



**Environmental and Social Impact
Assessment for the Troilus Mine Project**

INFRASTRUCTURE AND SERVICES

Environmental and Social Impact Assessment for the Troilus Mine Project

INFRASTRUCTURES AND SERVICES

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Acronyms and abbreviations

2SLGBTQI+	Two-spirited, lesbian, gay, bisexual, transgender, queer and intersex people as well as people in sexual and gender diversity communities who use other terminology	CHSLD	Long-Term Care Centre (Centre d'hébergement et de soins de longue durée)
AADT	Average annual daily traffic	CISSS	Center intégré de santé et services sociaux
ACI	Canadian Real Estate Association	CLIC	Chibougamau Intermodal Logistics Center
ACL	AccèsLogis	CLSC	Local community services center (Centre local de services communautaires)
Afeas	Association féminine d'éducation et d'action sociale	CMC	Community Miyupimaatisiun Center
AHSUNC	Aboriginal Head Start in Urban and Northern Communities	CMHC	Canada Mortgage and Housing Corporation
APCHQ	Association des professionnels de la construction et de l'habitation du Québec	CN	Canadian National
ARBJ	Administration régionale Baie-James (James Bay Regional Government)	CNG	Cree Nation Government
ASD	Apatisiwin skills development	CPE	Centre de la petite enfance
ASDT	Average summer daily traffic	CRSSS	Centre régional de santé et de services sociaux (James Bay Regional Health and Social Services Centre)
AWDT	Average winter daily traffic	CS	Centre de santé (Health Center)
BAPE	Bureau d'audiences publiques sur l'environnement	CSC	Cree School Board
CAVAC	Center d'aide aux victimes d'actes criminels	CSI	Crime Severity Index
CBHSSJB	Cree Board of Health and Social Services of James Bay	CSSBJ	Centre de services scolaires de la Baie-James
CDC	Cree development corporation	DVS	Diploma of Vocational Studies
CEC	Centre d'étude collégiale	EIJBRG	Eeyou Istchee James Bay Regional Government
CFIL	Chemin de fer d'intérêt local	ELCC	Early Learning and Child Care
CFPBJ	Centre de formation professionnelle de la Baie-James	ESDC	Employment and Social Development Canada
		ESIA	Environmental and Social Impact Assessment
		FA	Fisheries Act
		GBA+	Gender-based analysis plus
		GRTATU	Abitibi-Témiscamingue-Ungava Technical Resource Group
		HLM	Low-Rental Housing (Habitation à loyer modique)

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IAA	Impact Assessment Act
IBA	Impact and Benefits Agreement
IRIS	Institut de recherche et d'informations socioéconomiques (Institute for Research and Socioeconomic Information)
ISC	Indigenous Services Canada
ISQ	Institut de la statistique du Québec
JBNQ	James Bay and Northern Quebec Agreement
KP	Kilometre point
LAQ	Affordable Housing Quebec (Logement abordable Québec)
LET	Engineered Landfill (Lieu d'enfouissement technique)
LEET	Trench Landfill (Lieu d'enfouissement en tranchée)
LGA	La Grande Alliance
LSA	Local Study Area
LQE	Loi sur la qualité de l'environnement (Environment Quality Act)
MAMH	Ministère des Affaires municipales et de l'Habitation (Ministry of Municipal Affairs and Housing)
MBCA	Migratory Birds Convention Act
MELCCFP	Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs (Ministry of Environment, the Fight Against Climate Change, Wildlife and Parks)
MSSS	Ministère de la Santé et des Services sociaux (Ministry of Health and Social Services)
MTMD	Ministère des Transports et de la Mobilité durable (Ministry of Transport and Sustainable Mobility)

PDA	Project Development Area
PSL	Shelter Allowance Program (Programme supplément au loyer)
RADF	Règlement sur l'aménagement durable des forêts du domaine de l'État (Regulation respecting the sustainable development of forests in the domain of the State)
RSA	Regional Study Area
RUISS	Réseau universitaire intégré de santé et services sociaux
SHQ	Société d'habitation du Québec
SOPFEU	Société de protection des forêts contre le feu
VC	Valued Component

20. Infrastructure and services

Infrastructure and services have been established as a Valued component (VC), as construction, operation and reclamation activities, as well as mine closure, are likely to result in increased demand for these services and infrastructure, which is likely to affect the capacity and quality of services offered. In addition, federal and provincial directives specific to impact studies require consideration of the project's potential positive and adverse impacts on the region's services and infrastructure.

The assessment of the environmental impacts of the Infrastructure and Services VC is linked to several other components, including:

- Economic Conditions (Chapter 21), since information on the available workforce and labor supply, as well as measures to mitigate and manage economic conditions, is essential for assessing impacts on infrastructure and services.
- Health (Chapter 22), insofar as changes in infrastructure and services may have an impact on the social determinants of health, including the health of indigenous populations.
- The Rights and Interests of the Cree (Chapter 24), since changes in infrastructure and services may have an impact on the quality of life of indigenous populations.

20.1 Scope of assessment

20.1.1 Regulatory and Policy Setting

The analysis of environmental impacts on the VC, infrastructure and services has been prepared in compliance with the federal environmental assessment procedure and, at the provincial level, with the specific environmental assessment provisions applicable to James Bay and Northern Quebec (chapter Q-2, r. 25) under the James Bay and Northern Quebec Agreement (JBNQA). This assessment is therefore based on the Ministry of Environment, the Fight Against Climate Change, Wildlife and Parks (MELCCFP) Directive (Appendix A.1) and the federal government's Tailored Impact Assessment Guidelines for the Troilus mining project (Appendix A.2).

Section 22 (1) of the Federal Impact Assessment Act (2019) (IAA) stipulates the elements that must be addressed in the impact assessment. Among these elements, this section must consider changes to the environment, health, social or economic conditions, the interaction of sex and gender with other identity factors (GBA+), and Indigenous populations. Other federal laws also provide a framework for the assessment of this VC, notably the Fisheries Act (FA) and the Migratory Birds Convention Act (MBCA), regarding the permits and authorizations required to carry out project activities. The same applies to the provincial regulatory framework, with the Mining Act, the Environment Quality Act (LQE.), Directive 019 on the mining industry and the Regulation respecting the sustainable development of forests in the domain of the State (RADF).

At the level of the government of Eeyou-Istchee James Bay, "Zoning By-law No. 213.1" is applicable on government territory, excluding Category I and II lands and former municipalities constituted prior to the coming into force of the James Bay Region Development Act (R.S.Q., c. D-8). As the project is located on

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this territory, it must comply with the regulations in force, and applications for permits and authorizations for the construction and operation of the project will also be required under this Act. Finally, the Cree Nation Mining Policy established by the Cree Nation Government must be considered in the project and impact assessment.

20.1.2 Influence of Consultation and Engagement

From the outset of the project, Troilus Gold Corp (Troilus) engaged in an extensive consultation and communication process with various project stakeholders, as presented in Chapter 4 of the Environmental and Social Impact Assessment (ESIA) report.

Table 20.1 below presents the main themes and key information, traditional knowledge and concerns raised by parties in relation to infrastructure and services. The table also shows how this information has been addressed in this section, and how these commitments influence the assessment of the project's impacts and are considered in Troilus' commitments.

The main concerns raised by Indigenous communities related to the importance of Cree workforce training and road infrastructure in the study area.

Concerns expressed by Jamesian communities focused on the housing shortage, housing support opportunities, workforce retention, training needs, the lack of education and childcare infrastructure, and prospects for the development of services in the region. Project-induced traffic and road safety issues are also concerns raised by the various stakeholders. Concerns raised by land users and representatives of Indigenous communities were also incorporated into the assessment of the project on infrastructure services project.

Table 20.1 Summary of key Information, Indigenous knowledge and Concerns for the Project related to Infrastructure and services

Topic	Key Information, Indigenous Knowledge and Concerns	Influence on the Assessment	Where Information is Addressed in the ESIA
Training	Both the Town of Chapais and the Gender-based analysis plus (GBA+) interview participants emphasized the need to train employees according to the mine's workforce requirements, and to support the various educational institutions in the region in doing so.	Troilus will communicate information on local manpower needs to the region's educational institutions and collaborate with them on mining-related teaching programs.	Section 20.4.1.3
Training	The GBA+ workshops raised the need to support educational institutions in their promotional activities, both in the region and elsewhere in Quebec.	Troilus is already active with educational institutions and will continue to be so throughout the project.	Section 20.4.1.3
Complaints management	The need to set up a system for receiving and handling complaints was raised by GBA+ participants.	Troilus is committed to providing a mechanism for managing concerns.	Section 20.4.1.2
Housing	The issue of the shortage of existing housing, including affordable housing, and the means planned to	Troilus has already taken the housing shortage context into account in its project design (7/7	Section 20.4.1.

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Topic	Key Information, Indigenous Knowledge and Concerns	Influence on the Assessment	Where Information is Addressed in the ESIA
Housing	house new arrivals was raised by GBA+ participants.	shift, objective to recruit locally, etc.). Mitigation measures are proposed in relation to the housing issue	Section 20.4.1.
	Concerns about falling housing prices following the exodus of workers after the mine closure.		
Infrastructure capacity	Concerns have been raised about the lack of spaces for certain services and infrastructure, such as daycare services and shelters for abused women, as well as the increase in demand for these services and infrastructure related to the project.	Mitigation measures are proposed as possible solutions, and social service incentives may be developed in collaboration with communities.	Sections 20.4.1.2 and 20.4.2.3
Infrastructure availability	According to the towns of Chapais and Chibougamau, developing infrastructure (arena, pool, auditorium) is a way of attracting people to the region.	Troilus will develop a sponsorship/partnership plan with local communities in which these issues can be addressed.	Section 20.4.2.3
Support for community organizations	Community organizations need donations and sponsorships	Troilus already contributes and will continue its commitment to supporting local community organizations	Section 20.4.2.3
Transportation	Concerns have been raised by the towns of Chapais and Chibougamau as well as MTMD ¹ about the number of trips, routes and maintenance of the roads used by the trucks.	Troilus is studying optimal route variants with the various stakeholders and has implemented mitigation measures to reduce transportation impacts.	Section 20.4.3.3
Transportation	The Regional Government of Eeyou Istchee Baie-James and land users have raised concerns about the impact of transportation on the Route du Nord and Troilus Road and the maintenance of these roads.	Mitigation measures proposed to reduce transportation impacts	Sections 20.4.3.2 and 20.4.3.3

20.1.3 Potential Impacts, Pathway and Measurable Parameters

Drawing on the expertise of provincial and federal environmental assessment specialists, including some in the mining field, a list of the project's potential environmental impacts on infrastructure and services has been drawn up. This list also reflects the concerns and comments received during the consultation and engagement process involving the various project stakeholders, including the Cree and Jamesian communities. Table 20.2 presents the project's potential environmental impacts, their measurable parameters and the reasons for their selection.

These potential impacts are selected because the project will potentially lead to an increase in population, which could increase demand for public services and infrastructure during the construction, operation and closure phases of the project. These indicators also reflect the impact of increased traffic to and from the project site.

¹ Ministère des Transports et de la Mobilité durable (MTMD)

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Table 20.2 Potential Impacts, Impact Pathway and Measurable Parameters for Infrastructure and Services

Potential impact	Impact Pathway	Measurable Parameter and Unit of Measurement
Change in availability of temporary accommodation and housing	Demand for housing and temporary accommodation could increase as a result of: <ul style="list-style-type: none"> • Permanent settlement of mine employees and their families. • Commuting of mine employees between their place of residence and place of work (Troilus mine) could have an impact on rental residences or temporary residences (hotels, motels, etc.). 	Project workforce: <ul style="list-style-type: none"> • Expected average and maximum number of employees • Number of people in the resident population and number of non-resident employees in the population commuting from outside the LSA/RSA • Availability of permanent and temporary housing (vacancy rates, inventory levels, etc.) • Price of temporary accommodation (\$)
Changes in demand for services and infrastructure	Demand for services and infrastructure could be higher during construction and operation due to: <ul style="list-style-type: none"> • Needs arising from project activities • Population growth, including the presence of a commuting workforce 	<ul style="list-style-type: none"> • Number of people in resident and commuting population • Projected workforce: average and maximum number of expected employees • Parameters indicating changes in service capacity (e.g. wastewater treatment capacity, workload/agent, emergency services call volumes, student/teacher ratio)
Changes in transportation infrastructure demand	Transporting the equipment and employees could increase pressure on transportation infrastructure.	Road traffic volumes (vehicles/day) Air and rail traffic

20.1.4 Boundaries

20.1.4.1 Spatial Boundaries

The boundaries of the study area have been established based on the territory where project activities are likely to produce impacts on services and infrastructure. Spatial boundaries specific to infrastructure and services are shown on Map 20.1.

Project Development Area

The Project Development Area (PDA) encompasses the project footprint and is the anticipated area of physical disturbance associated with mine construction, operation and closure. It corresponds to the pits, stockpiles, tailings facility, industrial complex and other mining infrastructure, as well as the relocation of the access road and power line.

Local Study Area

The Local Study Area (LSA) is the area within which project-related impacts (direct or indirect) can be predicted or measured with a reasonable level of accuracy and confidence. For services and

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infrastructure, the LSA corresponds to the boundaries of the communities most likely to experience positive or adverse impacts in terms of direct access to the project's services and infrastructure. The LSA thus includes the PDA, the Indigenous communities of Mistissini and Oujé-Bougoumou, and the towns of Chibougamau and Chapais. To illustrate the profile of these communities, Statistics Canada data for census subdivisions representing the two Cree reserve lands of Mistissini and Oujé-Bougoumou and the two municipalities of Chibougamau and Chapais were used.

Regional Study Area

The Regional Study Area (RSA) establishes the context for determining the significance of project-specific impacts and also corresponds to the territory where potential cumulative impacts may occur. In the specific case of VC, services and infrastructure, the RSA corresponds to the LSA, since the latter encompasses a sufficiently large area to assess cumulative impacts. The LSA/RSA is shown on Map 20.1.

20.1.4.2 Temporal Boundaries

The temporal boundary of the assessment includes all phases of the project, from the start of construction to the end of closure. According to the current project schedule, project phases include:

- Construction (Year -3 to Year -1).
- Operations
 - Operations phase 1 (Year 1 to Year 21): milling with ore extraction
 - Operations phase 2 (Year 22): milling with no ore extraction.
- Decommissioning and closure
 - Active closure (Year 22 to Year 24)
 - Passive closure (Year 24+).

Refer to Chapter 3 of the ESIA (Project Description) for a detailed description of activities planned during each phase.

20.1.5 Residual Impacts Characterization

Table 20.3 presents measures for characterizing residual impacts.

Table 20.3 Characterization of Residual Impacts on Infrastructure and Services

Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
Direction	The long-term trend of the residual impact	Positive - a residual impact that moves measurable parameters in a direction beneficial to infrastructure and services relative to baseline.

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Characterization	Description	Quantitative Measure or Definition of Qualitative Categories
		<p>Adverse - a residual impact that moves measurable parameters in a direction detrimental to infrastructure and services relative to baseline.</p> <p>Neutral - no net change in measurable parameters for infrastructure and services relative to baseline</p>
Magnitude	The amount of change in measurable parameters or the VC relative to existing conditions	<p>No measurable change - no measurable change in the impact can be noted.</p> <p>Low - infrastructure and service capacity approaches or is at the same level as capacity under existing conditions</p> <p>Moderate - demand for infrastructure and services approaches current capacity and thresholds, but will not lead to a reduction in service standards</p> <p>High - demand for infrastructure and services exceeds current capacity and thresholds, leading to a reduction in service standards.</p>
Geographic scope	The geographical area in which a residual impact occurs	<p>PDA - residual impacts are restricted to the PDA</p> <p>LSA - residual impacts extend to the LSA</p> <p>RSA - residual impacts extend to the RSA</p>
Timing	Not applicable.	Not applicable (N/A) - seasonal aspects are not likely to affect the capacity of community services and infrastructure.
Duration	The time required until the measurable parameter or the VC returns to its existing condition, or the residual impact can no longer be measured or otherwise perceived.	<p>Short-term - the residual effect is restricted to construction (<3 years).</p> <p>Medium-term - the residual effect extends through the operations phase (3 to 24 years).</p> <p>Long-term - the residual effect extends beyond the life of the Project (>25 years).</p>
Frequency	Identifies how often the residual impact occurs and how often during the project or in a specific phase.	<p>Single event - the residual environmental impact occurs once during the project.</p> <p>Multiple irregular event – occurs at no set schedule</p> <p>Multiple regular event – occurs at regular intervals</p> <p>Continuous – occurs continuously</p>
Reversibility	Pertains to whether a measurable parameter or the VC can return to its existing condition after the project activity ceases.	<p>Reversible - the residual impact is likely to be reversed after activity completion and reclamation.</p> <p>Irreversible - the residual impact is unlikely to be reversed.</p>

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20.1.6 Significance Definition

The threshold for determining the significance of impacts on infrastructure and services considers some of the elements for characterizing residual impacts presented in Table 20.1. The direction of residual impacts is important, as it provides information on the nature, positive or adverse, of the impact on the initial capacity of infrastructure and services at project implementation. The magnitude of the modification is also considered, since it refers to the change in capacity of services and infrastructure compared to existing conditions. The reversibility of the impact also contributes to determining the significance of the residual impact, since it illustrates the capacity or otherwise of infrastructure and services to return to their initial, pre-project conditions. On the other hand, the other elements of characterization (geographic extent, timing, duration and frequency), while important for a better understanding of when and where project impacts occur, do not reflect the capacity of services and infrastructure to cope or not with the possible increase in demand.

An adverse residual impact is considered high when demand for infrastructure and services exceeds current capacity and thresholds (high magnitude), leading to a reduction in service standards, and services and infrastructure are unlikely to return to their existing capacities before the project (irreversible).

On the other hand, the adverse impact is assessed as moderate if the scale of the change does not lead to a reduction in service standards, given that demand for infrastructure and services following the project is close to pre-project capacities and thresholds, and that the impact may therefore be reversible.

Finally, the residual adverse impact is low or negligible when the capacity of infrastructure and services under existing conditions and that under project conditions are similar, and the modifications are therefore reversible.

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20.2 Existing conditions

20.2.1 Methods

Existing conditions on services and infrastructure (housing and accommodation, utilities, health services and infrastructure, emergency services, education and childcare services and infrastructure, and transport services and infrastructure) are described, with a focus on those services and infrastructure that could be subject to project pressures.

Data collection has focused on information that will facilitate the assessment of the project's positive and adverse impacts, and that makes a significant contribution to the evaluation. For example, information on existing conditions includes descriptive information on services and infrastructure, as well as on the capacity to absorb additional demand. The main sources of information considered are as follows:

- The most recent statistical data from Statistics Canada's Census of Population and the Canada Mortgage and Housing Corporation (CMHC), as well as data from the Institut de la statistique du Québec (ISQ).
- Government databases from various Quebec ministries.
- Data and documentation available to the public.
- Secondary studies, plans and documents relevant to one or more of the socio-economic topics discussed.
- Local media (press articles and websites).

As required by federal guidelines, existing conditions are presented for subpopulations and population subgroups within the LSA/RSA that may be disproportionately impacted by the project, where such information is available. This information will contribute to a disproportionate impact analysis using GBA+. Sub-populations and sub-groups may include women, Indigenous nations, visible minorities, people with disabilities, youth and seniors, among others, as well as groups with an intersection of these characteristics.

To obtain information on sub-populations and sub-groups that could be disproportionately affected by the project, the results of project engagement and feedback from project stakeholders were reviewed. Concerns and issues raised by members of vulnerable groups were documented and informed the VC description and impact assessment.

20.2.2 Overview

20.2.2.1 Housing and temporary accommodation

Housing availability

Data on housing in the LSA/RSA taken from Statistics Canada at the time of the last census in 2021 is presented in Table 20.1.

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According to the Statistics Canada census, in 2021, the LSA/RSA will have 5,080 occupied private housing (Table 20.3). The town of Chibougamau has the most, with 3,190 dwellings, or 62.80% of total housing in the study area, followed by Mistissini (20.08%), Chapais (12.80%) and Oujé-Bougoumou (4.33%). Within the LSA/RSA, two trends can be observed in housing tenure. In Chapais and Chibougamau, most housing are owner-occupied (over 70%) and are essentially single-family homes. In contrast, in Mistissini and Oujé-Bougoumou, housing is mainly provided by the local government, First Nation or Indigenous governing body (over 60%) (Statistics Canada, 2023).

Access to housing has become an issue in recent years in Quebec, either because of high market prices or the unavailability of housing. Province-wide, the vacancy rate reached 1.3% in 2023 (CMHC, 2024), and property listings on the resale market fell by 43.3% between 2019 and 2023, despite a recovery in listings in recent years (Ministry of Municipal Affairs and Housing [MAMH], 2024). In terms of new construction, the economic context led to a significant decline in construction after a record number of starts in 2021 (Société d'habitation du Québec [SHQ], 2023). However, a recovery was observed in 2024 in urban centers with populations of 10,000 or more (Association des professionnels de la construction et de l'habitation du Québec [APCHQ], 2024).

In the Chibougamau and Chapais areas, however, housing availability remains low. Already in 2012, the City of Chibougamau recorded a vacancy rate of 0.93%, with a break-even point of 3% (Raymond Chabot Grant Thornton, 2012). According to a study conducted by the Abitibi-Témiscamingue-Ungava Technical Resource Group -(GRTATU) in 2020, the vacancy rate in 2019 was close to 0% in Chibougamau (GRTATU, 2020) and, according to Développement Chibougamau, would fluctuate between -3% and -6% in 2021 (Radio-Canada, 2021a). According to information available in the federal electoral district of Abitibi-Baie-James-Nunavik-Eeyou, although residential sales and active listings are higher between January and July 2024 compared to the same period in 2023, these records are still below the averages observed over the past five years (Canadian Real Estate Association [CREA], 2024). Also, in Chibougamau, decreases of 12% and 9% are recorded over a cumulative period of the last four quarters for residential home sales and new listings (Centris, 2024a). In Chapais, the number of transactions appears insufficient for analysis (Centris, 2024b).

Several projects have been initiated by the Quebec government to improve housing availability in the LSA/RSA. In 2021, the Quebec government announced an investment of \$7.25 million for the construction of two 20-unit buildings in Chibougamau to address the housing shortage and temporary settlement of workers (Radio-Canada, 2021b). In 2023, another government investment of around \$6 million was earmarked for the construction of 12 residences, including 6 units in Chapais and another 6 in Chibougamau (SHQ, 2023b). In addition, to alleviate the shortage of residential and rental housing, the City of Chibougamau is contributing to construction projects by setting up new residential developments, namely Quartier Ouest and Chemin Merrill. The Quartier Ouest residential sector includes over a hundred lots for single-family residential developments, while 11 lots are available for multi-family buildings in the Chemin Merrill sector (Ville de Chibougamau, 2024a). In its draft Urban Plan (2024b), the City of Chibougamau also foresees several actions to promote access to housing on its territory, such as continuing the subsidy program for the construction of multi-family dwellings and introducing incentives to encourage the renovation, rehabilitation and conversion of existing housing. As for Chapais, vacant spaces within the urbanization perimeter, many of them owned by the Town, are available for residential purposes (Town of Chapais, 2021).

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Affordability

In 2021, the average price of a home in the LSA/RSA, excluding Mistissini and Oujé-Bougoumou, was \$169,700, up by around 15% since 2016 when the average housing value was \$146,790. The town of Chapais saw the greatest increase in average housing value between 2016 and 2021, at 22.29%, while the increase was 12.03% in the town of Chibougamau (refer to Table 20.3) (Statistics Canada, 2023 and 2017).

According to the ISQ (2023), the share of Quebec households owning their own home dropped significantly between 2016 and 2021, from 61.3% to 59.9%, but the homeownership rate recorded in the Nord-du-Québec region is well below this, at 36%. According to the survey on reasons for leaving the James Bay region conducted by the Administration régionale Baie-James (ARBJ) among former residents of Chibougamau-Chapais, the fluctuations and unpredictability of the region's real estate market are deterrents to home ownership (ARBJ, 2024).

Rental market

Across Quebec, rent for a household rose from \$775 to \$886 between 2016 and 2021, an increase of 14.32%. However, rents in Chapais and Chibougamau remained below the provincial average over the same period. In terms of impact, the average rent for a rental unit in the two Jamesian communities of the LSA/RSA was \$637 in 2021, an increase of approximately 11% compared to 2016 (Statistics Canada, 2023) (table 20.3). No data was available for the two Cree communities.

There is little recent information on the number of rental units available in the study area. In Chibougamau, in 2012, 980 rental units were counted with a vacancy rate of 0.93% (Raymond Chabot Grant Thornton, 2012). GRTATU's technical and financial pre-feasibility study (2020) indicates that the few rental housing offers identified in Chibougamau did not offer complete units for rent, but rooms for rent. In impact, according to a survey conducted on the impacts of commuting in James Bay (Tremblay, 2020), employee commuting would affect housing availability by transforming dwellings into rooming houses accessible to commuters. Rising market prices would also be another impact of commuting (Tremblay, 2020).

The housing issue, both availability and affordability, is cited in the ARBJ survey as one of the causes of departure from the region and loss of the workforce, thus hindering the region's economic development.

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Table 20.4 Housing characteristics, LSA/RSA, 2016-2021 (Statistics Canada, 2017 and 2023)

	Chapais			Chibougamau			Mistissini			Oujé-Bougoumou			Quebec (province)		
	2016	2021	Change (%)	2016	2021	Change (%)	2016	2021	Change (%)	2016	2021	Change (%)	2016	2021	Change (%)
Total private housing	749	711	-5,07	3 538	3 557	0,54	1 068	1 210	13,30	279	277	-0,72	3 858 943	4 050 164	4,96
Occupied private housing	670	650	-2,99	3 255	3 190	-2,00	905	1 020	12,71	205	220	7,32	3 531 660	3 749 035	6,16
Detached single-family homes (%)	69,40	68,50	-0,90	48,70	50,50	1,80	66,90	63,70	-3,20	53,70	56,80	3,10	45,40	44,60	-0,80
Semi-detached (%)	7,50	3,80	-3,70	4,90	4,50	-0,40	16,00	17,60	1,60	24,40	22,70	-1,70	5,30	5,30	0,00
Owner (%)	82,00	76,20	-5,80	69,30	70,10	0,80	37,10	19,60	-17,50	37,50	18,20	-19,30	61,30	59,90	-1,40
Tenant (%)	18,00	23,80	5,80	30,70	29,90	- 080	43,50	20,60	-22,90	40,00	15,90	-24,10	38,60	39,90	1,30
Housing provided by local government/ First Nation/ Indigenous governing body (%)	0,00	0,00	0,00	0,00	0,00	0,00	19,50	60,30	40,80	25,00	65,90	40,90	0,20	0,20	0,00
Average value of owned homes (\$)	102 379	125 000	22,29	191 202	214 200	12,03	-	-	-	-	-	-	290 484	376 800	29,71
Average monthly housing costs for housing occupied by a tenant household (\$)	549	670	22,04	600	604	0,67	-	-	-	-	-	-	775	886	14,32

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Core housing need

The concept of "core housing need", as defined by Statistics Canada (2023), refers whether a households housing falls below at least one of the following thresholds for housing adequacy (not requiring any major repair), suitability (enough bedrooms for the size and composition of resident households, based on the National Occupancy Standard) or affordability (household spends less than 30% of its total before-tax income on shelter costs), and whether they would have to spend 30% or more of their total before-tax income to access other acceptable housing (meeting all three thresholds) in their community.

According to the survey conducted by the Institut de recherche et d'informations socioéconomiques (IRIS) on sustainable income in James Bay (2025), the housing stock in the two Jamesian towns in the LSA/RSA is more or less aging: over 85% of dwellings in Chapais and 69% in Chibougamau date from before 1980. In addition to the problem of housing availability on the market, it is also difficult to find affordable and suitable housing in these two towns. The IRIS survey (2025) identified a lack of large-sized housing units. The share of households in core housing need in the LSA/RSA is shown in table 20.4². The town of Chapais has the highest rate of households in core need, at 18% in 2021, despite a drop of 1.5 percentage points compared to 2016 (19.5%). This is three times higher than the provincial average (6%) in 2021. The city of Chibougamau, on the other hand, has a lower rate than the province, and in 2021 will have seen a drop compared to 2016, from 3.2% to 2.4%. In Chapais, in 2021, the main reason for pressing housing needs is their size, with a value multiplied by 7 between 2016 (2.3%) and 2021 (16%). In 2016, housing quality was the main cause of urgent need. In 2016 and 2021, housing affordability was the second most important factor. In Chibougamau, for both census years, 2016 and 2021, the main issue was housing affordability, despite the value dropping by 4.1 percentage points. This factor was followed by housing quality, then housing size, whose values remained roughly similar between 2016 and 2021 (Statistics Canada, 2017 and 2022).

Available data on housing indicators in the Cree communities of the LSA/RSA, Oujé-Bougoumou and Mistissini, focus solely on housing quality and size. Thus, in 2021, in Oujé-Bougoumou and Mistissini, respectively 25.6% and 20.5% of private dwellings required major repairs, while 23.3% and 19.0% of dwellings were deemed unsuitable in size (Statistics Canada, 2022).

² There is no information available on core housing need for the communities of Mistissini and Oujé-Bougoumou since, according to Statistics Canada's (2021) definition of "core housing need", "... Only private, non-farm, off-reserve and owner/renter households with positive income and a shelter cost-to-income ratio of less than 100% are considered in the assessment of "core housing need".

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Table 20.5 Rate (%) of Core Housing Need in the LSA/RSA in 2021 and 2016 (Statistics Canada, 2022)

	Chapais		Chibougamau		Oujé-Bougoumou		Mistissini		Quebec	
	2016	2021	2016	2021	2016	2021	2016	2021	2016	2021
% of households in core housing need ¹	19,5	18	3,2	2,4	*	*	*	*	9	6
Quality: % of households living in housing requiring major repairs	15	8,5	6,5	7,7	40	25,6	39,8	20,5	6,4	6,3
Size: % of households living in unsuitable housing	2,3	16	0,8	0,9	17,5	23,3	17,1	19,0	3,8	3,8
Affordability: % of households spending 30% or more of income on housing costs	10,5	14,7	12,7	8,6	*	*	*	*	21	16,1

1: "Owner and renter households with total household income greater than zero and shelter cost-to-income ratio less than 100% in private non-farm, non-reserve dwellings" (Statistics Canada, 2021).

Temporary housing

The LSA/RSA is in the Eeyou Istchee James Bay region, which includes the Eeyou Istchee tourism region that includes the communities of Oujé-Bougoumou and Mistissini, as well as the Baie-James tourism region that includes the towns of Chapais and Chibougamau.

For the year 2023, the towns in the Baie-James tourism region had 19 establishments and 387 available units, compared with a total of 15 establishments and 352 available units in 2022 (Gouvernement du Québec, 2024a). For the period January to September 2024, the number of available units is 499, a difference of 28.9% compared to the same period in 2023. The occupancy rate recorded up to September 2024 is 50.1%, which is like those observed for the same periods from January to September 2023 and 2022, i.e. 52.5% and 49.9%. (Government of Quebec, 2024a and 2024b)

For the Eeyou Istchee tourism region, 8 establishments and over 150 units were counted in 2023. In September 2024, the number of available units was 162. Eeyou Istchee's occupancy rate has been rising since 2022. For the January to September period, the rate was 47.1% in 2024, 40.4% in 2023 and 36.3% in 2022 (Gouvernement du Québec, 2024a and 2024b).

More specifically, the LSA/RSA has some 12 lodging establishments of the bed and breakfast, hotel and motel type, accommodating over 300 units and located mostly in the towns of Chibougamau and Chapais, with 9 and 2 respectively (TripAdvisor, 2024 and Tourisme Baie-James and Tourisme Eeyou Istchee, 2024). Several other categories of tourist accommodation, the vast majority of which are in Chibougamau, are offered in the LSA/RSA. This includes 4 establishments offering cottage rentals, 4 campgrounds accommodating up to 136 sites and 2 establishments offering unusual accommodation. In Chapais, only one cottage rental establishment and one campground with a capacity of 173 sites are known (Tourisme Baie-James and Tourisme Eeyou Istchee, 2024).

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Table 20.6 Temporary Housing in the LSA/RSA, 2024

Territories	Temporary accommodation facilities	Number of rooms
Chapais	Opemiska Hotel	12
	Motel Le Routier	19
Chibougamau	Gite de la Rivière	3
	Gite de l'Antre-temps	2
	Marina Chibougamau	*
	Motel Nordic Hotel	52
	Auberge chez Nancy	*
	Chibougamau Hotel	60
	Motel Harricana	100
	Relais Lac Cache	22
Mistissini	Auberge Mistissini Lodge	20
Oujé-Bougoumou	Auberge Capissisit Lodge	24

Note: The * symbol is used when information is not available.

Source: TripAdvisor, 2024 and Tourisme Baie-James and Tourisme Eeyou Istchee, 2024

Social housing

Across Quebec in 2021, available and affordable social housing provided accommodation for 3.5% of households, which was still insufficient, given that 50,700 households were on the waiting list. For the Nord-du-Québec administrative region, to which the LSA/RSA is attached, information on the portion of households residing in social housing is not available (ISQ, 2024).

The SHQ, the government agency responsible for housing, has a few programs to promote social and affordable housing, and between 2006 and 2023 it increased the number of social, community and affordable housing units by 32%. In 2023, its total housing stock is estimated at 271 units in the towns of Chapais and Chibougamau (Table 20.6) (SHQ, 2024). A total of 17 low-cost housing units were vacant in the LSA/RSA as of October 2023 (SHQ, 2023c). According to the IRIS survey on sustainable income in James Bay, the low-income housing (HLM) units in the town of Chapais had several spaces available at the time of the survey. In Chibougamau, HLM units are obsolete and undergoing renovation (IRIS, 2025).

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Table 20.7 Number of Social, Community and Affordable Housing Units in the LSA/RSA in 2023 (SHQ, 2024)

Territories	Number of Social, Community and Affordable Housing Units by SHQ program				
	HLM	PSL	LAQ	ACL	Total
Chapais	15	6	-	16	31
Chibougamau	232	8	-	-	240
Quebec (province)	74 353	38 325	8 563	38 142	138 516

Note: HLM: Low-Rental Housing; PSL: Shelter Allowance Program; LAQ: Affordable Housing Québec; ACL: AccèsLogis

* Households benefiting from both the PSL and ACL programs are counted only once (SHQ, 2024).

20.2.2.2 Utilities

Water and sanitation

In the LSA/RSA, all Cree towns and communities are served by a drinking water distribution network. The towns of Chapais and Chibougamau each have a drinking water production plant, the former supplied by groundwater and the latter by surface water (MELCCFP, 2024a). Table 20.7 summarizes these infrastructures and the uses of drinking water in these two towns. The communities of Mistissini and Oujé-Bougoumou rely on groundwater for their water supply. Between 2009 and 2011, the Cree Nation of Mistissini's aqueduct system distributed a maximal volume of 2,775 m³/day, while that of Oujé-Bougoumou distributed 418 m³/day (Neegan Burnside Ltd, 2011).

Table 20.8 Installation and Use of Drinking Water in the Towns of Chibougamau and Chapais

Territory	Nominal capacity of facility	Population served ¹	Quantity of water distributed - Weighted average (L/person/D) ¹	Average residential consumption (L/person/D) ¹	Volume of water distributed (ML/year) ¹
Chibougamau	33,480 m ³ /d ²	7 563	1 093	592	3 018,348
Chapais	*	1 766	2 167	518	1 396,406

*: information not available

Source:

1: Government of Quebec. 2024 c

2 : Médias Transcontinental S.E.N.C, 2012

As for wastewater, according to the interactive map in the Atlas de l'eau (MELCCFP, 2024b), only the town of Chibougamau has a wastewater treatment plant with an average flow of 12,465 m³/day (Ville de Chapais, 2022). Municipal wastewater from the town of Chapais is discharged into the municipal sewer and overflow system, which discharges wastewater directly into the environment, without any treatment (Ville de Chapais, 2021; Englobe, 2023). There are no septic tanks in the town of Chapais, and only isolated residences in resort areas have septic tanks, whose sludge is then sent to the Chibougamau

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wastewater treatment plant (Ville de Chapais, 2022). The town of Chapais is currently planning to build a wastewater treatment plant on its territory (La Sentinelle, 2023a; Ville de Chapais, 2021).

The communities of Mistissini and Oujé-Bougoumou have aerated lagoon treatment plants with a nominal capacity of 2,436 m³/day and 350 m³/day respectively, and a maximum daily volume of 1,417 m³/day and 337 m³/day (Neegan Burnside Ltd, 2011).

Landfill site

In terms of waste management in the LSA/RSA, each of the towns of Chapais and Chibougamau has an ecocenter, but only Chibougamau has an engineered landfill. Residual materials collected in Chapais are therefore transferred to the Chibougamau landfill site (Ville de Chapais, 2022). With a maximum capacity of 300,000 m³, this site receives residual materials from the town of Chapais, with an estimated residual capacity in 2019 of 174,087 m³ (Ville de Chibougamau, 2022 and BAPE, 2022).

In addition to the landfill, Chibougamau will have a new facility for the treatment of organic materials, which should also receive organic residues from the town of Chapais (La Sentinelle, 2023b and 2023 c). The planned capacity of the composting platform is 2,500 tonnes per year (Ville de Chibougamau, 2022). According to the project's initial schedule, organic material collection and operation of the platform are scheduled for spring 2025, once the necessary permits have been obtained (MELCCFP, 2024c). In February 2025, the City of Chibougamau was issued a certificate stating that the project was not subject to the environmental and social impact assessment and review procedure (MELCCFP, 2025).

For their part, the communities of Mistissini and Oujé-Bougoumou have landfill sites for residual materials. According to the Bureau d'audiences publiques sur l'environnement (BAPE) inquiry report on "L'état des lieux et la gestion des résidus ultimes" (2022), all Cree communities on the EIJBRG territory, with the exception of Whapmagoostui, have a trench landfill (LEET) to manage their residual materials, but most of these LEETs have reached or are nearing capacity. To counter this problem, several solutions and infrastructure projects for the disposal of residual materials have been put in place or are underway. In the community of Mistissini, for example, a new LEET site has been created in recent years and should be operational until 2041. This new site has an authorized capacity of 200,000 m³ and an estimated lifespan of 20 years. The community of Mistissini is the best equipped in terms of residual materials management infrastructure, since it also has an ecocenter and an organics management facility (BAPE, 2022).

20.2.2.3 Health and social services and infrastructure

Health care facilities

The LSA/RSA comprises two health regions: the Centre régional de santé et de services sociaux de la Baie-James (CRSSS) for the James Bay population, and the Cree Board of Health and Social Services of James Bay (CBHSSJB) for the Cree population. The CRSSS de la Baie-James provides health and social services in the Nord-du-Québec region. These centers are located in Chapais (Centre de santé René-Ricard) and Chibougamau (Centre de santé de Chibougamau), but there are also three others in Lebel-sur-Quévillon, Matagami and Radisson (CRSSS de la Baie-James, n.d. a). Some Jamesian

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patients requiring specialized services may also be transferred to Saguenay-Lac-Saint-Jean or Quebec City (CRSSS de la Baie-James, n.d. a).

The town of Chibougamau has three healthcare facilities: the Centre de santé (CS) de Chibougamau, the Long-Term Care Centre (CHSLD) Boréal and the Centre de protection et de réadaptation pour les jeunes en difficulté d'adaptation de Chibougamau (Ministère de la Santé et Services sociaux [MSSS], 2021). The CS de Chibougamau is closest to the Troilus mining project site, some 170 km to the south (Golder, 2020), and includes a hospital providing general and specialized care, a local community services center (CLSC), a CHSLD, and rehabilitation services for alcoholics, drug addicts and people with intellectual disabilities. The CS de Chibougamau has a total of 32 beds, including 30 for general and specialized care and 2 for residential and long-term care. The CHSLD Boréal has a capacity of 32 beds (MSSS, 2024a).

In 2023, the CRSSS de la Baie-James employed a total of 635 people. According to the CRSSS, medical staffing levels at the Chibougamau health center were below requirements, while the situation was stable at Chapais (CRSSS de la Baie-James, 2023). The number of general practitioners was 12 in 2023, divided between the health center and CHSLD Boréal, compared with 15 in 2022 (CRSSS de la Baie-James, 2023). However, the center has a permanent team of specialists in gynecology-obstetrics, internal medicine, surgery and anesthesia (CRSSS de la Baie-James, 2023), and also offers consultations in psychiatry, cardiology, gynecology, nephrology, ENT, orthopedics, pediatrics, pneumology, radiology and urology (CRSSS de la Baie-James, n.d. b). In Chapais, the CS René Ricard offers general and specialized care services, a CLSC for alcohol and drug rehabilitation and rehabilitation for people with intellectual disabilities (MSSS, 2024a) and employs (end March 2023) four people (CRSSS de la Baie-James, 2023). According to the results of the survey conducted by IRIS in 2025, the CS de Chibougamau and the CS René-Ricard employ 20 and 5 family physicians respectively,

As for services and residences for the elderly, apart from the CS de Chibougamau and the CHSLD Boréal, the LSA/RSA has three private residences for the elderly. Two of these are located in Chibougamau: the 48-unit Manoir Providence (MSSS, 2024b) and the 23-unit Jardin des Aînés residence managed by the Association des personnes en perte d'autonomie de Chibougamau (Ville de Chibougamau, 2025) (MSSS, 2017). Chapais is home to the Le Manoir Pierre-Guénette residence for seniors and people with loss of autonomy, with a capacity of 16 units (Ville de Chapais, 2013), many of which will still be available for rent in 2024, when IRIS conducts the James Bay sustainable income survey (2025).

In the Cree communities of the LSA/RSA, the CBHSSJB, created in 1978 under the JBNQA, administers these services in Eeyou Istchee, with its head office in Chisasibi and its regional public health department in Mistissini. It manages the Community Miyupimaatsiun Health Centers (CMC), the equivalent of the Centres intégrés en santé et services sociaux (CISSS) elsewhere in Quebec, which are present in each of the Cree communities. These centers offer services in general medicine, mental health, home and community care, dentistry, pharmacy, as well as social (including youth protection) and paramedical services. The CBHSSJB also manages the Chisasibi regional hospital, which serves the nine Cree communities of Eeyou Istchee, including Mistissini and Oujé-Bougoumou. The hospital has 29 beds, including 17 for acute care (5 for pediatrics), 9 for chronic care and 3 for respite care. With a medical team comprising 7 doctors and 27 registered nurses, the hospital provides primary and secondary health care. Some specialized services are offered through a partnership with the Réseau universitaire intégré

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de santé et services sociaux (RUISS): telemedicine in obstetrics, surgery, pediatrics, orthopedics, internal medicine, ophthalmology, otolaryngology and psychiatry (CBHSSJB, 2024a and 2024b). Some patients requiring specialized services may also be transferred to Abitibi-Témiscamingue or Montreal (CRSSSBJ, n.d.). According to announcements made in 2019, a new Eeyou-Eenou regional health center in Chisasibi is currently under construction and will eventually replace the outdated hospital. The new regional health center will house a 52-bed hospital for the population of Eeyou Istchee, the Miyupimaatisiun center for the local population of Chisasibi (CBHSSJB, 2019).

The CBHSSJB is also responsible for the network of multi-service day centers (MSDC³), which cater to people in social isolation, seniors, adults with special needs and people with mental health problems. In all Cree communities, MSDCs are places of gathering, healing and learning, where a variety of activities are offered, including exercise, creative activities, traditional activities and hot lunches.

Mistissini residents benefit from Miyupimaatisiun, an MSDC and the Eeyou Istchee Rehabilitation Centre. In addition to the usual services provided in all communities, Mistissini's Miyupimaatisiun Centre includes a hemodialysis unit. The Oujé-Bougoumou community benefits from the services of the Oujé-Bougoumou CMC Healing Center and the Oujé-Bougoumou MSDC (CBHSSJB, 2024 c and 2024 d). It should be noted that a project to construct a new building for the Oujé-Bougoumou MSDC is currently in the planning stages (Government of Quebec, 2025a), while an Elders and Alternative Home is scheduled to open in the community of Mistissini by the end of 2026 (Government of Quebec, 2025b). The planned capacity of this facility is 33 places.

As for mental health resources, in addition to the services offered by the CRSSS de la Baie-James and the MSDCs of the Cree communities, the Corporation le Zéphir Chibougamau-Chapais, located at Chibougamau, offers a number of mental health services and support (day center, lodging, self-help group, assistance for loved ones, etc.) (Le Zéphir, 2025).

The Jamesian and Cree health services are facing a number of challenges in terms of workforce availability, and thus maintaining the services offered. In 2021, the Centre de santé de Chibougamau had to close one of its services due to a lack of nurses, while the Mistissini CMC also reduced its hours and services offered in 2022, due to a lack of personnel (CBHSSJB, 2022b). This issue of recruitment, and therefore resource availability in the healthcare sector, was also raised in the IRIS survey (2025).

Police force and emergency services

The Sureté du Québec provides police services in the LSA/RTA from the Chapais-Chibougamau station located in the town of Chibougamau. The Cree communities, including Mistissini and Oujé-Bougoumou, have their own Eeyou-Eenou municipal police forces covering all their respective territories (Données Québec, 2024 and Grand Council of the Crees (Eeyou Istchee) / Cree Nation Government, 2024a). In 2023, the crime severity index (CSI)⁴ for the Chapais and Chibougamau region was 114.16, down 5.2%

³ Multiservice day care

⁴ The Crime Severity Index (CSI) measures variations in the severity of crime in Canada from one year to the next. It complements the crime rate, which measures only the volume of crime reported to police per 100,000 population. The severity level is based on sentences currently handed down by the courts in all provinces and territories (Statistics Canada, 2024).

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from the previous year. The weighted violent crime clearance rate also decreased by approximately 42% between 2022 and 2023. The year 2022 was the year with the highest recorded CSI between 2019 and 2023. In terms of number of crimes, crimes against persons and property are on the rise in the territory served by the Chapais and Chibougamau substations between 2019 and 2024. For the period from April 2023 to March 2024, 330 crimes against the person and 179 crimes against property were recorded by the Chapais-Chibougamau station, an increase of approximately 49% and 7% respectively compared to the periods between 2019 and 2020 (Sureté du Québec, 2023).

It should be noted that work is underway to construct a new building for the Chibougamau police station (Gouvernement du Québec, 2025c).

In Mistissini, from 2002 to 2010, the years for which statistics are available, the CSI averaged around 205, reaching a minimum value of 100.07 and a maximum value of 279.14 (Statistics Canada, 2024). There are no Statistics Canada-recorded CSI data for Oujé-Bougoumou.

As for emergency services, a fire station is located in each of Chapais and Chibougamau (Données Québec, 2024). The Chibougamau fire station has 24 trained firefighters plus staff, while the Chapais station has around ten firefighters plus staff (Ville de Chapais, n.d. and Ville de Chibougamau, 2024 c). For forest fires, the Société de protection des forêts contre le feu (SOPFEU) station at the Chibougamau airport is the closest. This is part of the Central Regional Branch, which is managed from Roberval. In the event of force majeure, a regional Sécurité civile office is also present on the territory, coordinating efforts from Chibougamau. The communities of Mistissini and Oujé-Bougoumou also have fire departments (Grand Council of the Crees (Eeyou Istchee) / Cree Nation Government, 2024b and CBHSSJB, 2024c). For pre-hospital emergency services, a total of four vehicles are in service. Two emergency vehicles are located in Chibougamau, covering the Municipality and Route du Nord, one vehicle in Chapais covering the Municipality and Route 113, and finally one vehicle is located on the Ashuapmushuan reserve for deployment on Route 167. Jamesian first responder services collaborate with those of the Cree communities to respond to emergencies on the territory. (CRSSS de la Baie-James, n. d.)

CMCs in the Eeyou Istchee territory, including those in the Mistissini and Oujé-Bougoumou communities, as well as in the Chisasibi regional hospital, offer emergency medical services. CMCs in the LSA/RSA, and throughout Eeyou-Istchee, offer air medical evacuation services. Urgent cases requiring interventions outside their communities are transferred outside their community to the regional hospital, or even outside the Eeyou-Istchee territory. For communities without an airport, such as those in the LSA/RSA, transfers are made from the Chibougamau airport (CBHSSJB, 2020 and 2022a).

As with the health service, the Chapais and Chibougamau pre-hospital emergency service also seems to be facing a shortage of manpower, having had to operate at half its potential for the year-end 2021 period (La Sentinelle, 2022).

Social services

There are two shelters for women and their children who are victims of domestic violence in Eeyou-Istchee, but neither is located in the LSA/RSA. The shelter serving the LSA/RSA population is located in the community of Waswanipi and has 18 beds. The second shelter is located in Waskaganish and serves the Cree coastal communities (CBHSSJB, 2024th et. Cree Nation Government, n.d.). The Centre d'aide

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aux victimes d'actes criminels (CAVAC), CAVAC Cri, also has two reception points in the Cree territory of the LSA/RSA: Oujé-Bougoumou and Mistissini (CAVAC, 2024). CAVAC de la région du Saguenay-Lac-Saint-Jean has a help center in Chibougamau (CAVAC, 2025). For abused women and their children in Chibougamau, only one shelter, Maison d'hébergement l'Aquarelle, exists in the city, but no shelters appear to be listed in the town of Chapais (Association féminine d'éducation et d'action sociale [Afeas], 2020). Two women's centers, Les Elles du Nord in Chibougamau and Les Essentielles in Chapais, offer various services to support abused women (CALACS-ABITIBI, n.d.). The Maison Oxygène Raymond-Ross, a residential resource for fathers and children, as well as for men in difficulty, is part of the Hommes Québec Baie-James network and is available in Chibougamau (MSSS, 2025).

The City of Chibougamau also has on its territory the Carrefour Communautaire de Chibougamau, which offers several services aimed at ensuring food security for the population of Chibougamau, Chapais and surrounding areas, including collective kitchens, food banks and distribution. The organization recovers and redistributes a wide range of foodstuffs. It already has several collaborators and is actively seeking new projects in this area. (Carrefour Communautaire, 2023 and 2024)

20.2.2.4 Education and childcare services and infrastructure

Education services

In the Nord-du-Québec region, the Centre de services scolaires de la Baie-James (CSSBJ) comprises eight preschools and elementary schools and five high schools. The LSA/RSA has four primary preschools, three in Chibougamau and one in Chapais, and one secondary school in each municipality (Table 20.8). Of these four preschools and primary schools, only three had a full-time kindergarten class (age 4) in 2023-2024 (École Notre-Dame-du-Rosaire and École Bon-Pasteur in Chibougamau and École Saint-Dominique-Savio in Chapais) (Ministère de l'Éducation, 2024a). For the next school year, due to staff shortages, only the Chapais facility is expected to remain open (Radio-Canada, 2023). According to August data, in 2024, 46 positions are to be filled by the various CSSBJ organizations throughout the Nord-du-Québec region, including 15 teaching positions and 31 support staff positions, i.e. 9.1% and 39.2% of positions to be filled respectively. In November 2024, 7 teaching positions, 5 specialized education technician positions and one school-based educator position were still available (Ministry of Education, 2024b). An adult education center completes the CSSBJ's general educational service offering (CSSBJ, 2024).

Chibougamau is also home to the MacLean Memorial School, part of the Commission scolaire centrale Québec. This school offers English-language courses and welcomes a large number of students from the Cree population. The school accommodates around 250 students from elementary to high school (Central Quebec School Board, 2021).

Post-secondary education services include the Centre de formation professionnelle de la Baie-James (CFPBJ) and the Centre d'étude collégiale de Chibougamau (CEC Chibougamau) affiliated with the Cégep de Saint-Félicien (CSSBJ, 2024).

In addition to their main office in Chibougamau, the Centre de formation professionnelle de la Baie-James (CFPBJ) offers training at two other locations (Matagami and Lebel-sur-Quévillon). Four vocational training programs are offered, including the Mine/worksites program. This program offers four diplomas of

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vocational studies (DVS) programs in the mining industry, three of which are currently available, namely ore extraction, ore processing machine operation and drilling-dynamiting, while the diamond drilling DVS program is not available (CFPBJ, n.d.). CEC Chibougamau also offers eight training programs: three pre-university, four technical and one integration (CEC Chibougamau, n.d.). For the 2022-2023 year, the CEC welcomed 71 students, including 62 from the Nord-du-Québec region (CÉGEP de Saint-Félicien, 2023).

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Table 20.9 Educational Institutions in the LSA/RSA

Territory	Schools ¹	Level of education ¹	Student attendance ²	Enrolment to 30 /11/ 2021 ³
Chibougamau	Vatican II School	Preschool and elementary	250	211
	École Bon-Pasteur	Preschool and elementary	150	140
	École Notre-Dame-du-Rosaire	Preschool and elementary	220	220
	MacLean Memorial School	Preschool, elementary and college	250	*
	École La Porte-du-Nord	Secondary	*	386
	Centre d'études collégiales in Chibougamau	College	*	*
	Centre de formation générale des adultes de la Baie-James	Adult education	*	*
	James Bay Vocational Training Center	Vocational training	*	*
Chapais	École Saint-Dominique-Savio	Preschool and elementary	150	117
	École Le Filon	Secondary	100	57
	Centre de formation générale des adultes de la Baie-James	Adult education	*	*
Mistissini	École Élémentaire Mémoire Voyageur	Preschool and elementary	600	*
	Mémoire Voyageur High School	Secondary	408	*
	Sabtuan Adult Education Center (Mistissini - Inland)	Adult education	*	*
	Sabtuan Vocational Training Center (Mistissini - Inland)	Vocational training	*	*
Oujé-Bougoumou	Waapihtiwewan School	Preschool - Primary - Secondary	152	*
	Sabtuan Adult Education Center (Mistissini - Inland)	Adult education	*	*
	Sabtuan Vocational Training Center (Mistissini - Inland)	Vocational training	*	*

Source:

1: Ministry of Education, 2024a

2: CSSBJ, 2024: Commission scolaire, Central Québec, 2021; CSC, 2024 b

3: CSSBJ, 2022

*: information not available

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For the Cree communities of the LSA/RSA, the Cree School Board (CSB), created in 1978 under Section 16 of the JBNQA, manages education services in the territory of Eeyou Istchee, ensuring the preservation of Cree culture. It is responsible for elementary, secondary and adult education programs, and provides financial and social support to students pursuing post-secondary studies. Its head office is in Mistissini. In September 2022, the CSB had a clientele of 5,259 primary and secondary students, 257 adult students and 456 post-secondary students (CSB, 2024a).

Adult education services, grouped under the name Sabtuan, are offered in each community. In addition, the regional vocational training center, based in Waswanipi, offers various programs in a well-equipped facility, as well as accommodation in the community for students (CSB, 2024). The Support for Assistive Services program will be offered there in the fall of 2024.

In the LSA/RSA, Mistissini has an elementary school, Voyageur Memorial Elementary School, and a high school, Voyageur Memorial High School, with 600 and 408 students respectively as of February 2020. There is also a Sabtuan vocational training center. The following programs will be offered in Mistissini in 2024-2025: auto mechanics, carpentry, accounting, business start-up, orderly and general training. No college or university training is offered in the community (CSC, 2024b). Oujé-Bougoumou has one school, Waapihtiwewan School, with 152 students in 2020, as well as a Sabtuan center for comprehensive and vocational adult training. General training and carpentry programs will be offered in Oujé-Bougoumou for 2024-2025 (CSC, 2024 b). No college or university training is offered in the community. Apatisiwin Skills Development (ASD) was founded by the Cree Nation Government (CNG) to support Cree workers in their job search and long-term employability development. ASD offers training, employment preparation and skills development programs, as well as coaching and financing for those wishing to pursue specific accredited training or an apprenticeship program. The organization has offices in each of the Cree communities and has established its coordinating office in Mistissini (ASD, 2024).

Childcare

The town of Chapais has one early childhood center (CPE) with a capacity of 45 places, while Chibougamau has three with a total of 198 places. The community organization Mirador des Marmots in Chibougamau also offers childcare services (Ministère de la Famille, 2024).

Childcare services in the LSA/RSA in the James Bay region do not appear to be satisfactory, and the lack of childcare spaces is cited as one of the reasons for departure (ARBJ, 2024) and one of the reasons for the difficulty in filling vacant positions (ARBJ, 2022). As IRIS (2025) points out, Chibougamau's daycare occupancy rate is 100%, with many children on waiting lists, while the situation is less critical in Chapais, where the occupancy rate is 87%.

In the Cree communities of the LSA/RSA, early childhood and family services were created following the signing of the first agreement on early childhood services with Quebec's Ministère de la Famille. Since then, 16 CPEs have served the Cree communities, including 3 CPEs in Mistissini with a capacity of 230 places, and one CPE in Oujé-Bougoumou with a capacity of 70 places.

On the other hand, the federal government has three Indigenous Early Learning and Child Care (ELCC) programs, namely the First Nations and Inuit Child Care Initiative, administered by Employment and Social Development Canada (ESDC), Indigenous Head Start On Reserve, administered by Indigenous

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Services Canada (ISC), and Indigenous Head Start in Urban and Northern Communities, administered by the Public Health Agency of Canada (AHSUNC) (EDSC, 2023). The objective of the funding provided to Indigenous communities through these programs is to provide Indigenous children with quality, culturally appropriate preschool and daycare services. For example, thanks to this program, the Cree Nation Government has been able to develop a training program and culturally relevant tools to enable educators to offer activities based on Cree culture and language (EDSC, 2024). Several other federally funded programs are also available to the Grand Council of the Crees to support childcare offerings and CPE activities, such as the Cree Early Childhood Program, Head Start and the Maternal and Child Health Program (Grand Council of the Crees (Eeyou Istchee) / Cree Nation Government, 2025).

With the changing work patterns of Indigenous families and the increasing proportion of Indigenous women in the job market, particularly in mining, childcare and education services must adapt. The lack of daycare spaces may also be an issue in the indigenous communities of Mistissini and Oujé-Bougoumou, especially as Troilus is keen to encourage recruitment in indigenous communities, particularly of women.

20.2.2.5 Transportation services and infrastructure

Road network

The RSA is served by three main roads: Route du Nord, Route 167 and Route 113.

The Route du Nord, classified as a local, unpaved road, provides access to the southeastern portion of Eeyou Istchee. 405 km long, it criss-crosses the territory between Route 167 (about 15 km northeast of Chibougamau) and Kilometre Point (KP) 275 of the Billy-Diamond highway, located north of the Rupert River. Inaugurated in 1993, this road was built to provide access to the territory covered by the Eastmain-1 and Eastmain 1-A-Rupert hydroelectric developments. During its previous operation, the Troilus Mine used the Route du Nord. Various options for upgrading and paving the Route du Nord were examined as part of the La Grand Alliance feasibility studies (LGA, 2024).

Route 167, classified as a national highway and paved along its entire length, connects the region to the Saguenay-Lac-Saint-Jean region, providing the road link between Mistissini and Saint-Félicien, via Chibougamau. Route 167 runs to the Renard mine site, operated by Stornoway. For the last 100 km to the mine site, the road is classified as a "resource access road". A load limit is in effect. The upgrading and extension of Route 167 has also been studied as part of LGA (2024).

Route 113, classified as a national highway, is the east-west road transport axis between Lebel-sur-Quévillon and Route 167, near Chibougamau. It connects the region to Abitibi-Témiscamingue beyond Lebel-sur-Quévillon, and continues to Route 117, near Val-d'Or. A load limit is in effect.

In addition to these major roads, the 16-km paved Mistissini access road links the community to KP⁵ 304 of Route 167 (Cree Development Corporation [CDC], 2024). One section of the road is under the jurisdiction of the Ministry of Transport and Sustainable Mobility (MTMD) and the other under the jurisdiction of the Cree community of Mistissini (LGA, 2024; Mistissini, 2020). The Oujé-Bougoumou Meskino road leading from Route 113 to Oujé-Bougoumou, via Route R1009, is paved and 23.5 km long

⁵ Kilometre point

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(LGA, 2024). All these roads in the study area come under the MTMD's Chibougamau service center (2024a).

The Troilus mining project site is accessible by road from Chibougamau, Chapais and Mistissini. The junction to the Troilus mining project site is located around KP 108 on the Route du Nord.

In the Eeyou-Istchee James Bay region, the most heavily used road segments are between the towns of Chibougamau and Chapais (LGA, 2024). Map 20.2 shows the location of road segments that could be used for mine operations, while Figure 20.1 shows the evolution of traffic flows between 2017 and 2023 (MTMD, 2024).

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Based on the available data, traffic flows are highly variable in the LSA/RSA. In 2022, the year for which average annual daily traffic (AADT) data are available for all sections, Route du Nord between the Troilus mine and Route 167 Nord (section a) has the lowest traffic volume, with an AADT of 260 vehicles. Traffic then increases on Route 167 North towards Chibougamau, with an AADT of 1,160 vehicles on the Route 167 North - Campbell Road section (section c) and 1,470 vehicles from the intersection with Campbell Road to Chibougamau (section e). Although old, the available data suggest that the proportion of heavy vehicles using the Route du Nord is significant (33% in 2013 and 22% in 2003), while it is lower at the southern limit of the town of Chibougamau (12% in 2002 on section c) and 12% in 2006 on section e). The Chibougamau bypass via Campbell Road is less busy, with an AADT of 70 vehicles in 2020. At that time, trucks accounted for 24% of traffic.

Traffic volumes are then highest on the major routes of Route 167 South from the southern boundary of the town of Chibougamau, and Route 113 leading to Chapais and Oujé-Bougoumou, with respectively an AADT of 3,800 vehicles along section f) and 1,970 vehicles along section g). Truck traffic is also highest on these roads, with 14% (in 2022) and 20% (in 2023) of trucks respectively.

As Mistissini is the second most populous community in the LSA/RSA after Chibougamau, traffic is relatively heavy, with an AADT of 740 vehicles on section b). Along the road leading to Oujé-Bougoumou, traffic is lower, with 440 vehicles recorded on section h). Trucking on these sections is restricted according to MTMD's trucking network class, with 8% recorded on Route 167 North leading to Mistissini in 2003 (section b), and 11 and 12% in 2022 and 2023 along Route 1009 (section h) (MTMD, 2024b).

In conclusion, the evolution of road flow over the past few years indicates a trend towards increased traffic in the LSA/RSA, which is also representative of the increase in the number of vehicles on the road throughout Quebec.

Section a): Route du Nord, from Mine Troilus access road to Route 167 North

Traffic volume on Route du Nord is relatively low in the LSA/RSA area but has been increasing in recent years. On impact, according to MTMD data (2024b), traffic flow increased from an AADT of 100 vehicles per day in 2017 to 250 in 2018. Traffic flow then fluctuated little, between 250 and 260 vehicles per day between 2018 and 2022. In summer and winter, the same trend is observed for average summer daily traffic (ASDT) and average winter daily traffic (AWDT). It should be noted that in 2013, the proportion of heavy vehicles on Route du Nord was 33%, which is considered high.

Section b): Route 167 Nord, from its intersection with Route du Nord to Mistissini

Along Route 167 to its intersection with Rue Principale leading to Mistissini (section between Route du Nord [KP 252] and its intersection with Route Lac Mistissini, Gauvin [KP 304.7]), the AADT varies between 700 and 780 vehicles per day between 2017 and 2023, with a decrease in traffic volume recorded in 2020 and 2021 (AADT of 660 and 640). During the summer months, traffic along this stretch of road is more significant, and has increased since 2017 from 760 to 840 vehicles per day. Heavy-vehicle traffic is restricted on this stretch of road. No recent data on the percentage of truck traffic is available. In 2002 and 2003, the proportion of heavy vehicles recorded along Route 167 was 8% and 10% respectively.

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Section c): Route 167 North to Campbell Road

On this stretch of road between Campbell Road, Chibougamau (KP 238) and Route du Nord, Chibougamau (KP 252), traffic flow has been more or less stable over the years. According to the latest available data from MTMD, the AADT and ASDT will be 1140 and 1230 respectively in 2022. No recent data on the percentage of truck traffic is available. According to 2002 data, the proportion of heavy vehicles recorded along Route 167 was 12%.

Section d): Campbell Road

This section of road bypasses the town of Chibougamau. It carries less traffic than Route 167 North from its intersection with Route du Nord to the town of Chibougamau [sections c) and e)]. The recorded AADT is stable between 2017 and 2023, at 70 vehicles per day. The proportion of heavy vehicles using this route is significant, with 24% trucks in 2020. In summer, the ASDT is 80 vehicles per day for the same years.

Section e): Route 167 North to Chibougamau

Traffic volume on this section is stable between 2017 and 2023 but has the highest AADT and ASDT along the various sections of Route 167 North in the LSA/RSA. The recorded AADT and ASDT are 1470 and 1590 for the two years 2022 and 2023. No recent data on the percentage of trucking is available. In 2006, the percentage of heavy vehicles using this route was 12%.

Section f): Route 167 South to Route 113

This section of the LSA/RSA has the highest AADT and ASDT values in the LSA/RSA. Between 2017 and 2023, the AADT varies between a minimum value of 2,800 (in 2022) and a maximum of 4,600 (in 2021). Summer traffic is heavier than the rest of the year, with a maximum ASDT value of 4,600 vehicles recorded in 2019. On this section of Route 167 South, the proportion of heavy vehicles was 13% in 2019 and 14% in 2022.

Section g): Route 113 to Chapais

From the intersection of Route 167 South and Route 113, traffic volume drops in relation to traffic flow on Route 167 South. The AADT on this route 113 leading to Chapais varies between a minimum of 2,170 (in 2023) and a maximum of 2,400 (in 2019). The recorded ASDT varies between a minimum of 2,350 (in 2023) and a maximum of 2,590 (in 2019). It should be noted, however, that annual and summer traffic flows fell in 2022 compared with previous years and with 2023. The AADT and ASDT were 1,970 and 2,130 vehicles in 2022.

This section of the LSA/RSA road carries the highest number of trucks, reaching a maximum proportion of 20% in 2023. Section h): Route 1009, from the intersection with route 113 towards the community of Oujé-Bougoumou:

On this stretch of road leading to the community of Oujé-Bougoumou, traffic flow between 380 vehicles per day in 2017 and 540 vehicles per day in 2023. Summer traffic is higher, at 410 and 580 vehicles per

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day for 2017 and 2013 respectively. According to the MTMD trucking network class, truck traffic on this section is restricted. The percentage of trucks using this road in 2023 is around 12%.

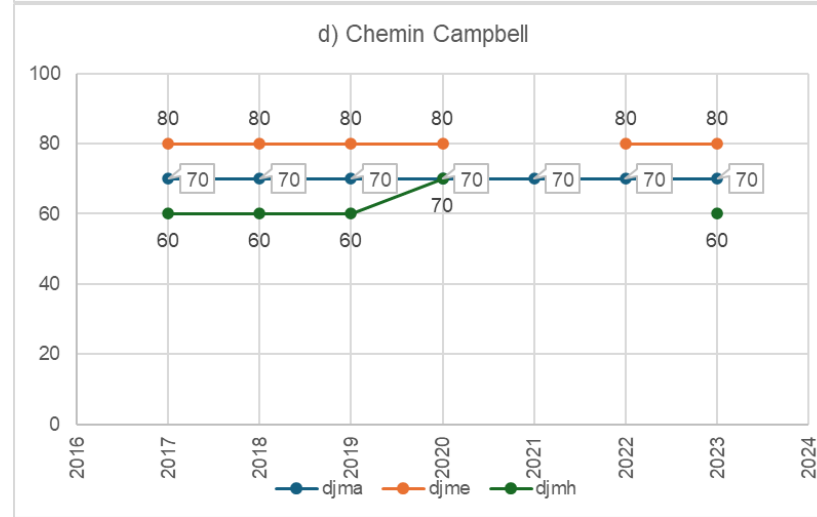
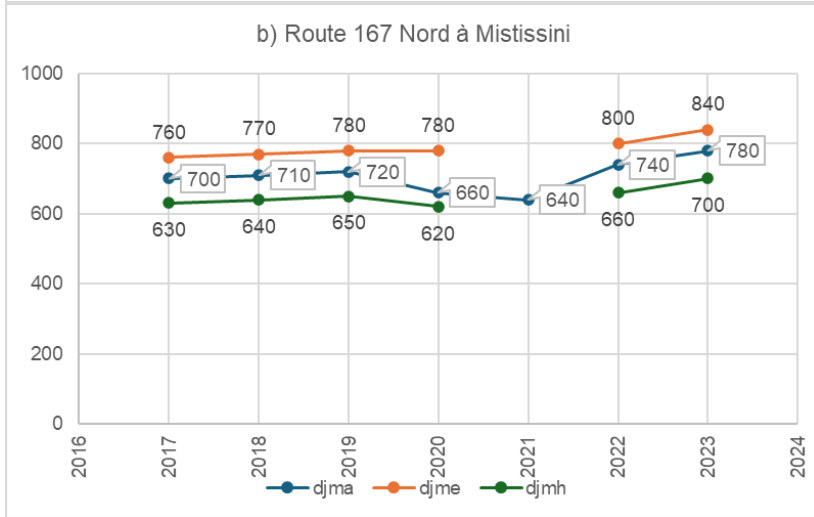
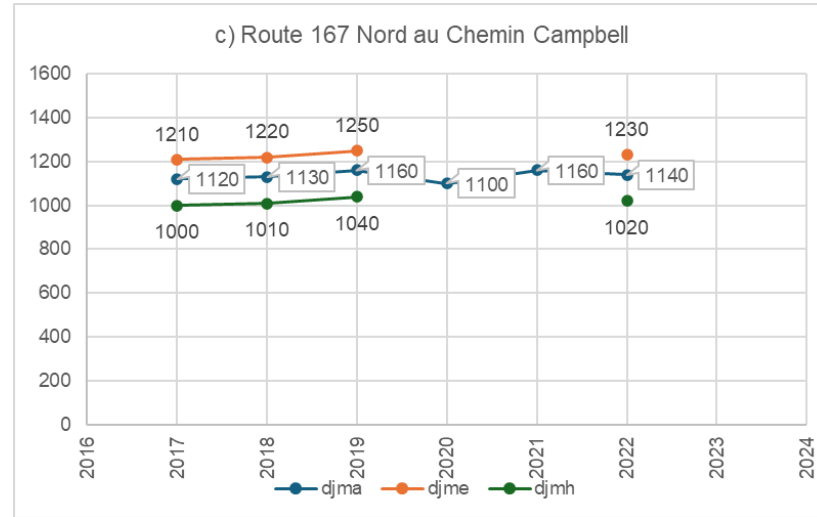
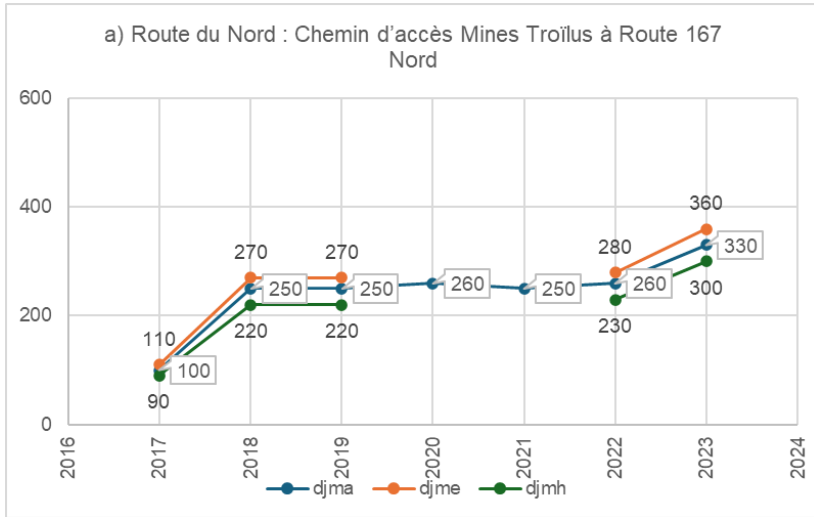
In terms of road safety, the Nord-du-Québec region recorded a total of 298 accidents in 2022 (84,086 for the whole of Quebec), including 4 fatal accidents, 12 serious accidents, 65 minor accidents and 217 material accidents. The total number of accidents recorded in 2022 represents a decrease of approximately 19% compared with the average number of accidents between 2017 and 2021 (Société de l'assurance automobile du Québec [SAAQ], 2024). In 2023, 273 accidents were recorded in the Nord-du-Québec region, representing a decrease of approximately 8% compared to 2022. Seven deaths were recorded among the 104 people involved in accidents for the same year ([Interactive map - SAAQ](#)).

Between April 2019 and April 2024, the Chapais-Chibougamau police station serving the study area recorded no fatal accidents. However, 85% of collisions involved property damage, while collisions with minor injuries accounted for 18% of recorded accidents, and only 1% of accidents involved serious injuries. Furthermore, over the last year (April 2023 to April 2024), a total of 88 accidents, including 2 accidents with serious injuries, 21 with minor injuries and 65 accidents involving property damage, were recorded (Sûreté de Québec, 2023).

As indicated in section 2.1.5, which deals with the route variants studied for off-mine-site transportation, Route du Nord and Route 167 North towards Chibougamau are likely to be the two most frequently used sections for mine transportation needs (goods, employees and concentrate). Table 20.10 shows the number of collisions between 2015 and 2024 on these two road sections, by type of damage (physical or material) and severity. Route 167 Nord appears to be the least safe, with a higher number of accidents during the same period (97 accidents) than Route du Nord (29 accidents). It should be noted, however, that around 65% of accidents recorded on Route 167 Nord, and 14% of those on Route du Nord, were material collisions, followed by collisions with minor injuries, at 27% and 13% respectively. One fatal accident was recorded on each of these roads during this 10-year period.

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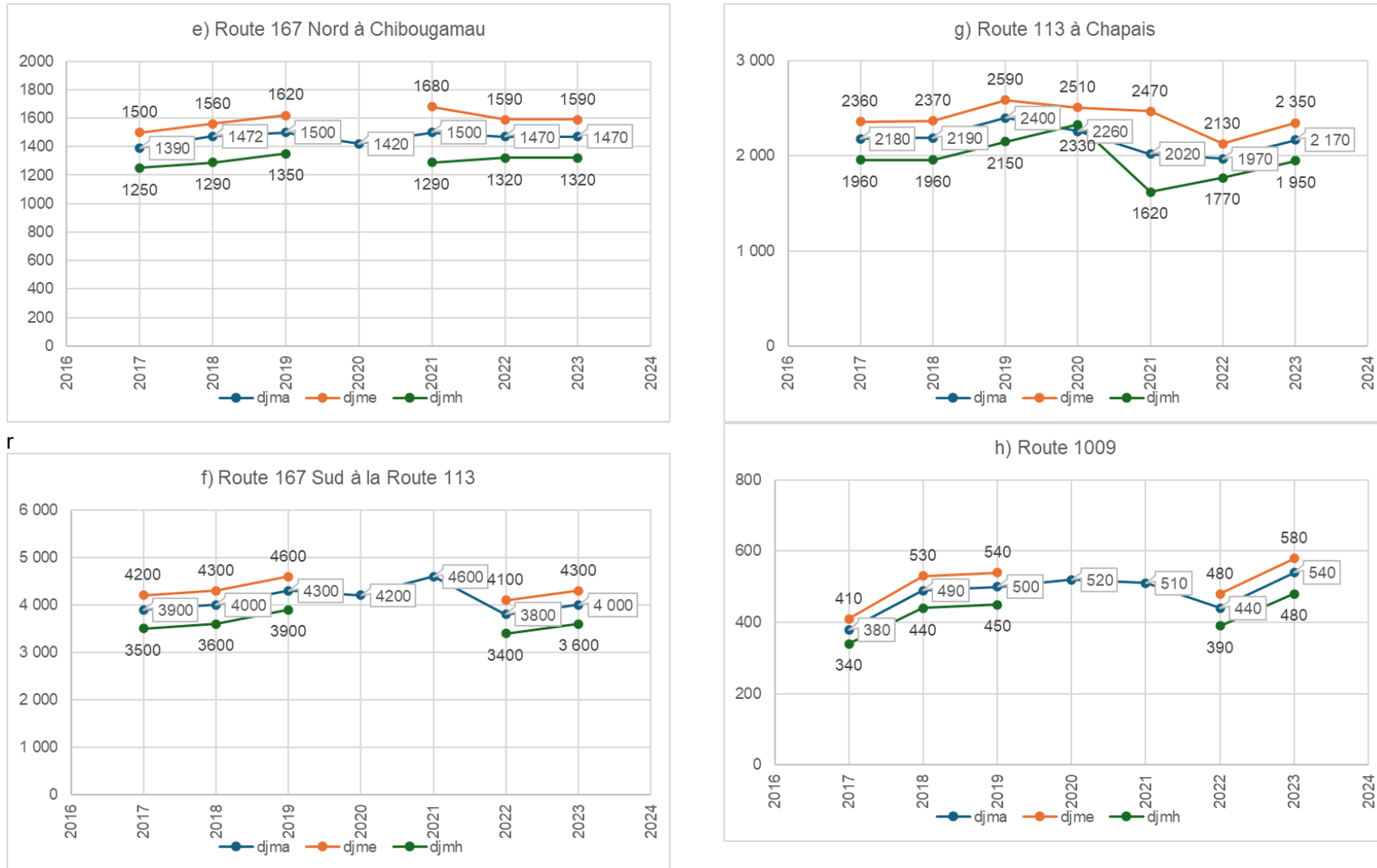


Figure 20.1 Evolution of Road Traffic Flow Between 2017 and 2023 in the LSA/RSA (MTMD, 2024)

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Table 20.10 Number of Accidents by Severity (MTMD, 2025)

Road section	Number of Accidents				
	Fatal	Serious	Minor	Material Damage	Total
Route du Nord*	1	1	13	14	29
Route 167 North	1	6	27	63	97

* Section corresponding to Route du Nord from intersection with Route 167 Nord (Km 0) to Alanel substation (km 258)

Forest roads

Numerous logging roads criss-cross the LSA/RSA. Along the Route du Nord, several multi-use logging roads connect to this road, including logging road R1047, which is the access road to the Troilus mine site. Several other forestry roads, most of which are suitable for motorized vehicles, branch off from this main road and extend to the various lakes surrounding the PDA. The PDA is also criss-crossed by drivable and non-drivable roads used as winter trails. Within the LSA/RSA, forest road R1029 links Route du Nord to Oujé-Bougoumou. These roads are under the jurisdiction of the MRNF (MTMD, 2024a).

Bus and commercial transportation

Two bus services are available to residents. Intercar offers passenger service between Chibougamau and Saguenay-Lac-Saint-Jean, with one trip per week between Saint-Félicien and Chibougamau (Intercar, 2024). Autobus Maheux serves the corridor from Route 113 to Route 117 in Abitibi-Témiscamingue, and the corridor formed by Routes 109 and Billy-Diamond. Autobus Maheux also serves the Abitibi-Témiscamingue region, including connections to Montreal and North Bay. The company serves the LSA/RSA through its Val-d'Or-Chibougamau route, via Chapais. The route offers one trip per day, 6 days a week (Autobus Maheux, 2023).

A public transit system, Chapais Ligne Verte, also offers three trips a day between the towns of Chapais and Chibougamau (Ville de Chapais, n.d.).

Kepa Transport, a joint venture of the Cree communities of Wemindji and Chisasibi, offers general freight transportation services in Eeyou Istchee Baie-James, Abitibi-Témiscamingue and other major regions of Canada. Incorporated in November 1987, Kepa Transport subsequently added temperature-controlled transport and flatbed and B-train services to meet the needs of its various customers, including Hydro-Québec and mining companies (Kepa Transport, 2024).

Rail network

The Eeyou Istchee Baie-James region has 230 km of railroads, operated by Chemin de fer d'intérêt local (CFIL) du Nord du Québec, a subsidiary of Canadian National (CN), which provides service to Chibougamau and Matagami (CDC, 2024). The only rail line in the RSA is between Chapais and Chibougamau, which connects to the Saguenay-Lac-Saint-Jean rail network at its eastern end but does not extend beyond Chapais to the west. It offers no passenger service.

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Restoration of the rail link between Chapais and Grevet, now converted to a snowmobile trail, was part of the transportation infrastructure program under consideration as part of LGA's feasibility studies. The re-establishment of this rail link would provide a connection with the existing rail network in the southwestern part of the Eeyou Istchee Baie-James region and in Abitibi-Témiscamingue (LGA, 2024).

An intermodal zone project, proposed by the city of Chibougamau, is also under study. The Centre de logistique intermodale de Chibougamau (CLIC), located at the eastern entrance to the Nord-du-Québec region, would offer a transshipment site in its first phase, primarily to meet the needs of Nemaska Lithium (COMEV, 2024).

Air transport

The LSA/RSA has several airport infrastructures. The Chibougamau-Chapais airport is located about 20 km south of Chibougamau and is owned by the Quebec government (MTMD, 2024a). Air Creebec serves the Chibougamau-Chapais (YMT) airport with scheduled flights from Montreal-Trudeau International Airport (YUL). Between 2006 and 2011, aircraft movements grew by around 49%, from 4,399 to 6,573 recorded movements (Fédération québécoise des municipalités, n.d.). For the years 2022 to 2024, aircraft movements at Chibougamau-Chapais airport are presented in Table 20.11. In 2023, Chibougamau-Chapais airport saw a total of 10,080 aircraft movements, including 8,548 movements by aircraft operators transporting passengers, freight and/or mail, which is well above the values recorded in 2022 and 2024. Private aircraft movements, though significant, declined by around 35% between 2022 and 2023 (Statistics Canada, 2025).

The increase in travelling aircraft movements has had an impact on airport traffic, which has risen from 35,000 passengers in 2014 to 76,000 passengers in 2019 (SNC Lavalin, 2023). The Quebec government has invested \$16.6 million in 2021 to build a new terminal at Chibougamau-Chapais airport to increase its passenger capacity (Government of Quebec, 2021).

Table 20.11 Travelling Movements by Type of Operation Recorded Between 2022 and 2024 at Chibougamau-Chapais Airport (Statistics Canada, 2025)

	2022	2023	2024
Local and foreign air carrier movements	6887	8548	6524
Other commercial movements	376	212	126
Private movements	726	476	426
Official civil movements	269	667	244
Official military movements	6	177	4
Total	8264	10 080	7324

A hydroairport with public access (CSE6) at Lake Mistissini is used by Waasheshkun Airways Ltd. Two heliports are also located near Chibougamau: the Chibougamau heliport (CSB4) and Hydro-Québec's private heliport (CSE2) (MTMD, 2024).

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20.3 Project Interactions with the Valued Component

Table 20.12 identifies project activities in the construction, operation and closure phases that are likely to interact with the VC, infrastructure and services. The impacts thus identified are discussed in greater detail in section 20.4.

Table 20.12 Project Interaction with Services and Infrastructure

Physical Activities	Impacts		
	Change in availability of housing and temporary accommodation	Change in demand for services and infrastructure	Change in demand for transportation infrastructure
Construction			
Labour, equipment and materials transport to the site	-	-	
Vehicles and equipment operation and maintenance within the PDA.	-	-	-
Tree cutting, vegetation clearing, soil stripping and earthworks.	-	-	-
Handling and use of explosives, including blasting.	-	-	-
Construction of temporary and permanent buildings, including wastewater treatment system and drinking water collection and distribution system.	-	-	-
Construction of mining infrastructure such as stockpiles, pits and the raising of tailings management facility.	-	-	-
Construction of roads and preparation of construction surfaces including the crushing of material used for construction. Relocation of a section of the access road and power line.	-	-	-
Construction of water management systems including ditches, diversion channel, sedimentation ponds and the water treatment plant.	-	-	-
Dewatering of natural water bodies and pits, lowering water level in tailings management facility and management of contact water.	-	-	-
Diversion of Bibou Creek (CE2)	-	-	-
Management of waste materials, including hazardous waste.	-	√	√
Purchase of goods and services	-	-	√
Employment and expenditures	√	√	√
Operation			
Labour, equipment and materials transport to the site.	-	-	√

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Physical Activities	Impacts		
	Change in availability of housing and temporary accommodation	Change in demand for services and infrastructure	Change in demand for transportation infrastructure
Vehicles and equipment operation and maintenance within the PDA.	-	-	-
Handling and use of explosives, including blasting	-	-	-
Ore extraction from pits including drilling and hauling of waste rock.	-	-	-
Ore, waste rock and tailings storage.	-	-	-
Ore processing including conveyor, crushing, loading and hauling on site.	-	-	-
Transportation of concentrate to a smelter or a wharf.	-	-	√
Management and treatment of water on the mine site and to the environment, including drainage and contact water.	-	-	-
Progressive reclamation of disturbed areas.	-	-	-
Management of waste materials, including hazardous waste	-	√	√
Purchase of goods and services	-	-	√
Employment and expenditures	√	√	√
Decommissioning and Closure			
Labour, equipment and materials transport to the site.	-	-	√
Vehicles and equipment operation and maintenance within the PDA.	-	-	√
Decommissioning, dismantling and disposal of buildings and equipment.	-	√	-
Pits flooding, surface and groundwater management.	-	-	-
Reclamation of disturbed areas, including earthworks, placement of overburden and revegetation.	-	-	-
Management of waste materials, including hazardous waste.	-	√	√
Purchase of goods and services.	-	-	√
Employment and expenditures.	√	√	√

Notes:

√ = Possible interaction

- = No interaction

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Generally speaking, all the activities identified call for a workforce that is likely to settle in the region and increase the demand and need for services and infrastructure such as housing and temporary accommodation, school and education services, health services and municipal services. The management of residual materials from the mine could also place an additional burden on existing infrastructure. Additional pressure on the study area's road infrastructure is also expected due to the movement of workers, equipment and goods, as well as concentrate to the smelter sites.

All these impacts on infrastructure and services are expected to be reduced during the remediation and closure phase, since the number of employees on site will be lower than during the construction and operation phases.

Other activities have not been considered as interacting with the VC, since they do not involve any change in the current capacity of the LSA/RSA's infrastructure and services.

20.4 Assessment of Residual Impacts on Infrastructure and services

20.4.1 Change in Availability of Temporary Accommodation and Housing

20.4.1.1 Project Pathways

During the construction and operation phases, the project is expected to increase the Jamesian population in the LSA/RSA, which may increase pressure on housing and exacerbate the current housing shortage in the LSA/RSA.

During the construction phase, which will last around 3 years, the project will employ a maximum of 1,100 workers. During the operating phase, the project will require an average of 650 jobs during the first 18 years of operation, but this number will gradually decline in subsequent years, reaching around 270 on-site employees in the last year of operation (year 22). At the mine site, employees are expected to rotate on a schedule of 7 days on, 7 days off, while certain management positions will rotate on a schedule of 4 days on, 3 days off. A 14-day schedule may also be proposed. Employees will be accommodated at the on-site camp. It is likely that out-of-town workers will return home during their rest periods. Given the length of employee rotations, some may choose to stay in short-term rental accommodation, particularly during the construction phase, or settle permanently in the surrounding communities (Chibougamau, Chapais) with their families.

No impact on indigenous communities is expected. It is anticipated that Cree personnel from communities outside the LSA/RSA will return to their respective communities.

20.4.1.2 Mitigation and Enhancement Measures

A camp will be set up on the mine site to accommodate employees throughout the life of the project, i.e. during the construction, operation and closure phases, thereby reducing pressure on available housing in the study area. In addition to this measure, which is already included in the project design phase, the following measures are planned to reduce impacts on the availability of housing and temporary accommodation:

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- Troilus is committed to prioritizing hiring in local communities and in the region, depending on the availability of qualified candidates.
- Troilus communicates regularly with local training and educational institutions about existing, upcoming and potential course and training offerings, and how this aligns with Troilus' anticipated needs. Troilus continues to explore education and training opportunities and will develop hiring practices that encourage the employment and retention of qualified Indigenous people and local community members, including opportunities targeting youth.
- Troilus will explore opportunities to support training, education and scholarship programs that enhance employment opportunities, including participation in and contribution to local training networks, that target diverse groups such as Indigenous nations, local youth and various relevant sub-groups, such as the Indigenous Skills and Employment Training Program.
- Troilus will take traditional and cultural activities into account when proposing measures to enable the ongoing participation of indigenous employees. Further details will be set out in the Impact and Benefits Agreement (IBA).
- Employee schedules will be adapted as much as possible to community needs and work-life balance.
- Troilus will develop and implement a diversity and inclusion policy, which encompasses respectful workplace behaviors for diverse groups such as Indigenous nations, local youth, seniors, Two-spirited), lesbian, gay, bisexual, transgender, queer and intersex people (2SLGBTQI+), as well as people in sexual and gender diversity communities who use other terminology), visible minorities, people with disabilities and other members as identified under GBA+. Such a policy and subsequent training consists of awareness training for non-Indigenous employees to foster a respectful working relationship with Indigenous employees and contractors.
- Troilus will implement measures to encourage and increase the participation of women in the mining industry, including training opportunities and targeted employment opportunities for women as well as workplace policies to eliminate harassment and discrimination.
- Troilus will develop a partnership with local communities to develop solutions for various needs in terms of employment, training, economic benefits and accommodation.
- Troilus will communicate to municipal authorities and providers of temporary housing (hotels, camping, etc.) the projected manpower requirements for each phase of the project to better anticipate potential housing needs.
- Troilus will communicate and collaborate with the municipal authorities of the LSA/RSA to coordinate and promote the permanent settlement of newcomers based on community strategies and their planned residential development projects.
- A mechanism for managing concerns and complaints will be put in place and will be available on the Troilus website.

20.4.1.3 Project Residual Impacts

Troilus plans to house employees on the mine site. Based on the economic conditions presented in Section 20 (Economic Conditions) of the ESIA, it is anticipated that the local workforce will not exceed

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35% of the project workforce. The project will therefore generate an influx of workers from outside the region. Considering a workforce of 1,100 during construction, this represents approximately 385 residents and 715 out-of-town residents. In the operating phase, of the 650 workers, some 228 will come from the region, and 422 from outside.

Troilus wishes to prioritize the local workforce and reduce the need for outside labour and is therefore committed to promoting local training and recruitment. Troilus is already in contact with educational and training institutions such as the CFPBJ, the ASD and the Cégep de Saint-Félicien, and is working to promote training and employment of non-natives and natives in the mining sector. Troilus supports and is committed to supporting these institutions in their promotional activities through sponsorships and collaborative projects. To this end, as part of current and future education and training programs related to mining occupations, Troilus offers internship opportunities to students in these programs and provides mine site visits to current and future students with the aim of introducing them to mining occupations and raising their awareness of the need to enter the sector (see Chapter 4 of the ESIA). In addition, as indicated in section 3.13, several training and collaboration strategies will be put in place with the various regional players to fill the various job categories. To this end, Troilus will collaborate with teaching and educational institutions by providing them with its manpower and expertise requirements. In particular, Troilus will work with the CFPBJ, which, in collaboration with mining companies, offers training tailored to the various needs of the partner mine, thus improving the likelihood of students being hired by the latter. Troilus will also establish a partnership with the Mistissini community to assess specific training needs. The aim is to promote training and recruitment of the local population, both non-native and native.

According to data collected by the Association minière du Québec from member mining companies, workers tend not to settle in the Nord-du-Québec region, preferring instead to commute. In 2022, of the 4,075 workers in Nord-du-Québec, only 550 were residents of the region (14%). The workforce came from neighbouring regions such as Abitibi-Témiscamingue (32%), Saguenay-Lac-Saint-Jean (7%) and Capitale-Nationale (7%). In addition to the 4% of the workforce originating from outside Quebec, mainly from New Brunswick and Ontario, the remainder came from regions further afield, such as Laurentides, Montérégie, Montreal, Bas-Saint-Laurent, Gaspésie-Îles-de-la-Madeleine, Côte-Nord, Estrie, Laval, Outaouais, etc. (EcoTec Consultants, 2024) It is therefore anticipated that a small proportion of workers will settle in the communities of Chibougamau and Chapais. During shift changes and transit periods, commuting employees could then reside in these communities. Given the current shortage of rental housing in Chibougamau and Chapais, employee commuting would exacerbate the current situation. Some commuters could turn to hotel establishments for their temporary accommodation needs, particularly during the construction phase. While this would basically have a positive economic impact on the sector, it could also put additional pressure on the availability of temporary accommodation during the tourist season. During the operation phase, it is not impossible that some workers will be forced to stay in hotel establishments for longer periods while they look for accommodation. The housing shortage problem would then be temporarily transposed to the hotel sector.

To optimize the economic impact on the region, Troilus wants to encourage its employees to stay. Troilus plans to rotate work schedules over short periods (7 days) to make commuting less attractive. Incentives will be developed in partnership with local communities to improve the local settlement of the workforce. The arrival of employees and their families in the communities would, however, have an impact on the availability of housing. It is expected that employees with families will settle more in the region during the

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operation phase, whether in rental or permanent housing. During construction, it can be expected that the need will be more for rental housing.

At present, the rental and real estate market in the towns of Chibougamau and Chapais offers few housing opportunities, and new construction is low, resulting in a housing shortage. The arrival of newcomers could exacerbate this shortage and the lack of residential diversity, thereby increasing housing prices. This impact on housing would be more perceptible for people on low incomes (single parents, the elderly, etc.), for whom the current supply of affordable or adapted housing is limited. The influx of new arrivals could therefore exacerbate the shortage of adapted housing, to the detriment of family housing.

In its draft urban plan for 2024, the City of Chibougamau hopes to attract 250 new residents per year over the next five years. Several actions are planned by the city to attract and retain the new workforce and families in the towns and put in place incentives to encourage their permanent settlement in the city (City of Chibougamau). The town of Chapais also foresees new development opportunities in its 2021 urban plan, thanks in particular to the resumption of mining activities. In their respective urban plans (Ville de Chapais, 2021 and Ville de Chibougamau), the towns of Chapais and Chibougamau offer prospects for new residential development and provide for several measures in their respective urban plans to diversify the residential offer and meet the housing needs of all population categories.

To support the LSA/RSA towns in their development prospects and in implementing the strategies and actions of their respective urban plans, Troilus will develop a partnership with the local communities to develop solutions for the various needs in terms of employment, training, accommodation and economic spin-offs. Troilus will communicate with municipalities and suppliers of accommodation and temporary housing (hotels, camping, etc.) on the anticipated workforce requirements for each project phase, to better anticipate potential housing needs. This communication will also enable Troilus to help communities project themselves beyond mine closure, so that they take mine closure into account in their planning.

With the implementation of mitigation measures, the magnitude of the residual adverse impact on housing availability in the RSA/LSA is considered moderate, will occur in the LSA/RSA, will extend over the medium term and will occur on an ongoing basis. The residual impact is considered moderate.

The presence of the project in the region may create positive impacts if the demand for housing leads to a planned increase in the number of permanent and temporary dwellings in the LSA/RSA communities.

20.4.2 Change in Demand for Services and Infrastructure

20.4.2.1 Project Pathways

Changes in demand for services and infrastructure may occur as a result of population growth in the LSA/RSA during the project construction and operation periods. The settlement of new employees and their families in the communities of Chibougamau and Chapais may result in additional pressure on services and infrastructure such as health, emergency, education and municipal services. In addition, emergency and health services could also be called upon during mine operations to meet the needs of

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workers or following project-related accidents. Similarly, the establishment of a workers' camp could put additional pressure on municipal waste management services.

The arrival and settlement of new foreign employees in LSA/RSA towns and communities could lead to conflicts between the local population and new arrivals employed by the mine. Income disparities with the local population may also be one of the causes of these tensions and conflicts, just as the increase in disposable income may also exacerbate certain problems linked to alcohol and drug consumption and thus increase the demand on the police service.

The arrival of female employees with children will increase the need for childcare services and schools and may put additional pressure on these services in the LSA/RSA. Similarly, the settlement of these families could be associated with additional demand on municipal services such as drinking water supply and wastewater and residual materials management.

A positive impact on services and infrastructure is also foreseeable following the settlement of new workers in the area and their economic contribution to the towns and region, which would enable the tax burden of housing to be redistributed according to a greater number of residents. The need for skilled local labour in the mining sector will also have a positive impact on education services and vocational training centers.

As the increase in the Cree population is not anticipated, no impact on services and infrastructure in Indigenous communities is expected.

When the mine closes, the potential departure of employees and their families to new places to work and live will have no impact on municipal services and infrastructure. Should the current situation of understaffed childcare, health and emergency services continue over the years, the pressure on these services will diminish with the departure of employees. Additional demand for police and emergency services may be required during the closure and restoration phase to manage any project-related incidents at this stage.

20.4.2.2 Mitigation and Enhancement Measures

The following mitigation measures have been incorporated into the design phase and/or are proposed to avoid or mitigate project impacts on infrastructure and services. For the most part, these measures encourage the recruitment of a local and regional workforce, and the permanent settlement of employees and their families in the LSA/RSA. Many of these measures incorporate good practices already applied during the mine's previous operation, as well as lessons learned and feedback from that previous operation.

In addition to the mitigation measures proposed in section 20.4.1, the following measures will be implemented:

- Health and emergency services will be available on the mine site, based on what was already in place at the historic project. A fire protection service staffed by mine employees trained as volunteer firefighters will be set up. A 24-hour on-site nurse will also be on duty, assisted if needed by a doctor assigned to the project.

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- Cultural awareness training for new employees will be provided for each new hire, with the aim of maintaining the relationship and safety of neighboring communities.
- Coordination with the emergency infrastructure of the cities and communities of the LSA/RSA will be put in place during the development of Troilus Health and Safety Prevention Program in order to unify disaster response efforts.
- Troilus will implement a waste management plan and work with the City of Chibougamau on waste management.
- Support communities in managing and adapting services and infrastructure during mine closure.

20.4.2.3 Project Residual Impacts

Regarding health and emergency services, accidents that may occur on the construction site could require recourse to the region's emergency and medical services, thereby increasing pressure on these services, which, as described in section 20.2.2.3, have limited existing capacity. The implementation of Troilus' Occupational Health and Safety Prevention Program aims to establish best practices on site and to promote a health and safety culture among employees, which will enable actions to be taken to reduce the risk of accidents on site. The presence on the mine site of a nurse, and a doctor, if necessary, will reduce the need to call on the LSA/RSA's health services. Similarly, setting up a fire protection service trained by mine employees on site, and collaborating with the police and fire department, will enable us to manage certain situations internally, and thus only have to call on these professionals in cases of force majeure.

As for drinking water and wastewater services, employees will reside on the mine site during their shifts, supplied by underground wells in the camp area. Domestic wastewater will also be treated on site by an adapted treatment system. The use of on-site resources and infrastructure will reduce the load on municipal infrastructure. For residual materials management, recyclable materials will be sent by a specialized contractor to a specialized recycling center, and organic materials will be composted on the project site. The reuse of the existing landfill on site will initially avoid sending the material to the Chibougamau engineered landfill (LET). Once the LET has reached the end of its useful life, on-site sorting to separate recyclables and putrescibles will also reduce the amount of residual material sent to landfill. As mentioned in section 3.8 of the ESIA, the city of Chibougamau has expressed a desire to receive residual material from the mine, to reduce management costs at the current landfill due to the small amount of waste sent there.

The arrival and settlement of new employees and their families in the LSA/RSA towns during the construction and 22-year operation of the mine will potentially result in additional needs for health, education and daycare services. The James Bay region is facing a workforce availability issue, and health, emergency, daycare and education services are facing staff shortages and recruitment difficulties that have led to partial availability or even closure of certain services. For example, the Chibougamau hospital and CHSLD rely on foreign workers (La Sentinelle, 2022). In addition to difficulties in finding housing and creating a social circle, the lack of daycare space was cited as one of the most problematic issues encountered by former Chibougamau-Chapais residents in a survey conducted by ARBJ on the reasons for leaving James Bay (2021). For the commuters interviewed in the same survey, in addition to the desire to remain close to their places of origin, their families and social circles, the problem of access

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to specialists and health professionals is one of the reasons put forward by these commuters for not moving to James Bay. In collaboration with local communities, Troilus plans to offer social service incentives to provide employees and their families with conditions that encourage them to settle in the LSA/RSA. For example, during the GBA+ discussion workshops (refer to chapter 4 of the ESIA), it was suggested that Troilus could make a financial commitment to support the construction or expansion of childcare facilities. The mining company has also made a commitment to the towns of Chapais and Chibougamau to evaluate possible partnerships and collaborations aimed at promoting infrastructure projects such as recreational and cultural facilities (swimming pool, auditorium). Troilus will collaborate with each of the LSA/RSA cities to ensure that these incentives evolve with their urban development objectives. Already involved with local community organizations such as Carrefour Communautaire de Chibougamau, Troilus will continue its commitment to these organizations.

Considering that each of the towns of Chapais and Chibougamau is planning to promote population retention and the arrival of new residents, and to adapt access to public services, little impact on municipal infrastructure is expected because of the settlement of new mine employees and their families in these two towns. To mitigate any potentially adverse impact, Troilus will continue its communication and collaboration with municipal authorities. To this end, a project integration committee will be set up, bringing together representatives from Troilus and the towns of Chapais and Chibougamau, and tasked with developing solutions to the various needs raised by the project. Indigenous community representatives will also be able to sit on this committee, in addition to participating in the participation processes provided for under the IBA.

A potential increase in social problems in LSA/RSA communities could also be observed during mine construction and operation. Tensions could arise during the project, either between mine employees and those in other, less well-paid sectors, or between foreign employees and LSA/RSA residents. This risk could lead to an increase in recorded crime, requiring more services and intervention from police forces. During the previous operation, cultural awareness sessions and language courses were set up for mine employees, which helped to reduce the tensions between Indigenous and non-Indigenous employees that had arisen from the early phases of the historic project (Vincent Roquet and Associates., 2008). For the current project, Troilus will also follow this measure and implement cultural diversity training to promote this diversity and better integrate new arrivals to the region. Mine employees and managers will be trained and updated on the company's various policies.

When the mine is closed and rehabilitated, local labour will be favoured for jobs, so no new mobilization of external labour is expected. The potential departure of a certain proportion of employees and their families from the LSA/RSA will also reduce pressure on services and infrastructure. However, the risk of accidents will remain during the closure phase. Additional demand on health and emergency services is therefore expected but will be of lower intensity than during previous phases of the project. No specific mitigation measures are planned at this stage, and collaboration with the various communities and with health and emergency services representatives will be maintained to consider the adverse impacts of the project. Troilus will also continue its communication and collaboration with the communities to manage and adapt the infrastructure that will have been put in place to meet the needs of the project, to support the communities in relation to the potential demographic changes resulting from the mine closure.

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With the implementation of mitigation measures, the magnitude of the residual adverse impact on infrastructure and services in the RSA/LSA is considered low to moderate, will occur in the LSA/LSA, will extend over the medium term and will occur on an ongoing basis. The residual impact is considered moderate.

The positive impacts of increased demand on services and infrastructure in the demographic, geographic and economic context of the Nord-du-Québec region are noteworthy. For example, the need for local, trained manpower could benefit the CFPBJ by supporting the training programs already offered in the mining and construction sector. An increase in traffic to these local training centers is therefore expected. Troilus plans to collaborate with educational institutions to this end. The settlement of employees and their families in the study area, who will contribute to municipal tax payments and the region's economic development, could help offset the demographic exodus observed in the region, and thus maintain current services and infrastructure and bring in new ones. Troilus, through its integration and monitoring committee created with the towns of Chapais and Chibougamau, intends to support and monitor the project's spin-offs in these towns, as well as the effectiveness of the mitigation measures put in place, to determine whether they should be enhanced.

20.4.3 Change in Demand for Transportation Infrastructure

20.4.3.1 Project Pathways

Transporting construction materials and equipment, personnel, goods and services, and concentrate will increase traffic on the road network. Higher vehicle volumes may affect local road conditions, particularly on the Route du Nord, and increase the risk of accidents. Changes to the road network will be limited to the mine site. Access to the Troilus mine site will be by the existing access road from Route du Nord (KP 108). However, the access road will have to be rerouted at the mine site. The access road beyond the mine gate will be inaccessible to the public, except for Cree land users.

20.4.3.2 Mitigation and enhancement measures

The following mitigation measures are proposed to avoid or mitigate the project's impacts on infrastructure and services. Many of them are based on best practices already applied during previous mine operations:

- Employees will not be allowed to use their vehicles to get to the mine site; they will have to take the transportation service provided by Troilus from one of the home points located in the neighboring communities of Mistissini, Oujé-Bougoumou, Chibougamau and Chapais.
- Troilus will continue to work with the MTMD and the communities concerned to select the route that will have the least impact on the transportation of the concentrate.
- Troilus will ensure compliance with transportation standards (load and dimensions) for the various existing roads crossed by the project and will coordinate with the MTMD in the event of any excess.
- Troilus will cooperate with the MTMD as part of their road maintenance programs regarding the road alignments selected for ore transportation.

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- Standard road safety measures will be implemented, such as radio communications, escorting non-standard transports, and optimizing the concentrate transport schedule.
- A mechanism for managing concerns and complaints will be put in place and will be available on the Troilus website.

20.4.3.3 Project Residual Impacts

The access road to the mine site from Route du Nord will be reused for 39 km of the existing 44 km. Starting at km 39, the existing road will be rerouted along the eastern flank of the mountain bordering the tailings facility. The use of a section of the existing access road by trucks and construction vehicles, and the rerouting of a section of this road, will have impacts on land users who use this road. Regular use of this access road by the mine increases nuisance and the risk of traffic accidents between users. To ensure cohabitation between the mine and land users using this access road, standard road safety measures will be put in place. A communication procedure and a collision emergency plan will also be put in place to ensure the safety of access road users.

During the construction and operation phases, the mine will employ approximately 1,100 and 650 workers respectively, depending on the shift schedule (7/7 and 3/4 for management positions). Employees will be transported to the mine site by bus, from home bases in the communities of Mistissini, Oujé-Bougoumou, Chibougamau and Chapais. Approximately 44 bus trips per week are scheduled between the mine and the four attachment points during the construction phase. During the operation phase, 26 trips per week are anticipated to transport employees. It should be noted that 7998 trips/year (22 trips/day) in the construction phase and 4706 trips/year (13 trips/day) in the operating phase are also planned for the transportation of consumables and equipment. At this stage of the ESIA, the chosen solution for transporting copper concentrate is by road. The destination and route will be decided at a later stage of the project. A total of 84 trips per week, or 12 passages per day, are planned for transporting the concentrate. Thus, the transport of consumables, employees and concentrate will lead to additional use of the existing road infrastructure of the LSA/ZRA, including the Route du Nord. A total of 198 trips per week (28 per day) and 200 trips per week (29 per day) are expected during the construction and operation phases respectively (table 20.13).

The increase in these mine-generated trips of 28 and 29 per day is considered small in comparison with the annual and summer traffic volumes recorded by MTMD on the road sectors in the study area, and with the daily volumes for which the roads are designed. Although traffic volumes will be low, they will put additional pressure on existing road infrastructure, particularly pavement conditions, as heavy vehicles and buses will be using the site. This impact on road services and infrastructure will be similar during the construction and operation phases. Considering that Troilus estimates the number of workers required for restoration and environmental monitoring work at between 5 and 30, pressure on transportation infrastructure will be negligible compared with other phases.

However, the risk of road accidents remains higher throughout the life of the project, especially in adverse weather conditions. The implementation of standard road safety measures will reduce this risk.

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Table 20.13 Estimated Transport

Phase	Transport activity	Number			
		Annual round trips	Passages per year	Passages per week	Passages per day
Construction	Employees	1144	2288	44	6*
	Supplies	1399	2798	54	8
	Goods/equipment	2600	5200	100	14
	Total:	5143	10286	198	28
Operations	Employees	664	1328	26	4*
	Supplies	2153	4306	82	12
	Goods/equipment	200	400	8	1
	Concentrate	2190	4380	84	12
	Total:	5207	10414	200	29

* Employees will be transported once a week.

Impacts on road services and infrastructure will not be felt by LSA/RSA communities in the same way. Considering that Chibougamau and Mistissini are the communities closest to the mine site, that jobs will go primarily to Mistissini Cree, and that goods and equipment will mostly come from Chibougamau, it is assumed that transportation of employees, consumables and equipment will mostly originate from these two communities. When the mine is in operation, transportation of the mining concentrate will be the most important transportation activity. Depending on the destination and the route chosen, the RSA/LSA communities will be affected differently. The two variants currently under consideration for transporting copper concentrate are presented in section 3.10.6 of the ESIA. The preliminary route proposed for transporting the concentrate to the Horne smelter would have a greater impact on the LSA/RSA communities of Oujé-Bougoumou and Chapais, since it uses forest road R1029 and passes through the town of Chapais. On the other hand, the preliminary route proposed for transporting the concentrate to the port of Saguenay would avoid the LSA/RSA town centers by using the Chibougamau bypass. Beyond the limits of the LSA/RSA, the two preliminary routes should have the same impacts, as they both use roads with high AADT and truck traffic. On the other hand, the distance to be covered would be shorter for transporting the concentrate to the Port of Saguenay (551 km) than to the Horne smelter (691 km). At this stage of the study, Troilus envisages transporting two-thirds of the concentrate to the Port of Saguenay and the remainder to the Horne smelter. However, the proposed concentrate transport routes are subject to change because of ongoing discussions with the entities concerned.

Impacts on airport infrastructure are also possible. During the construction phase, a large proportion of employees are expected to come from outside the LSA/RSA. A proportion of these employees could arrive in the study area by air via the Chibougamau-Chapais airport. An increase in airport traffic is therefore anticipated. However, this possibility remains low because of the 7/7 shifts set up by Troilus to encourage employees to settle in the LSA/RSA. No impact is expected on the airport during the operating phase, since several measures will be put in place to encourage local employment and the permanent settlement of employees in the region.

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With the implementation of mitigation measures aimed at optimizing and reducing the number of vehicles on the roads, and making travel safer, the residual adverse impacts on transport infrastructure and services during the construction, operation and closure phases are considered moderate, limited to the LSA/RSA, extending over the medium term, continuous and reversible. The residual impact is considered moderate.

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20.4.4 Summary of Project Residual Impacts

Table 20.14 summarizes the residual impacts on infrastructure and services.

Table 20.14 Project Residual Impacts on Infrastructure and Services

Residual impacts	Residual Impacts Characterization							
	Project phase	Direction	Magnitude	Geographic extent	Timing	Duration	Frequency	Reversibility
Changes in the availability of temporary accommodation and housing	C/O	A	M	LSA/RSA	N/A	ST-MT	C	R
	D	A	L	LSA/RSA	N/A	ST	C	R
Change in demand for services and infrastructure	C/O	A	M	LSA/RSA	N/A	ST-MT	C	R
	D	A	L	LSA/RSA	N/A	ST	C	R
Change in demand for transport infrastructure	C/O/D	A	M	LSA/RSA	N/A	ST-MT	C	R

Project phase:
 C: Construction
 O: Operation
 D: Decommissioning and Closure

Direction:
 P: Positive
 A: Adverse

Magnitude:
 NMC: No Measurable Change
 L: Low
 M: Moderate
 H: High

Geographic extent:
 PDA: Project Development Area
 LSA: Local Study Area
 RSA: Regional Study Area

Timing:
 N/A: Not applicable

Duration:
 ST: Short term
 MT: Medium term
 LT: Long term

N/A: Not applicable

Frequency:
 S: Single event
 IR: Irregular event
 R: Regular event
 C: Continuous

Reversibility:
 R: Reversible
 I: Irreversible

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20.4.4.1 Summary of Adverse Residual Impacts

Several mitigation measures have been planned since the project design phase to reduce the impact of the project on infrastructure and services. These measures include local recruitment in the communities surrounding the Troilus site, including Mistissini, Oujé-Bougoumou, Chibougamau and Chapais, regional recruitment in Eeyou Istchee Baie-James, housing for workers in the mining camp, and travel arrangements from the home base. In addition to these measures, several others will be implemented to promote local workforce training, facilitate the permanent settlement of workers and their families and reduce commuting, as well as provide health and emergency services on the mine site. Thus, with the application of all these measures, the adverse impacts of the project on services and infrastructure, in terms of changes in available and temporary housing, changes in infrastructure and services, and changes in transportation infrastructure and services, are expected to be of low to moderate magnitude, within the LSA/RSA, of short to medium duration, with a continuous frequency and finally reversible. Impacts are considered moderate.

20.4.4.2 Summary of Positive Residual Impacts

The project could contribute to improving services and infrastructure. As already mentioned, educational and vocational training establishments should see an increase in attendance, and the settlement of employees and their families in the study area, who will contribute to municipal tax payments and the region's economic development, could help offset the demographic exodus observed in the region, and thus maintain existing services and infrastructure and bring in new ones. The project will thus indirectly contribute to the region's development and influence.

20.5 Prediction Confidence

The assessment of residual impacts on infrastructure and services is based on the implementation of planned mitigation measures, collaboration between Troilus and stakeholders, and the orientations and development projects of local players. The assessment is based in part on assumptions that involve uncertainties, particularly when considering the entire life cycle of the project. Examples include the availability and price of housing, the availability of manpower, and whether development projects are carried out in the region. Insofar as the assessment of residual impacts relies on a few external factors that are difficult to predict, the level of confidence in the predictions made is considered moderate.

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