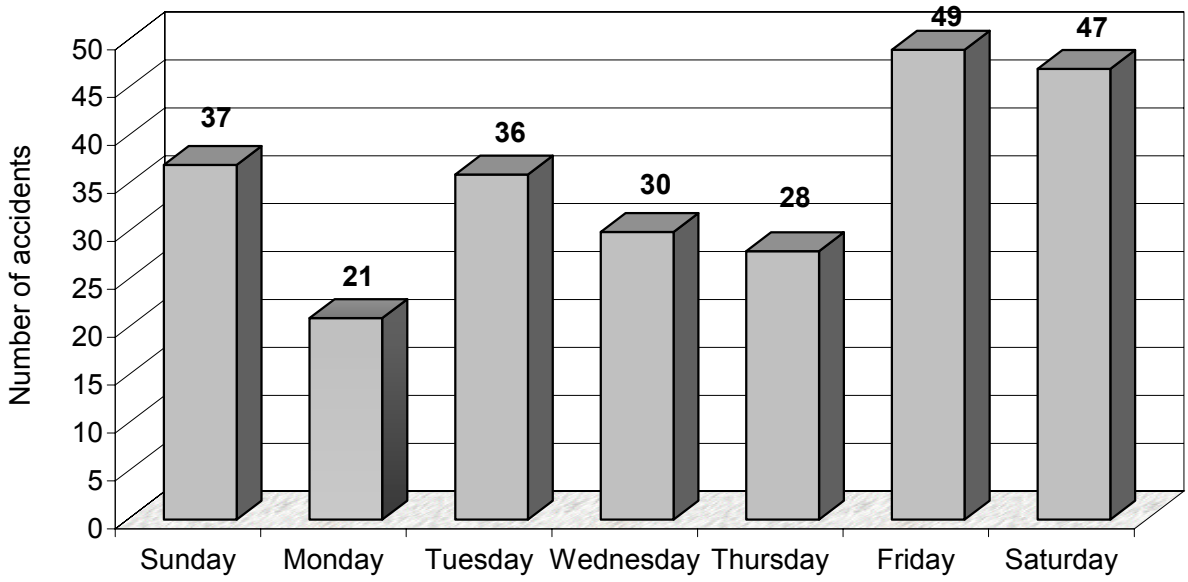
Weather Conditions	Number of Accidents	Ratio (%)
Clear	163	65.7
Cloudy	49	19.8
Snow/hail	20	8.1
Drifting snow/snow storm	6	2.4
Rain/drizzle	5	2.0
Ice storm	1	0.4
Fog/mist	1	0.4
Showers	0	0.0
Strong wind	0	0.0
Other	0	0.0
Not indicated	3	1.2
TOTAL	**248**	**100.0**

Source: Accident reports involving a snowmobile or an all-terrain vehicle in Nord-du-Québec from January 1, 1995 to December 31,1999.

3.1.13 Day of Accident

Accidents are more frequent during the weekend (Friday to Sunday) than during other days of the week. The following figure shows the distribution of accidents according to the day of the week.

FIGURE 3
DISTRIBUTION OF ORV ACCIDENTS IN NORD-DU-QUÉBEC ACCORDING TO THE DAY OF THE WEEK, FROM 1995 TO 1999

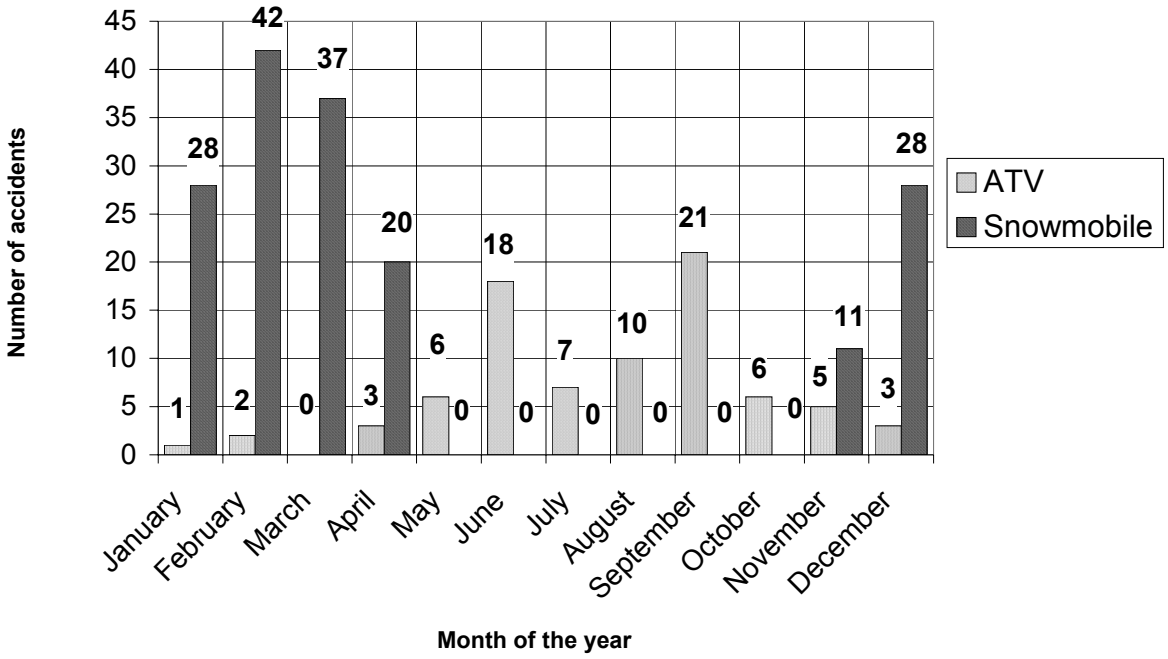


Source: Accident reports involving a snowmobile or an all-terrain vehicle in Nord-du-Québec from January 1, 1995 to December 31,1999.

3.1.14 Month of Accident

Snowmobiles are used chiefly from November to April. ATVs can be used all year long, although they are used more when there is no snow on the ground, from May to October. People who live in Nunavik use ATVs as a means of transportation during a longer period than people in Cree or Jamesian communities. The following figure illustrates the seasonal use of ORVs. The months when most accidents occur are February and March for snowmobiles (79 accidents) and June and September for ATVs (39 accidents). The available information does not explain why there are more ATV accidents in June and September. We could however suspect that this can be linked to the use of ATVs by school children when school starts and finishes.

FIGURE 4
DISTRIBUTION OF SNOWMOBILE AND ATV ACCIDENTS IN NORD-DU-QUÉBEC ACCORDING TO THE MONTH OF THE YEAR, FROM 1995 TO 1999



Source: Accident reports involving a snowmobile or an all-terrain vehicle in Nord-du-Québec from January 1, 1995 to December 31,1999.

3.1.15 Accident Factors

When writing an accident report, the police officer determines what caused the accident (how and why the accident happened), he writes in a supplementary report the apparent main factor, meaning that which caused the accident (prime factor) and if necessary, ads a second factor (secondary factor) that could have contributed to the accident. This information is based on the police officer's judgement.

The police officer is not required to complete this supplementary report and very often, it is not completed. Indeed, more than 35% of the reports have no entry for "Prime Factor" and 49% for "Secondary Factor". This is why the data contained in Table 16 must be interpreted with caution.

Moreover, caution is advisable in the interpretation of accident factors due to the fact that for accidents involving a road vehicle or a pedestrian, the available information does not establish who is responsible for the accident, whether the driver of the road vehicle, the pedestrian or the ORV driver, unless it is clearly indicated in the supplementary report.

Codes are used in accident reports to record accident factors (previously established list of factors). Accident factors most frequently reported are reckless driving and speed, as well as impaired driving (alcohol). It is however probable that numerous cases involving alcohol or drugs are not reported since, to be able to write it in the report, the police officer must confirm it by doing a breathalyser test or by using another method.

There were 26 accidents where impaired driving was identified as the prime accident factor, 23 of which in Inuit territory. Whether this accident factor is more frequent in certain age groups, particularly among the 15-19 years old, was also verified. But it does not seem to be the case with that age group. Instead, Table 17 shows a greater frequency in the 20-29 age group.

According to the accident reports, impaired driving is a problem that especially affects certain northern villages of Nunavik. Only one case was reported in a Cree community. For *fatal accidents*, this factor was present in one third of the cases.

As for other factors that have a certain importance, these are, in order, carelessness or distraction, refusal to yield right of way, obstructed visibility or glare, excessive speed, driving on the wrong side of the road and failure to observe a mandatory stop.

Human factors pertaining to the driver (attitudes, behaviour, compliance with regulations, recklessness or distraction) are involved in a significant number of accidents where prime or secondary factors were identified, that is in 85% of cases (138 on 162).

The most frequent factors that do not pertain to the driver are: obstructed visibility/glare (11), bad road conditions (11), weather conditions (10), and mechanical defect including the brakes or headlights (10).

TABLE 16
PRIME FACTOR AND SECONDARY FACTOR IN SNOWMOBILE AND ATV ACCIDENTS IN NORD-DU-QUÉBEC, FROM 1995 TO 1999

Accident Factors	Prime factor		Secondary factor	
	Number	%	Number	%
Reckless driving/speed	34	13.7	30	12.2
Impaired driving/alcohol	26	10.5	3	1.2
Carelessness or distraction	21	8.5	22	9.0
Refusal to yield right of way	10	4.1	5	2.0
Others	9	3.7	8	3.2
Obstructed visibility, glare	8	3.2	3	1.2
Exceeding speed limit	8	3.2	6	2.4
Driving on the wrong side of the road	8	3.2	4	1.6
Failure to observe a mandatory stop	7	2.8	2	0.8
Following another vehicle too close	5	2.0	2	0.8
Bad road condition	4	1.6	7	2.8
Faulty brakes	3	1.2	2	0.8
Other mechanical defects	3	1.2	1	0.4
Backing-up illegally	2	0.8	1	0.4
Pedestrian negligence	2	0.8	1	0.4
Weather conditions	2	0.8	8	3.2
Temporary obstacles on the road	2	0.8	0	0.0
Improper parking or parking in a dangerous place	1	0.4	2	0.8
Failure to turn lights on or to switch to low light	1	0.4	1	0.4
Dangerous overtaking	1	0.4	2	0.8
Faulty headlights or spotlights	1	0.4	1	0.4
Insufficient lighting	1	0.4	1	0.4
Animals on the road	1	0.4	0	0.0
Nothing to report	0	0.0	8	3.2
Impaired driving/medication, drugs	0	0.0	0	0.0
Fatigue, sleeping or sudden discomfort	0	0.0	1	0.4
Passed on a red light	0	0.0	1	0.4
Non compliant load	0	0.0	1	0.4
Inadequate road alignment	0	0.0	1	0.4
Inadequate signage	0	0.0	2	0.8
No reported factor	88	35.5	122	49.2
Total	**248**	**100.0**	**248**	**100.0**

Source: Accident reports involving a snowmobile or an all-terrain vehicle in Nord-du-Québec from January 1, 1995 to December 31,1999.
Note: This data can correspond to factors either related to ORVs, road vehicles or pedestrians involved in an accident with an ORV.

TABLE 17
LINK WITH PRIME FACTOR: IMPAIRED DRIVING AND AGE, FOR ORV ACCIDENTS IN NORD-DU-QUÉBEC, FROM 1995 TO 1999

Age	Number of accidents	Ratio (%) with impaired driving	Ratio (%) of drivers involved in an accident
14 and less	0	0	5.6
15-19	6	23.1	22.6
20-29	11	42.3	27.0
30-39	6	23.1	19.4
40-49	1	3.9	9.7
50-59	0	0	3.6
60-69	1	3.9	4.4
Not indicated	1	3.9	7.7
TOTAL	**26**	**100.0**	**100.0**

Source: Accident reports involving a snowmobile or an all-terrain vehicle in Nord-du-Québec from January 1, 1995 to December 31,1999.

3.1.16 Correlation between Accident Location and Accident Factor

Inuit Territory

The highest number of accidents, 123 out of 248 over five years (Table 7) occurred among the Inuits. Considering the number of accident reports completed in Nunavik, a table of the main factors involved is presented on the next page.

The order of importance of the causes is essentially the same as for the rest of Nord-du-Québec, although alcohol and impaired driving are the most frequent factors, instead of speed and reckless driving. 23 reported accidents were caused by impaired driving (alcohol, drugs). Of the 23 cases, 12 took place in Kuujjuaq, five in Kuujjuarapik, four in Salluit, one in Kangirsuk and another one in Kangiqsualujjuaq.

The drivers' young age and inexperience could also be a factor.

TABLE 18
PRIME FACTOR AND SECONDARY FACTOR FOR ACCIDENTS IN NUNAVIK, FROM 1995 TO 1999

Factor of accidents	Prime factor		Secondary factor	
	Number	%	Number	%
Impaired driving/alcohol	23	18.7	2	1.6
Reckless driving/speed	15	12.2	20	16.3
Carelessness or distraction	10	8.1	9	7.3
Obstructed visibility, glare	6	4.9	1	0.8
Failure to observe a mandatory stop	5	4.1	1	0.8
Other	4	3.3	3	2.4
Driving on the wrong side of the road	3	2.4	2	1.6
Bad road condition	2	1.6	5	4.1
Exceeding speed limit	2	1.6	5	4.1
Weather conditions	1	0.8	5	4.1
Other mechanical defects	1	0.8	1	0.8
Insufficient lighting	1	0.8	0	0.0
Refusal to yield right of way	1	0.8	1	0.8
Pedestrian negligence	1	0.8	1	0.8
Temporary obstacles on the road	1	0.8	0	0.0
Failure to turn lights on or to switch to low light	1	0.8	1	0.8
Faulty headlights or spotlights	1	0.8	1	0.8
Following another vehicle too close	1	0.8	0	0.0
Backing up illegally	1	0.8	1	0.8
Faulty breaks	0	0.0	2	1.6
Dangerous overtaking	0	0.0	2	1.6
Non compliant load	0	0.0	1	0.8
Improper parking or parking in a dangerous place	0	0.0	1	0.8
Inadequate road alignment	0	0.0	1	0.8
No reported factor	42	34.1	57	46.4
Total	**123**	**100.0**	**123**	**100.0**

Source: Accident reports involving a snowmobile or an all-terrain vehicle in Nord-du-Québec from January 1, 1995 to December 31,1999.

Cree territory

Very few accidents were reported on the Cree Territory (29 of 248) and only seven accident reports indicated an accident factor. For this reason, no specific study was conducted for these communities.

MBJ and Enclaved Towns

From 1995 to 1999 in the James Bay territory, 96 accidents were compiled involving *off-road vehicles* (71 with a snowmobile and 25 with an ATV). We can observe differences in the causes of accidents (prime and secondary factors) between the MBJ and enclaved towns (where snowmobiles and ATVs are mainly used for recreational purposes) and the Cree and Inuit communities (where these vehicles are used for utility purposes). Here are some examples.

- For the MBJ and enclaved towns, the prime factor "impaired driving" is not very frequent with only two cases (2.1% of accident causes, compared to 18.9% for the Inuits), plus one case as secondary factor.

- For Jamesians, reckless driving/speed is the prime factor in importance for accidents, with 19 cases (19.8%) plus 10 cases where it is the secondary factor. Among the Inuits, it is the second most frequent cause with 12.3%.

- Excessive speed is the prime factor in six cases among Jamesians (6.3% of cases) compared to two cases among the Inuits (1.6% of cases).

- Among Jamesians, in eight cases "Refusal to yield right of way" is the prime accident factor (8.3%) compared with only one for the Inuits (0.8%).

3.1.17 Characteristics of Snowmobile and ATV Accidents

The number of all-terrain vehicle accidents is two times less than snowmobile accidents in Nord-du-Québec, which corresponds to the ratio of operating vehicles (see reference Table 2). Of the three Nord-du-Québec groups, the Inuits have a number of ATV accidents that comes closer to the number of snowmobile accidents (53 compared to 68).

In proportion, ATV accidents cause more bodily injuries than snowmobile accidents. It is possible that snow is a favourable factor alleviating the consequences of certain impacts. The following table shows the severity of injuries with ATVs and snowmobiles.

TABLE 19
THE SEVERITY OF SNOWMOBILE AND ATV ACCIDENTS FOR NORD-DU-QUÉBEC, FROM 1995 TO 1999

Severity	Snowmobile	%	ATV	%
Fatal	5	3.0	7	8.5
Severe	33	19.9	21	25.6
Minor	43	25.9	28	34.2
Material damage only	85	51.2	26	31.7
Total	**166**	**100.0**	**82**	**100.0**

Source: Accident reports involving a snowmobile or an all-terrain vehicle in Nord-du-Québec from January 1, 1995 to December 31,1999.

4. POSSIBLE CAUSES OF ACCIDENTS IN RELATION WITH LOCAL CONTEXT

First of all, the following sections state certain assumptions to explain the accidents for the entire region of Nord-du-Québec, irrespective of territory. Afterwards, certain characteristics are identified for each territory: Cree, Inuit, MBJ and enclaved towns.

Further studies should be conducted to better understand the context, using additional data, which could be collected from local authorities, to qualify more precisely the importance of variations in the number of reported accidents according to the three territories under study. To that effect, accident reports should always be completed when accidents occur and, when completed, should be more detailed. First, it should be checked if certain communities have a tendency not to report accidents or, at least *minor accidents*. Incidentally, other factors could explain differences from one local community to another: different ORV utilization ratios, culture in relation with safety, perception of police services by the population, location of a percentage of accidents outside villages, level of police surveillance, police tolerance, light traffic, etc.

4.1 For the Entire Region

Contrary to other Québec regions, *off-road vehicles* are very much used inside the Nord-du-Québec villages. From 1995 to 1999, approximately 54% of reported accidents in this region took place inside villages, on a main street, in an alley or a parking lot (see Table 11). Moreover, a large proportion of accidents inside villages involved a road vehicle, no specific compilation was completed however, to identify the nature of these accidents. We can look for reasons why there are more collisions of snowmobiles with motor vehicles (94 accidents) than ATVs (25 accidents). Driving inside villages can also explain the fact that ORV accidents involving pedestrians are quite frequent (20 reported accidents). There was no compilation however about accidents taking place inside villages, according to territory.

The most plausible hypotheses to explain the accidents inside villages are:

- Driving under the influence of alcohol or drugs (it is a general cause of accidents, but maybe more important inside villages).
- Failure to observe driving regulations, such as mandatory stops and driving on the right side of the road.
- Dangerous use of *off-road vehicles* on *public roads* (speed and carelessness).
- Accumulation of snow obstructing vision.
- Lack of adequate signage for ORVs.
- Significant ORV utilization.

According to the data from accident reports, most accidents are caused by driver-related human factors. They are caused by an unsafe use of *off-road vehicles* (or possibly of a road vehicle when such a vehicle is involved). Several accident factors (prime and secondary factors) identified in Section 3.1.15 indicate unsafe behaviour such as: driving impaired by alcohol or drugs, excessive speed, driving on the wrong side of the road, dangerous manoeuvres, etc.

4.2 For the Inuit Territory

Since there are more reported accidents in Nunavik than in the Cree territory and the MBJ and enclaved towns, this section contains a more extensive study of the causes explaining the accidents in this territory.

4.2.1 ORV Traffic in Nunavik Communities

The presence of ORVs (on roads, on private properties, in parking lots) is more significant in Inuit communities than in the rest of Nord-du-Québec. It appears that numerous Nunavik residents use *off-road vehicles* as a means of transportation, instead of road vehicles. They mostly drive them on municipal streets (or street *right-of-way*).

In Inuit villages, people are less interested in owning a road vehicle since the villages have only a few roads and streets and there are no roads linking the communities. Moreover, *off-road vehicles* are more versatile and much cheaper than road vehicles.

PHOTOGRAPH 1
ORVS IN THE COMMUNITIES, SALLUIT, IN NUNAVIK

Anick Guimond, 2001

In Inuit villages, accidents occur for various reasons. Here are certain hypotheses specific to the Nunavik situation:

- Non-compliance to certain safety rules.
- Absence of clear limits for private driveways (no cart-way) which makes it possible for ORVs to enter or exit a private property in more than one place.
- Significant ORV traffic inside villages increases the risk of accidents involving ORVs and pedestrians (among Inuits there are more ORV accidents involving pedestrians).
- Driving under the influence of alcohol or drugs as well as other assumptions indicated in Section 4.1. In Nunavik, impaired driving is indicated as the prime factor of 17 ATV accidents compared to six snowmobile accidents. It is possible that Inuits mainly drive ATVs inside villages, which would explain the relation between alcohol and the number of ATV accidents.

4.2.2 Unsafe Behaviour

Unfortunately, accidents often occur as a result of unsafe use of the *off-road vehicle* on the driver's part. Thus numerous accidents could be avoidable. In the Inuit territory, children start early to drive *off-road vehicles*. Children are likely to ignore driving-related dangers, and to lack the physical strength and reflexes to react rapidly.

Also, it is not uncommon to see *off-road vehicles* transporting a number of passengers exceeding the number prescribed by the vehicles' manufacturer. Among other things, this can be the cause of passenger falls or vehicle imbalances. Several users do not wear a helmet, which is an accident-aggravating factor.

4.2.3 Off-Trail Traffic

In the absence of federated or official trails in Nunavik, snowmobiles and ATVs run mostly on informal trails.

Numerous factors explain accidents taking place off-trail. Here are a few examples:

- Surface irregularities cause imbalances.
- The absence of appropriate signage is an inconvenience.
- During winter, in the absence of marked trails, users can recklessly ride on thawing waterways or where the ice is too thin.

4.2.4 Physical and Climatic Constraints

Nunavik weather conditions are constraints with regard to the safe use of *off-road vehicles*. In times of severe cold, motor trouble or a major breakdown can be tragic when occurring at a certain distance from dwellings. With strong winds and drifting snow, the snowmobile or ATV driver can get lost or inadvertently tread on dangerous ground.

The fact that health services are so distant can also have an effect on the severity of injuries.

In Nunavik, a locally more rugged terrain, climatic changes causing ever earlier thaw; the decrease of ice thickness and the destabilization of informal trails due to permafrost locally thawing, can result in additional risks of accidents. The study of accident reports however does not give any indications along these lines. It would be interesting to check if physical and climatic constraints can have a significant impact on the safety of users.

In Nunavik, the snowmobile season is characterized by a short daylight period. Thus, it is not surprising to observe in Nunavik, that snowmobile accidents occur more often when it is dark. Indeed, 40 accidents on 68 took place during the night or in semi-darkness, that is 59% of accidents. The information contained in accident reports does not imply however that darkness is a significant factor. Even at night, the main accident factors are still impaired driving, excessive speed or reckless behaviour.

A few possible risks linked to physical and climatic constraints can occur in the presence of:

- Storms, when there is a danger of getting lost or encountering dangerous situations (lake, steep hill, collision with a rock, etc.).
- Extreme cold, which increases risks of frostbite and motor breakdowns.

- Steep drops, which increase the risk of loss of control.

- Few hours of daylight in winter, which could increase the risk of accidents, particularly on trails outside populated areas.

- Crossing watercourses with locally thin ice cover due to global warming.

- Destabilization of certain trails or sections of trails, due to permafrost thawing.

4.3 For the Cree Territory

In Cree villages, ORV traffic is significant but not as much as in Inuit villages. This can be explained by the existence of a road network between the communities and to southern Québec; most households (families) in this territory have a road vehicle for transportation. Because of this, the ORV is not used as much outside villages as a means of transportation, except for trips to hunting, fishing and trapping territories and probably even inside villages.

There seems to be a certain tolerance among local police forces for this illegal traffic on *public roads*.

The absence of marked trails for ORVs on the most part of the Cree territory results in the presence of snowmobiles and ATVs on *public roads*, access roads to resources and informal trails. Consequently, it is not surprising to observe that snowmobile and ATV accidents occur outside federated trails[8].

Several factors explain accidents occurring off-trail. Here are a few examples:

- Meeting road vehicles is more frequent, increasing the risk of collisions.

- Vehicle imbalances due to irregular surfaces.

- Absence of appropriate signage.

- Absence of markers can cause accidents since users can travel and end up bad lands when traveling in bad weather.

In Cree territory, numerous unsafe behaviour have caused or aggravated accidents: excessive speed, driving on the wrong side of the road, dangerous manœuvre, no helmet wearing, number of passengers exceeding the number prescribed by the manufacturer.

8 According to the manual processing of accident reports, approximately 19.4% of accidents would take place on trails (federated or not). We do not have the information for federated trails only.

The physical and climatic conditions in Cree territory can explain part of the reported accidents, though to a lesser extent than in Inuit territory. The terrain is not as rugged in Cree territory, cold weather is generally less severe and daylight periods are longer.

4.4 For the MBJ and Enclaved Towns

The Jamesian residents use snowmobiles and ATVs mostly for recreational purposes. It is less common to see them running in the villages compared with Inuit and Cree ORV users. The accident reports demonstrate however that there is an ORV informal traffic in these communities, and the manual analysis of accident reports, shows that a large number of accidents took place in urban areas.

Even in the presence of a network of federated trails for snowmobiles or ATVs, ORV enthusiasts nevertheless commonly use *public roads* and informal trails, particularly for sport fishing and hunting activities. This creates safety problems, even if this situation is less of a concern than in Cree or Inuit territory.

The reckless behaviour of ORV drivers has caused a great number of accidents. Excessive speed is an accident factor that shows up more frequently in the MBJ territory and enclaved towns than in Cree and Inuit territories. This is not surprising, considering ORVs are chiefly used for recreational purposes on federated or official trails.

In Nord-du-Québec, if a good number of accidents occur on *public roads*, only a few take place on road *right-of-way* under MTQ management (12 in five years or 4.8% of all the accidents). Obviously, most occur on the territory of MBJ and enclaved towns since it's where we find most of the roads. According to the available information, no accident took place at snowmobile *passageways*. These *passageways* are not a significant safety concern for users in this region.

Off-road vehicle drivers generally use roads (*right-of-way*) managed by MTQ to access official trails or areas difficult to access otherwise. It is in these circumstances that 12 accidents occurred, but it is difficult to identify the specific causes because little information is available.

5. COMPARISON BETWEEN NORD-DU-QUÉBEC, ABITIBI-TÉMISCAMINGUE AND THE WHOLE OF QUÉBEC

Here are some particularities noted during the study of accident reports involving ORVs in Nord-du-Québec, that differ from the situation in overall Québec and in Abitibi-Témiscamingue.

- According to the study of accident reports, the number of accidents in Nord-du-Québec is much more significant (ratio to population) than in Abitibi-Témiscamingue. From 1995 to 1997[9], 147 snowmobile and ATV accidents were reported in Nord-du-Québec compared to 246 for Abitibi-Témiscamingue, with a population four times larger (156,653 inhabitants versus 39,467 in 1997). This no doubt reflects the much greater importance of *off-road vehicles* as a means of transportation in Nord-du-Québec.

- There are much fewer reported snowmobile and ATV accidents (as a ratio) in urban areas of Québec and in Abitibi-Témiscamingue (for example in A.-T.: 45 over 246: 18.3%[10]) than in Nord-du-Québec communities (134 over 248 : 54%). This situation illustrates the widespread use of *off-road vehicles* as a means of transportation inside villages.

- According to the *Étude québécoise sur les blessures attribuables à la motoneige* (Québec study of injuries related to snowmobiles) for 1993-1994, 16% of these accidents in Québec took place on a *public road*. From 1995 to 1999, 64.5% of accidents in Nord-du-Québec occurred on a *public road*.

- The main accident factors (prime and secondary) are similar in Nord-du-Québec and Abitibi-Témiscamingue, with very different ratios however. Reckless driving/speed is the prime factor for both regions, but accounts for 26% of accidents in Abitibi-Témiscamingue compared to 14% in Nord-du-Québec. The "impaired driving - alcohol/drugs" factor makes up 10.5% of accidents in Nord-du-Québec compared to 5.3% in Abitibi-Témiscamingue. As for all of Québec, without knowing the exact ratio of accidents involving impaired driving, it seems that the alcohol factor was frequently present in the *fatal snowmobile accidents* that happened in Québec from 1986-1987 to 1997-1998. Indeed, alcohol level tests were done on some of the victims and 35% had a blood alcohol concentration higher than the legal norm.

- Drivers who had an accident with an *off-road vehicle* in Nord-du-Québec are somewhat younger than those of Abitibi-Témiscamingue (55.2% in Nord-du-Québec are less than 29 years old, against 47.2% in Abitibi-Témiscamingue).

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9 The *Portrait de la sécurité liée à l'utilisation de la motoneige et des véhicules tout-terrain en Abitibi-Témiscamingue*, did not include the accident reports from 1998 and 1999.

10 Ministère des Transports du Québec, Direction de l'Abitibi-Témiscamingue–Nord-du-Québec, *Portrait de la sécurité liée à l'utilisation de la motoneige et des véhicules tout-terrain en Abitibi-Témiscamingue*, December 2000, p. 45.

- Drowning caused no *fatal accidents* in Nord-du-Québec. Every year in Abitibi-Témiscamingue, a certain number of snowmobilers drown after recklessly venturing on watercourses or lakes covered with thin ice[11]. In all of Québec, among fatalities related to snowmobile accidents from 1986-1987 to 1997-1998, 16% were by drowning[12].

- According to the study completed for the 1993-1994 season[13], the injuries caused by snowmobile accidents were to the head, neck or face in a ratio of 7%. It is highly probable that there are more injuries to the head in Nord-du-Québec due to the absence of helmet and shield wearing in a large number of cases. There is no study to verify that however.

- In Nord-du-Québec, very few ORV accidents happened on a road under MTQ management (12 reported accidents from 1995 to 1999) and none occurred at an authorized *passageway*. The low volume of traffic probably explains this. For Abitibi-Témiscamingue, from 1995 to 1997 (1998 and 1999 data was not reviewed), there were 26 ORV accidents, three of which occurred at authorized *passageways*.

- There was a greater number of *fatal accidents* in Nord-du-Québec from 1995 to 1997 than in Abitibi-Témiscamingue (6.1% of *fatal accidents* compared to 3.3% for A.-T.). On the other hand, there was proportionally less *severe accidents* (18.4% in Nord-du-Québec compared to 20.3% in A.-T.) and *minor* accidents (29.9% in Nord-du-Québec, 34.6% in A.-T.).

11 Ministère des Transports du Québec, Direction de l'Abitibi-Témiscamingue–Nord-du-Québec, *Portrait de la sécurité liée à l'utilisation de la motoneige et des véhicules tout-terrain en Abitibi-Témiscamingue*, December 2000, p. 22.

12 Gouvernement du Québec, Bureau du coroner (January 1999), *Analyse descriptive des accidents de motoneige, saisons 1986-1987 à 1997-1998*, p. 8.

13 Comité de prévention des traumatismes du réseau de la santé publique du Québec (March 1996), *Étude québécoise sur les blessures attribuables à la motoneige*, Research report p. 29.

6. STRENGTHS AND WEAKNESSES IN THE USE AND SAFETY OF SNOWMOBILES AND ATVS

The following table shows the main strengths and weaknesses in the safety of snowmobile and ATV users in Nord-du-Québec.

TABLE 20
STRENGTHS AND WEAKNESSES RELATED TO THE SAFETY OF SNOWMOBILE AND ATV USERS IN NORD-DU-QUÉBEC

STRENGTHS	WEAKNESSES
• In Inuit territory, due to the absence of a road network (to link the villages), ORVs constitute useful means of transportation since they significantly facilitate access to the territory. • ORVs are much less costly than road vehicles, and this is beneficial to low-income families. • ORVs facilitate access to hunting, fishing and trapping territories. • In the MBJ territory and enclaved towns as well as in the Cree territory, the presence of old roads or forestry roads facilitates safe off-trail traffic. • There are snowmobiles and ATV clubs in the MBJ territory and enclaved towns. • Snowmobiles and ATVs are adapted to northern weather conditions. • In Cree communities, the low number of reported accidents can demonstrate the existence of favourable behaviour with regard to safety.	• The development of official trails is complex in Nunavik territory because it is so vast. • In Nunavik, long distances between villages and the absence of services between them are an additional risk with regard to safe ORV traffic and the severity of injuries when an accident happens. • Attendance time can be long when accidents take place far away from villages or towns and health services. • The use of informal trails increases the risk of accidents, particularly due to surface conditions, locally rugged terrain and watercourse crossing. • On federated trails, there are conflicts between members and non-members. • Nunavik streets were not planned for ORV traffic. • Signage is sometimes inadequate. • Weather conditions in Nord-du-Québec can hinder ORV safety: frequent storms, extreme cold, strong winds, glare, etc. • Human factors are the cause of numerous accidents: impaired driving, reckless driving excessive speed, failure to observe regulations, etc. • Certain legal provisions applying to *off-road vehicles* are ill adapted to the context of Nord-du-Québec and many are not enforced.

7. POSSIBLE COURSES OF ACTION TO REINFORCE SAFETY

In the past, the Gouvernement du Québec have completed several studies and consultations to get a better knowledge and understanding of the safety issues on the use of snowmobiles and all-terrain vehicles. Among other things, this resulted in developing specific regulations, particularly with the *Off-Road Vehicles Act*[14]. However, certain existing legal provisions are not adapted to the nordic context. A draft regulation is being prepared in order to adapt the regulations concerning the use of ORVs in northern environments.

The following section introduces possible courses of action for safety improvement in the use of snowmobiles and ATVs in Nord-du-Québec.

As a whole and as suggested in the *Pre-Analysis*, "… It is essential that the population be included in the planning process and implementation of the various projects, especially those related to transports. The development of local expertise in transport and its logistics are also the highest importance."[15]

7.1 Education and Public Awareness

The top priority should be the users' awareness of various risks involved with the use of *off-road vehicles*. Indeed, mostly driver-related human factors are involved in a large majority of accidents. The following topics could be discussed:

- Driving impaired by alcohol or drugs
- Excessive speed and reckless driving
- Helmet wearing
- Risks related to carelessness and distraction
- Young drivers, possibility of underestimating dangers and risks related to inexperience
- Dangers specific to informal trails
- Dangers related to driving ORVs on *public roads*.

When the draft regulation will be adopted, a snowmobile and ATV safety campaign better adapted to the cultures of each territory will be launched, with leaflets in Inuktitut and Cree in order to effectively reach the drivers and general population. It would be important that the safety campaing be done in the languages spoken in each community. The implementation of this project could require the involvement of police forces, social services, schools and community leadership. It is important that the actions be under the direction of local stakeholders or with their involvement.

14 *Off-Road Vehicles Act*, R.S.Q., c. V-1.2.

15 Ministère des Transports du Québec, Direction de l'Abitibi-Témiscamingue–Nord-du-Québec, *Pre-Analysis*, *Transportation Plan of Nord-du-Québec*, April 2002, p. 21.

Messages on snowmobile and ATV safety could be publicized in local media, posted in local businesses or on restaurant place mats, presented during meetings or disseminated by any other appropriate means.

7.2 Marked Trails and Informal Trails

Free *off-road vehicle* traffic on informal trails cannot be ignored and involves specific risks. However, the information available from accident reports does not make it possible to clearly ascertain if some accident factors are specific to these paths. There is thus a need to collect additional information on accidents occurring on these paths before introducing particular measures for improvement or adaptation.

During the consultations done by MTQ in Nord-du-Québec in the framework of the transportation plan, several requests were made for new trails particularly, certain Nunavik communities want marked trails for snowmobiles and ATVs built between them and from their village to hunting and fishing territories in order to improve the safety of users[16].

Here are some questions that would help select the trails that could be developed and marked, particularly for the Cree and Inuit communities. How many hunters and fishermen would take advantage of the new trails? Would it be advisable to develop combined marked trails for snowmobiles and ATVs? What are the specific needs for safety and convenience in the nordic context? On a tentative basis, we can think of the following needs: installation of signage and marker posts; building rest stops (gas depot, solar satellite telephones, shelters and emergency food).

Maybe the communities could, with the collaboration of government authorities, propose paths or trails to be marked for *off-road vehicles* in order to improve land connections between the communities and link villages with hunting and fishing territories in a safer way. This proposal should include a study that particularly takes into account climate change, availability of resources and impact on user safety.

Local and regional entities can play an important role in raising the population's awareness concerning the safety of users, by indicating measures to reduce the number of accidents and by implementing these measures using various means of communication.

16 Ministère des Transports du Québec, Direction de l'Abitibi-Témiscamingue–Nord-du-Québec, *Pre-Analysis*, *Transportation Plan of Nord-du-Québec*, April 2002, p. 25.

7.3 Facilities in the Communities

Off-road vehicles are generally driven on the streets of the communities, more particularly in Inuit territory. These streets were designed for road vehicles however. With this in mind, it seems clearly preferable to adapt existing facilities to actual practices and adapt the regulations concerning *off-road vehicles* to this nordic reality. For this purpose, it would be interesting to review the communities' street and signage layout and see if changes could be implemented to improve the safety of the population.

7.4 Role of Municipalities and Regional Authorities

Among the regional entities liable to be interested by the use of ORVs in Nord-du-Québec, there would be the Cree Regional Authority, the Kativik Regional Government and the Cree and Kativik regional authorities have the mandate and power to act on issues involving snowmobiles and ATVs. For its part, the municipal council for MBJ and enclaved towns has the power to obtain, for this territory, the jurisdiction of a regional county municipality, particularly with regard to territory development.

Apart from those authorities, other organizations would probably like to be involved in an integrated approach on snowmobiles and ATVs, including the CRDs.

By the way, municipal administrations must be involved and informed of the significant number of accidents occurring each year on their road network and of what they can do to improve safety. This is motivated by the fact that more than half of the accidents take place in the communities and numerous accidents occur on the villages' access roads. In order to raise the population's awareness, a partnership with local police forces is also critical to the success of this campaign.

7.5 Measures under the Control of Provincial Authorities

7.5.1 Legislation and Regulation Enforcement

At the *Pre-Analysis* stage, it was suggested to adapt regulations to the specific context of Nord-du-Québec and its inhabitants[17]. A significant characteristic of the use of snowmobiles and ATVs in Nord-du-Québec is that they are by all means utility vehicles (more specifically for Aboriginals). They have become essential in the practice of subsistence activities and for transport in the communities.

Driving an ORV on *public roads* is only allowed in particular circumstances under certain specific conditions by the *Off-Road Vehicles Act*. Municipalities have the power to authorize ORV traffic on municipal roads by prescribing the specific conditions, the time periods and the types of vehicles (Section 11-6). The municipal by-laws written to this effect however, must be approved by MTQ in compliance with the Highway Safety Code.

17 Ministère des Transports du Québec, Direction de l'Abitibi-Témiscamingue–Nord-du-Québec, *Pre-Analysisc*, *Transportation Plan of Nord-du-Québec*, April 2002, p. 18.

Any ORV traffic on *public roads* must be authorized and indicated by appropriate signage.

Some changes in the regulations are obviously desirable on the basis of conditions specific to the Nord-du-Québec context. However, the lack of safety in the use of vehicles still is the main cause of accidents. Certain rules cannot be adapted, such as those pertaining to the driver's minimum age or to impaired driving.

7.5.2 Monitoring of Federated Trails

Du to the significant distances covered by federated trails, very little monitoring is actually done on the trails. Only the areas of Chibougamau–Chapais and Radisson have patrols; the areas of Matagami and Lebel-sur-Quévillon have no patrols (except for two days every year when SQ patrolmen from Rouyn-Noranda travel on the trails). The situation has improved, since January 2003, because police officers have snowmobiles in each police station of the MBJ territory[18].

7.6 Organizing Clubs in Aboriginal Communities

Organizing clubs in Cree and Inuit communities could be a positive course of action. This would help in defining the needs related to building marked trails. The club would also see to the maintenance of these trails. It would be necessary however to check with the leaders of these communities if they agree with the club formula.

For the territories where clubs already exist, there is an interest in increasing their number of membership. "Indeed, it has been proven that the level of delinquency with snowmobiles and ATVs is less among affiliated members."[19].

7.7 Insurability and Registration

The *Off-Road Vehicles Act,* (Section 19) requires that ORV owners hold a civil liability insurance policy for at least $500,000. In fact, it is quite complicated for Nunavik residents to get their vehicle insured, since insurers usually do not accept to cover them. The draft regulation on *off-road vehicles* sets out to exempt them from the obligation of holding such an insurance.

Incidentally, most owners of *off-road vehicles* in Nunavik do not register their vehicles. They thus contravene Section 20 of the *Off-Road Vehicles Act*, which requires them to carry proof of registration for their vehicle. This issue should also be the subject of discussions between government and regional authorities.

On another topic, Cree non-members occasionally use trails appertaining to the clubs affiliated to the Fédération des clubs de motoneigistes du Québec to access their

18 Sûreté du Québec in Matagami (2003), Personal communication
19 Ibid.

hunting, fishing and trapping territories. This is particularly the case for the inland Cree communities. There is tolerance presently. The *Draft Regulation on Off-Road Vehicles* has taken this situation into consideration.

CONCLUSION

The use of snowmobiles and ATVs is an important part of the way of life in Nord-du-Québec, particularly among the Crees and the Inuits who use them for transport purposes, including for subsistence activities. In Inuit territory, there would be more ORVs than automobile vehicles because of the absence of a road network linking the villages between them and to the south of Québec. As for Jamesians, the use of ORVs is rather recreational, related to the practice of sports hunting and fishing activities or for outings.

The use of ORVs however is not always safe. From January 1, 1995 to December 31,1999, there was a high number of snowmobile and ATV accidents compared to the population, and this more so in Nunavik with one ORV accident per 75 residents.

For the most part (65%), the accidents occurred on a *public road* and inside villages, 54% of reported accidents took place in populated areas.

In the majority of cases, the cause of the accident must be assigned to the driver's careless behaviour: impaired driving, excessive speed, reckless driving. Consequently, to improve the safety of snowmobile and ATV use, the main task remaining is the education and awareness of users.

Other measures should be contemplated, under the management of local and regional organizations. For example, the determination of the needs in Cree and Inuit territories or the possibility of building marked trails and regulating ORV traffic in the villages.

Moreover, it appears that several existing regulations for ORVs are not enforced and that some of them are not adapted to the Nord-du-Québec context. A draft regulation is being prepared in order to ease several aspects of the regulations.

GLOSSARY

Severe Accident
An accident where at least one victim was hospitalized.

Minor Accident
An accident where no victim was hospitalized, even if the injuries sustained could have required treatment from a doctor or in an hospital.

Fatal Accident
An accident where at least one victim died in the eight days following accident notification.

Public Road
A ground area or civil engineering structure maintained by a municipality, a government or one of its organizations, and on part of which are built one or several roadways open to the public traffic of road vehicles and, if applicable, one or several bicycle lanes, allowing for exceptions (*Highway Safety Code*, Section 4, Paragraph 3).

Right-of-way
A strip of land acquired or expropriated in the public interest. Of varying width, the right-of-way is a surface of land comprised between the property of abutting owners and assigned to the road and its appurtenances; particularly the ditches and energy distribution networks (electricity, gas, etc.).

Passageway
Marked place allowing the crossing of a traffic lane by *off-road vehicles*.

Off-Road Vehicles
According to the *Off-Road Vehicles Act*, off-road vehicles include: "1˚ Snowmobiles with a design mass not exceeding 450 kilograms and a width not exceeding 1.28 metres including equipment; 2° motorized all-terrain vehicles, equipped with handlebars and at least two wheels, that can be mounted and have a design mass not exceeding 600 kilograms; 3° other motorized vehicles designed to be operated outside *public roads* and prescribed by regulation." (Section 1).

BIBLIOGRAPHY

Nunavik Tourism Association (unknown date) *Nunavik, Friendly, Beautiful and Wild*, map.

Comité de prévention des traumatismes du réseau de la santé publique du Québec (March 1996) *Étude québécoise sur les blessures attribuables à la motoneige, Research Report*, 61 pages.

Groupe d'études inuit et circumpolaires (GÉTIC), Université Laval (May 2002), *Véhicules hors route : les responsabilités des intervenants, les réseaux et l'utilisation,* Draft, 31 pages.

Ministère des Transports (December 2000), Portrait de la sécurité liée à l'utilisation de la motoneige et des véhicules tout-terrain en Abitibi-Témiscamingue, Direction de l'Abitibi-Témiscamingue–Nord-du-Québec, 58 pages.

Ministère des Transports du Québec, Direction de l'Abitibi-Témiscamingue–Nord-du-Québec, *Pre-Analysis*, *Transportation Plan of Nord-du-Québec*, April 2002, 31 pages.

Ministère des Transports du Québec (July 9, 2002), *Environnement socioéconomique*, Internet address: http://www.mtq.gouv.qc.ca/securite/actions/environnement.htm#concertation

Municipalité de la Baie James (July 11, 2002), *Un territoire, deux cultures*, Internet address: http://www.municipalite.baie-james.qc.ca/francais/historique/cultures/

Gouvernement du Québec, Bureau du coroner (January 1999), Analyse descriptive des accidents de motoneige, saisons 1986-1987 à 1997-1998, 26 pages.

Société de l'assurance automobile du Québec (June 2000), Dossier statistique, bilan 1999, Accidents, parc automobile, permis de conduire, 213 pages.

Société de l'assurance automobile du Québec (May 1998), Dossier statistique, bilan 1997, Accidents, parc automobile, permis de conduire, 207 pages.

Sûreté du Québec in Matagami (2003), Personal Communication.

Tourisme Baie-James and Tourisme Québec (2000), *Carte des sentiers de motoneige 2000-2001*, map.

Zins Beauchesne et Associés (1997), Évaluation des impacts économiques directs de la pratique touristique de la motoneige au Québec, 55 pages.