

**UNDERSTANDING TRANSPORTATION NEEDS IN MINTO, CHIPMAN AND
SURROUNDING AREAS**

by

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A Report Submitted in Partial Fulfillment
of the Requirements for the Degree of

Master of Engineering

in the Graduate Academic Unit of Civil Engineering

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This report is accepted by the Dean of Graduate Studies

THE UNIVERSITY OF NEW BRUNSWICK

March, 2018

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ABSTRACT

This report is intended to support transportation decision making in the Villages of Chipman and Minto and their surrounding communities, which have become vulnerable to dependence on the automobile while dealing with a shrinking and aging population and centralized urban services. Community profiles were developed to fully understand the demographic, socioeconomic and commuter characteristics. An inventory of transportation assets and programs was compiled through research and a telephone survey of community groups, churches and businesses. The survey demonstrated the lack of transportation options available to residents.

Three alternative transportation options were examined in greater detail: A commuter bus service; volunteer driver program; and a park-and-ride service. A 37 passenger bus at capacity could cover its operating costs at \$10 per ride; coarse estimates suggest a volunteer driver program may be able to solicit 38 members and 8 drivers; and existing parking lots should provide sufficient space for realistic park-and-ride usage.

ACKNOWLEDGEMENTS

I would first like to thank my supervisor Dr. Trevor Hanson for all his hard work and guiding hand in helping me with the development and preparation of this report. His earnest encouragement and purposeful critiques sharpened my focus and were instrumental in the completion of this report.

Second, I would like to thank Susanne White and Greater Fredericton Social Innovation for the opportunity to work on this project. This experience has been invaluable and I am grateful for the opportunity.

Thank you to Dr. Yuri Yevdokimov for helping guide me safely through the economic analysis and thank you to Dr. James Christie and Dr. Xiomara Sanchez-Castillo for taking the time to provide valuable commentary on this report.

I would like to thank all of the students in the UNB Transportation Group for their friendship and help over the last two years. I would like to acknowledge Matthieu and David for sharing their research that helped in the preparation of this report.

Thank you to my family for always being there with help and support. Finally, I want to thank Kelley for all of her encouragement and patience over the past two years. I would not be here without her.

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LIST OF ABBREVIATIONS AND ACRONYMS

AADT – Annual Average Daily Traffic

AASHTO – American Association of State Highway and Transportation Officials

APTA – American Public Transportation Association

CDAR – Charlotte County Dial-a-Ride

CIN – Community Inclusion Network

CITE – Canadian Institute of Transportation Engineers

DOT – Department of Transportation

ESIC – Economic and Social Inclusion Corporation

FHWA – Federal Highway Administration

FTA – Federal Transit Administration

GFSI – Greater Fredericton Social Innovation

GNB – Government of New Brunswick

ITE – Institute of Transportation Engineers

LIM-AT – Low Income-After Tax

LSD – Local Service District

NBDTI – New Brunswick Department of Transportation and Infrastructure

NBEUB – New Brunswick Energy and Utilities Board

NBHC – New Brunswick Health Council

NCHRP – National Cooperative Highway Research Program

NHS – National Household Survey

NTSC – National Transportation Systems Center

RSC – Regional Service Commission

TCRP – Transportation Cooperative Research Program

TRB – Transportation Research Board

TDC – Transit Development Corporation

TTI – Texas Transportation Institute

UNB – University of New Brunswick

VDP – Volunteer Driver Program

1 INTRODUCTION

Many communities in rural New Brunswick are experiencing a growing population of older adults, shrinking overall populations, limited local employment opportunities and the relocation of local commercial and government services to urban areas. This puts additional onus on residents to travel longer distances to access essentials such as medical appointments, grocery shopping, employment and banking, increasing their reliance on the personal automobile for trip-making. The challenge is that not all residents are in a position to change their travel behaviour to accommodate an increase in automobile reliance. Rural populations are particularly dependent on driving as, in many parts of rural NB, there are no alternatives to driving one's own car; yet there are circumstances where individuals can no longer meet their needs by driving an automobile.

The health effects of aging, for example, can make driving difficult or impossible over time, while owning and operating a vehicle, with all of the associated ancillary costs, can become prohibitively expensive for some. Without adequate community support and available options, the dependence on personal vehicles as the sole source of transportation has the potential to leave vulnerable individuals isolated from essential day-to-day activities.

The Villages of Chipman, Minto and surrounding areas are examples of communities encountering similar demographic and economic trends experienced in other areas of New Brunswick, though some issues are more pronounced than the province as a whole. Consider the following:

- A total of 28% and 33% of the population of Chipman and Minto, respectively, are over the age of 65, higher than the overall percentage of 20% for New Brunswick;

- There have been some high profile losses of employment and commercial services, including the recent (2017) loss of Minto's only grocery store in a fire and the closure of the only bank branch in Chipman (2016);
- The loss of a commuter bus service that connected Chipman and Minto to Fredericton (2013) and the closing of a local taxi company.

These communities have faced and are facing the types of demographic and economic challenges that will likely continue an increasing reliance on the use of the private automobile for trip-making. Depending on family and friends to close all existing gaps in transportation accessibility is unlikely to be a reliable long term solution.

While New Brunswick does not currently employ regional transportation planning that would ensure rural transportation needs are understood, there is an opportunity for Minto, Chipman and surrounding communities to position themselves to meet the changing needs for transportation in the region. Finding solutions to these challenges at the local level, while engaging residents, may provide a firmer foundation from which viable transportation alternatives can be developed.

This report, and its findings, presents an opportunity to support a high-level understanding of transportation needs, current transportation assets, including an evaluation of potential transportation solutions. It is through this type of examination and analysis that viable plans can be developed for the region while honing in on specific solutions that may work in the context of the region. It is envisioned that this report would represent a foundational effort to support decision-making by communities within the study area.

1.1 Project Motivation

The project is intended to support transportation decision-making in the Villages of Minto and Chipman with the potential to feed into regional transportation planning involving those communities and the surrounding Local Service Districts (LSDs). LSDs are unincorporated areas in the province (GNB, 2017) and were generally created from the old Parish boundaries that existed prior to the abolition of incorporated county municipalities by the Municipalities Act of 1966.

The Economic and Social Inclusion Corporation (ESIC) in New Brunswick is tasked with alleviating poverty in New Brunswick. Its mandate specifically is “to develop, oversee, coordinate and implement strategic initiatives and plans to reduce poverty and assist thousands of New Brunswickers to become more self-sufficient.” Through the ESIC, Community Inclusion Networks (CINs) were established across New Brunswick and are tasked with carrying out the ESIC mandate at a local level. Chipman and Minto and the surrounding LSDs are located within CIN Region 3, which is the Greater Fredericton Community Inclusion Network, hosted by Greater Fredericton Social Innovation (GFSI).

Overcoming poverty and assisting in establishing self-sufficiency is a broad objective which covers many aspects of life. Without adequate and accessible options for transportation, efforts to overcome poverty will not reach their full potential. It is through this framework that GFSI has initiated this project with the anticipation that it will help in the work towards the objective of overcoming poverty.

1.2 Project Goals and Objectives

The primary goal of this project is the creation of this report to support transportation decision making in the Villages of Minto and Chipman, with the potential to feed into regional transportation planning involving those communities and the surrounding LSDs.

In order to achieve this, the specific objectives were:

Objective #1: Assemble background material and create a stakeholder inventory. This was to be accomplished by preparing a demographic profile for Chipman, Minto and surrounding LSDs, preparing a commuter flow profile based on Statistics Canada data, cataloguing the existing formal and informal alternative transportation options and assets in the study area and evaluating the potential for a community transportation survey including its necessity and scope.

Objective #2: Conduct a high-level evaluation of potential alternative transportation options, including high-level costs, possible ridership scenarios, identification of public, private and not-for-profit sector partnerships. This evaluation was to be completed by analysing three possible options which include a volunteer driver program, a commuter bus service and a park-and-ride program.

Objective #3: Conduct community engagement exercises. Specifically, this was to involve engaging local elected officials on local and regional transportation service priorities and obtaining perspectives on the three options identified in Objective #2. Finally, after engaging local interest, soliciting feedback from elected officials and citizens on other potential transportation alternatives.

Objective #4: Refine the list of options and estimates from Objective #2 based upon the feedback received from Objective #3.

Objective #5: Prepare the final report through synthesizing the outcomes of Objectives #1-4.

This was to include considerations for the next steps to be taken and presentation of the results to Village councils, LSD councils (if they exist) and Regional Service Commission #11 if necessary.

In some cases, the scope of some of the objectives needed to be amended in response to unexpected events and was done in consultation with Susanne White of CIN #3.

1.3 Report Organization

The report is organized as follows:

- Introduction of the subject matter through briefly describing the current situation within the study area, the motivation for the project and the overall goals and objectives.
- Background information of the region, presented more thoroughly than in the Introduction. This is in order to demonstrate the current demographics, economic conditions, existing transportation and planning in the study area and previous research efforts, identified challenges and need for future research
- Methodology of the study demonstrating the processes used to gather information and the method of answering the questions posed through the initiation of the project. This will include the guiding documentation, data sources and data collection methods.
- Analysis of all the collected information is presented according to the subject matter. It includes the commuter profile, survey results, potential of commuter bus, park and ride and volunteer driver program

- Conclusions and next steps end the report with a view towards what the local and regional parties can do to incorporate what has been presented into actionable plans.

2 BACKGROUND

An investigation into the current conditions within the region begins with a broad examination of the demographics of the region and finishes by narrowing towards specific transportation related considerations.

An overview of the study area and regional economy is presented through the most recent available Statistics Canada data, followed by the current state of transportation within the study area. Current planning practices are explored with a focus on their relationship with transportation. Lastly, the previous research concerning transportation in the region is discussed in concert with the identified challenges and need for further research.

2.1 The Study Area

The study area, shown in Figure 1, includes the Villages of Chipman and Minto and the Parishes of Canning, Chipman, Waterborough, Northfield and Sheffield which are classified as LSDs. The area encompasses 1771 square km and a total population of 7522 in the northern areas of Sunbury and Queens County, NB. There are two incorporated communities, the Villages of Minto (pop. 2305) and Chipman (pop. 1104). There are numerous smaller communities, such as Douglas Harbour, Ripples and Coal Creek which are unincorporated and fall within LSDs.

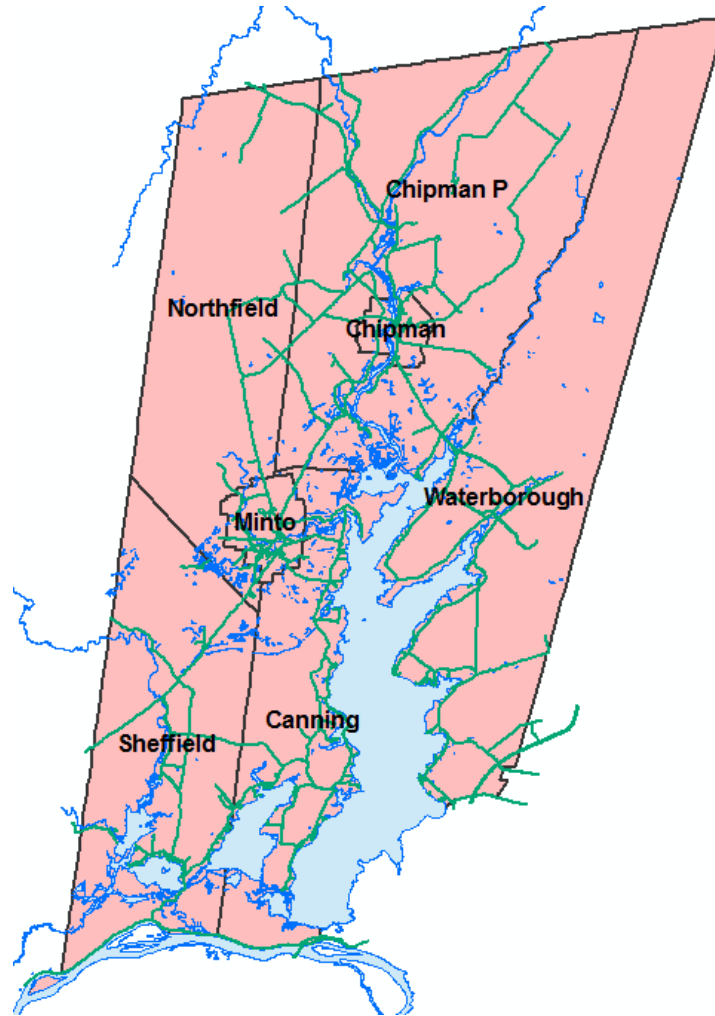


Figure 1: Study Area (showing roads and waterways) (GeoNB)

2.1.1 Regional Economy

Historically, the region has been resource dependent, with timber and coal being the predominant industries. Coal had been mined near Minto since 1639 when it was sent to Boston (NB Museum, 2013). The construction of railways to the village in 1904 allowed for larger scale mining operations to take place (NB Museum, 2013). The Grand Lake Generating Station came online in 1931, near Minto, and was fed by the nearby mining operations. In 2010 NB Power decommissioned the generating station. NB Coal Ltd., the sole provider of coal for the power plant closed in conjunction with the plant at the end of 2009 (GNB, 2009)

Timber continues to be an important driver of the regional economy in Chipman as JD Irving Ltd operates a sawmill. Apart from timber, the region takes advantage of the recreational opportunities presented by Grand Lake, the largest in New Brunswick. There are numerous campgrounds, trails, beaches and parks in the region which cater to many outdoor activities such as fishing, canoeing and water skiing. The numerous recreational opportunities bring cottage goers to the region helping to grow the area as a popular rural tourist destination within reach of the cities Fredericton and Moncton. (Villages of Chipman and Minto, 2017)

Within the region there is also a large industrial park, located in Minto, the Queens North Health Centre in Minto and the Chipman Health Centre, several public schools and two main commercial areas in Minto and Chipman.

2.1.2 Transportation in the Study Area

The study area is bisected by Grand Lake with New Brunswick Arterial Highway 10 serving as the main thoroughfare, linked to the Trans-Canada Highway to the south and a number of collector highways (123 to Doaktown, 116 to Richibucto, 105 between Fredericton and Route 10 near Youngs Cove) that connect to the rest of the province. There are also a number of provincial local highways which branch off Route 10 and connect smaller communities and a number of recreational areas along Grand Lake and other lakes. A CN mainline railway travels through the study area at Chipman, with a branch line connecting to a local industry. The rail line that formerly connected to Fredericton has been turned into part of the NB Trail system. There is currently no intercity bus service and only a single taxi service in the study area, located in Minto.

2.2 Planning in the Study Area

Municipalities are typically responsible for their own land use and transportation planning in New Brunswick, as prescribed under the Community Planning Act, while unincorporated areas will fall under the jurisdiction of a Regional Service Commission. The entirety of the study area falls under Regional Service Commission (RSC) 11. The commission is mandated to provide regional planning, local planning in LSDs, solid waste management, policing collaboration, emergency measures planning and sport, recreational and cultural infrastructure planning and cost-sharing (RSC11, 2017).

The Villages of Minto and Chipman have their own respective rural plans. Minto formerly had a municipal plan, adopted in 1993 but it was retitled as a rural plan in 2010. Rural plans also exist for the Local Service Districts of Canning and Waterborough of which the latter is included in the Cambridge-Waterborough Rural Plan. The other communities in the study area do not have formal rural plans as determined from a review of the RSC 11 website.

All of the most recent rural plans were reviewed for this work in terms of their transportation provisions. Each plan follows the same structure and deals with zoning, land use, water, environmental considerations and other typical community concerns. There is little consideration given to transportation service planning within these plans; rather the focus is on transportation land use with respect to parking requirements and transit terminals. Each plan defines the minimum number of parking spaces for different land uses, while the Minto and Chipman rural plans allow for “a bus or other public transportation terminal” (Village of Minto, 2013) to be constructed in particular zones but the plans do not delve into further details.

According to the Institute of Transportation Engineers, transportation planning is considered to be “the functional area within transportation engineering that deals with the relationship of

land use to travel patterns and travel demands; and the planning, evaluation, and programming of transportation facilities, including roadways, transit, terminals, parking, pedestrian facilities, bikeways, and goods movement” (ITE, 2017). This is in contrast to planning in general which is defined by the Canadian Institute of Planners as “the scientific, aesthetic, and orderly disposition of land, resources, facilities and services with a view to securing the physical, economic and social efficiency, health and well-being of urban and rural communities” (CIP, 2017).

Transportation planning is a more focused sub-discipline of planning and is often less essential in rural settings due to smaller population bases and budget constraints. The rural plans in the study area are primarily general and land-use planning documents.

This is in contrast to municipal plans in larger cities which often encompass a wide range of planning disciplines. The Fredericton municipal plan encompasses the type of land-use planning undertaken in the rural plans and expands upon it. It examines how growth will affect the city and breaks down different regions of the city to allow for local conditions within the city to be considered. The transportation section of the municipal plan examines the road network in detail, public transportation, cycling and pedestrian considerations and water transportation (City of Fredericton, 2007).

In Moncton, the Destination 2040 plan is a regional transportation master plan for Moncton, Riverview and Dieppe. This plan only considers subjects related to transportation such as public transit, parking, complete street design and truck routes (City of Moncton, 2015). This level of detail is not possible at the rural planning level but some aspects can be applied to help manage issues with transportation at this level.

2.3 Previous Transportation Research Efforts in the Region, Identified

Challenges and Need for Future Research

A previous study completed for the Greater Fredericton Community Inclusion Network, (Hanson, 2014), titled “Towards the Development of Alternative Transportation for Sunbury and Queens Counties, NB” provided information about the demographics, socioeconomic data and commuting numbers within the region. Through community stakeholder engagement and consultation, five challenges were identified. These challenges were:

- Who has the responsibility to address transportation issues and coordinate solutions outside of municipalities and between communities?
- What is the explanation for higher rates of transportation problems to healthcare in northern Sunbury and Queens Counties?
- How can we turn an aging population into an opportunity?
- How to start the conversation with the Department of Education about making pupil transport friendlier to a family’s transportation needs?
- Building on existing transportation services and programs.

This study pertained to the entirety of Queens and Sunbury counties and was primarily an exercise in information gathering and public consultation. Information gathered included demographics, socioeconomic data and commuting numbers within the region along with compiling an inventory of transportation assets. The consultations were held through various conversations with transportation providers in the region as well as at three public stakeholder meetings throughout the region.

The report found that there were very few alternative transportation options available to residents. Some possibilities for alternative transportation were identified at stakeholder

meetings and they included making better use of school buses to transport children to afterschool programs and the possibility of leveraging nursing home transportation assets for the wider community.

The New Brunswick Health Council (NBHC) community profiles give “a comprehensive view about the people who live, learn, work, and take part in community life in this area” (NBHC, 2017). The most recent release is from 2017. The study area is within the Minto, Chipman, Cambridge-Narrows Area community as designated by the NBHC. The community profile shows that 10% of the community had transportation problems in getting health care when needed in 2014. This is higher than the New Brunswick provincial percentage of 7%. This information was obtained from the NBHC’s New Brunswickers’ Experiences with Primary Care 2014 Survey (NBHC, 2017).

When the Chipman-Minto-Fredericton commuter bus service, formerly operated by Trius, ceased operations in 2013, it left a void in transportation options for residents. The commuter bus operated twice-daily between Chipman and Fredericton. There was a single morning trip with a return trip in the evening. Stops in Minto and Noonan were made between each end destination (NBEUB, 2009). For the past four years the only option has been to drive a personal vehicle or be driven by someone who has one.

ESIC’s most recent Overcoming Poverty Together Plan demonstrated the need for overcoming transportation challenges as a part of overcoming poverty. Priority actions included promoting and supporting “community-based alternative transportation systems” as well as “developing a comprehensive rural and urban transportation strategy for the province” (ESIC, 2014). This strategy was released in December 2017.

Other reports have been produced in similar regions of the province that are predominantly rural and have transportation challenges. One such report from 2012 titled “Towards the Development of Alternative Transportation for Carleton and Victoria Counties”, by Hanson and Cameron of the UNB Transportation Group, found that community stakeholders concluded that alternative transportation was needed for senior citizens, individuals living in low income, persons with disabilities, families with young children and individuals seeking employment opportunities. These can be considered typical transportation obstacles that are seen across rural areas in New Brunswick, including within the study area.

The previous study examined the entirety of Queens and Sunbury counties, which had a combined 2011 population of 38,229, while the study area within the counties had a 2016 population of 7,522. The inclusion of the relatively larger population centres of Oromocto, Lincoln and Burton in Sunbury County shifted the focus of the study more towards those places with limited focus on the Minto-Chipman-Grand Lake area specifically. A more targeted examination of the Minto-Chipman-Grand Lake study area would more explicitly document the current transportation situation and community needs.

The information from the related studies suggests that the only option for transportation for communities within the study area appears to be the personal vehicle or walking. The required commuting distances can preclude walking, especially for those with mobility challenges. The cost of vehicle ownership can be an encumbrance but personal vehicles often remain the only choice when people need to attend medical appointments, run errands and take part in recreational and community events. There is limited information about the transportation needs and existing travel patterns within the study area and without this information it is difficult to propose potential solutions.

Previous reports within the study area have largely focused on gathering opinions on the transportation shortcomings. Specific transportation options have not been explored in any detail in past reports. Being able to place an order of magnitude on potential costs would help to steer further exploration into the viability of any transportation solution. For example, the success of volunteer driver programs in other similar rural locations across the New Brunswick means the idea may have the potential to succeed within the study area as well. Even though the commuter bus service ceased operations in 2013, there was a clear demand for its service at the time. If the commuter bus was reintroduced, or a park-and-ride or a carpooling facility/system created, these options may be able to fill in the existing gap in transportation options for residents. The dilemma is that the suitability or feasibility of these options is currently unknown. The effort and expense of establishing any of these options is such that they cannot be launched prior to an initial investigation that gathers enough relevant information so that an informed decision can be made.

3 METHODOLOGY

The study relied on several sources of available information and involved some data collection exercises. Information was gathered from:

- The World Wide Web electronic resources
- Statistics Canada 2016 Census
- Statistics Canada 2011 Census
- National Household Survey (2011)
- GIS basemaps were obtained from GeoNB.ca
- Correspondence with Village councillors in Chipman and Minto
- Consultation with Queens North Community Health Centre community developer
- Telephone survey of area businesses
- Telephone survey of area community groups and churches

The survey components of the project were reviewed and approved by the UNB Research Ethics Board, REB 2017-089.

Originally there was to be community engagement of local citizens in Minto and Chipman in order to obtain their perspectives on transportation in the region and the three identified potential solutions. This was to be completed with help and direction from the Queens North Community Health Centre; however, due to staff turnover and the fire at the Minto Foodland the public engagement sessions did not take place.

3.1 Guiding Documentation

Several sources of guiding documentation were consulted during the study. Technical handbooks provided a framework to approaching rural transportation planning. Previously

completed technical reports related to transportation planning in the region provided a basis for which this study could build upon further. Other technical reports from the Transit Cooperative Research Program (TCRP) and Transportation Research Board (TRB) in the United States as well as research and reports carried out at UNB provided well researched analysis of issues relating to transportation in the rural context.

3.1.1 Technical Handbooks

The Institute of Transportation Engineers (ITE) is an international membership association of transportation professionals who work to improve mobility and safety for all transportation system users and help build smart and livable communities. The organization was founded in 1930 and consists of transportation engineers, planners, consultants, educators, technologists and researchers (ITE, 2017). The Canadian chapter is the Canadian Institute of Transportation Engineers (CITE).

ITE produces the Transportation Planning Handbook which “is a comprehensive, practice-oriented reference resource that presents the fundamental concepts of transportation planning alongside proven techniques” (ITE, 2017). The Handbook is currently in its 4th edition and that is the version consulted for this study.

The Handbook was consulted to provide guidance on methods of handling rural transportation planning. Sections that deal with the options presented in Objective #2 (volunteer driver program, commuter bus service, park-and-ride program) were examined for applicable models or any other information or strategies that may be useful within the study area.

The ITE planning handbook approach to rural transportation planning is similar to its approach to urban transportation planning; the only difference is the scale of the problems and the

potential solutions. It does list five parts of the planning process that are important to consider when planning rural transportation:

- Understand the problems
- Developing visions, goals, objectives and performance measures
- Identifying needs (through data collection) and analyzing alternatives
- Evaluating and prioritizing alternatives
- Involving the public

These steps are essential to completing any transportation plan in a thorough manner. Using the experiences from other jurisdictions can help to find transportation solutions as they may be applicable or have similar circumstances. While the Handbook focuses on rural transportation planning in the United States, the lessons can be applicable within Canada as many rural communities in both countries are being challenged with older, declining populations and there are similar transportation planning environments in rural areas.

3.1.2 Technical Reports

Research carried out within the field of transportation planning is crucial in order to further understanding and refine best practices. Often presented in the form of technical reports, conference presentations or theses, the research carried out helps transportation planners to better understand what is needed and the best understanding of how to achieve the desired results. In the United States, the TCRP was established in order to fund research that could help “to solve operating problems, to adapt appropriate new technologies from other industries, and to introduce innovations into the transit industry”. In 1992 the TCRP was “established under Federal Transit Administration (FTA) sponsorship” and “a memorandum agreement outlining TCRP operating procedures was executed the three cooperating organizations: FTA; the National

Academies of Sciences, Engineering, and Medicine acting through the Transportation Research Board (TRB); and the Transit Development Corporation, Inc. (TDC), a non-profit educational and research organization established by the American Public Transportation Association (APTA)” (TRB, 2017).

The TRB, as a part of the National Academies of Sciences, Engineering, and Medicine, “provides innovative, research-based solutions to improve transportation”. The TRB “provides independent, objective, and interdisciplinary solutions” and “manages transportation research by producing publications and online resources.”

These two organizations (TCRP, TRB) in the United States provide a wealth of information that, as a part of government research, is publicly available and a valuable resource to all persons within the transportation field. Being a national organization in the United States, it is able to fund research initiatives with scopes that would be difficult to replicate within smaller jurisdictions.

Reports created under the TCRP that were useful to this study are Synthesis 53 – Operational Experiences with Flexible Transit; Synthesis 94 – Innovative Rural Transit Services; Report 136 – Guidebook for Rural Demand-Response Transportation: Measuring, Assessing, and Improving Performance; Report 161 – Methods for Forecasting Demand and Quantifying Need for Rural Passenger Transportation.

The National Cooperative Highway Research Program (NCHRP), also under the umbrella of the TRB and in association with the American Association of State Highway and Transportation Officials (AASHTO) and the Federal Highway Administration (FHWA), conducts research in the transportation sector. NCHRP Synthesis of Highway Practice 213 – Effective Use of Park-and-

Ride Facilities and the AASHTO Guide for Park-and-Ride Facilities are two reports that are relevant to this study.

Research completed at the University of New Brunswick (UNB) produces information that is more relevant to conditions within New Brunswick. Literature produced by Dr. Hanson on volunteer driver programs within the province has helped smaller communities find feasible transportation solutions. Individual studies completed by graduate students on topics such as park-and-ride are also valuable. Their findings, summaries and analyses, often with a local or provincial focus, can also help in transportation planning efforts.

3.2 Data Sources

Transportation planning for services in New Brunswick is typically undertaken at the municipal level and can be supported by detailed household travel surveys and traffic counts to determine the travel patterns of residents and goods in order to prioritize infrastructure investments to mitigate congestion. Smaller municipalities and rural areas typically do not have the resources to conduct a household travel survey; however it may not always be necessary because the low traffic volumes found in these locations means that travellers will not experience difficulty driving from one location to another. The provincial Department of Transportation and Infrastructure also undertakes transportation planning primarily focused on infrastructure needs (such as vehicle counts on roads and highways), services such as ferries, and safety and environmental concerns (GNB, 2017).

3.2.1 Sources for Understanding Community Demographics

Statistics Canada is the central statistical office within Canada. It is “legislated to serve this function for the whole of Canada and each of the provinces and territories”. Its main purpose is to provide “statistics that help Canadians understand their country – its population, resources,

economy, society and culture”. It is a federal agency that every five years conducts a Census along with “about 350 active surveys on virtually all aspects of Canadian life”. Statistics Canada is a member of the United Nations Statistical Commission and “endorses the Fundamental principles of official statistics”.

For this study, data from the most recent Census, taken in 2016, was used, along with information obtained in the 2011 Census and the National Household Survey (NHS) of 2011. The NHS taken in 2011 suffers from some data quality issues as it was a voluntary survey as opposed to all previous censuses which were mandatory. The voluntary nature of the NHS produced higher global non-response rates than had been seen in the 2006 Census and because of this some community-level data was not released (Statistics Canada, 2016).

3.2.2 Sources for Understanding Community Transportation Needs

The challenges with the NHS data were most noticeable when examining commuter flow data. Commuter flow data helps to understand travel patterns for workers. It reveals the travel habits for workers compared to the location of their usual residence. With the aforementioned voluntary nature of the 2011 NHS, 1100 communities did not have data published due to low response rates that were unacceptable by the standards of Statistics Canada (Statistics Canada, 2016). By comparison, fewer than 160 communities had data withheld due to quality issues from the 2006 Census.

There are some sources that may help in developing useful estimates about the study area. Publications by the New Brunswick Health Council and the Statistics Canada Canadian Community Health Survey describe the need for trips relating to general health. This is particularly relevant due to the demographics of the study area.

Reports published by the ESIC can show, qualitatively, the needs of communities within the study areas in terms of social engagement, education, economics and social inclusion. These reports provide a base from which further analysis into these sub-categories can help to inform methods to solve transportation obstacles.

Table 1: Data Sources from Statistics Canada

Community	Demographic Data Source	Socioeconomic Data Source	Commuting Flow Data	Non-response to 2011 NHS
Minto	2016 Census	2016 Census	2011 NHS	48.6%
Chipman	2016 Census	2016 Census	2011 NHS	48.1%
Canning	2016 Census	2016 Census	2011 NHS	39.4%
Chipman Parish	2016 Census	2016 Census	2011 NHS	40.6%
Waterborough	2016 Census	2016 Census	Not available	-
Sheffield	2016 Census	2016 Census	Not available	-
Northfield	2016 Census	2016 Census	Not available	-
* Global non-response for New Brunswick was 28.6%				

3.2.3 Other Sources

The Trius commuter bus that formerly operated scheduled service from Chipman and Minto to Fredericton was discontinued in 2013. The company was licensed to operate on this route by the New Brunswick Energy and Utilities Board (NBEUB). As a part of the proceedings, Trius made the case to the board that the service was no longer financially viable for the company. They presented three years' worth of condensed financial statements along with ridership numbers for the previous twelve months of operations. This data is publicly available because of the review process and provided numbers from which any attempt at a service revival could use as estimates of future ridership.

3.3 Data Collection Procedures

In order to understand the current state of transportation services within the study areas, relevant data are required. Having an inventory of existing services in the region establishes a

baseline from which future decisions can be made. These may be provided by non-profit or the private sectors. Through an inventory, potential partners in transportation solutions can be identified. An inventory can also pinpoint areas where transportation needs are not currently being met.

An inventory of services in the region can be assembled through means such as searching the World Wide Web, contacting local government representatives or telephone surveys of residents, non-profit and community groups, businesses, health care providers and any other potential transportation provider within the region.

In conjunction with an inventory, specific information about individual trips can help in the decision making process. Knowing trip information about the quantity, types, times taken and number of individuals travelling will help to develop a broader understanding of trip demand in the region. This type of data is normally collected through travel surveys as the census does not collect information this detailed. Statistics Canada has a travel survey; however, it is administered to measure domestic travel within Canada and does not collect this type of data. In the United States the Federal Highway Administration conducts the National Household Travel Survey. The survey “provides information to assist transportation planners and policy makers who need comprehensive data on travel and transportation patterns in the United States” (NHTS, 2017). Surveys of this type, but not necessarily of this scale, are extremely valuable to the transportation planning process.

4 COMMUNITY PROFILE

Building a community profile of the study area requires different types of information collected by Statistics Canada. The most important information for transportation planning is demographic, socioeconomic and commuter data. Since the study area is extensive, the information is presented according to each community within the study area.

4.1 Demographic Profile

The region has seen a 6% decrease in population from 2011 to 2016, as shown in Table 2 and Figure 2, with the largest declines in Minto, Chipman Parish and Sheffield. The region is predominantly rural as the LSDs (designated as parishes in the Statistics Canada 2016 census) have population densities of less than 6 persons per square kilometer as demonstrated in Figure 3. Slightly more than 45% of the total population live in the Villages of Minto and Chipman. The demographic breakdown of the study area is presented in the Table 2.

Table 2: Community Demographics (2016 Census)

Community	Population	Population Density (Individuals/km ²)	% Change (2011-2016)	Median Age	Designation
Minto	2305	72.8	-8.0	52.7	Village
Chipman	1104	58.1	-4.3	55.1	Village
Canning	924	5.3	-2.9	55.7	Parish
Chipman	913	1.9	-5.1	54.6	Parish
Waterborough	847	1.9	-0.5	56.4	Parish
Sheffield	809	3.0	-5.2	51.7	Parish
Northfield	620	2.0	-3.6	50.8	Parish
New Brunswick	747,101	10.5	-0.5	45.7	Province

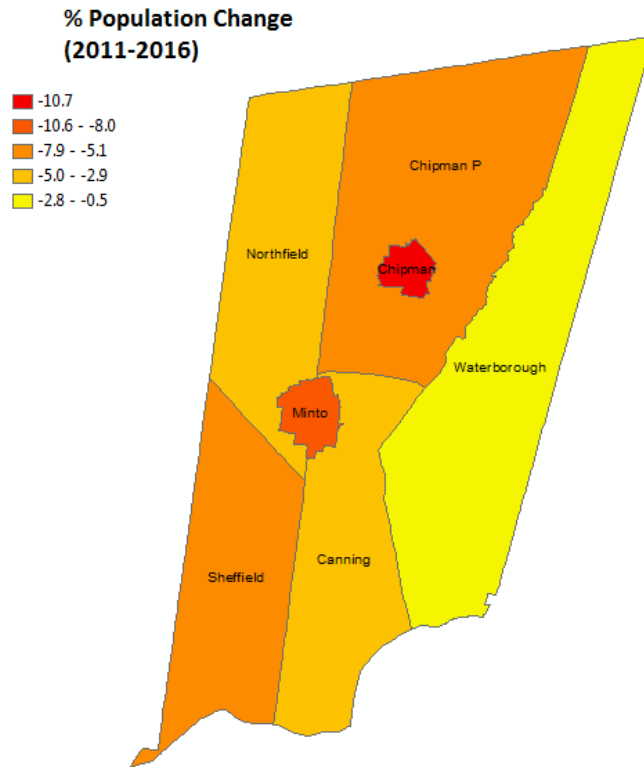


Figure 2: Population Change

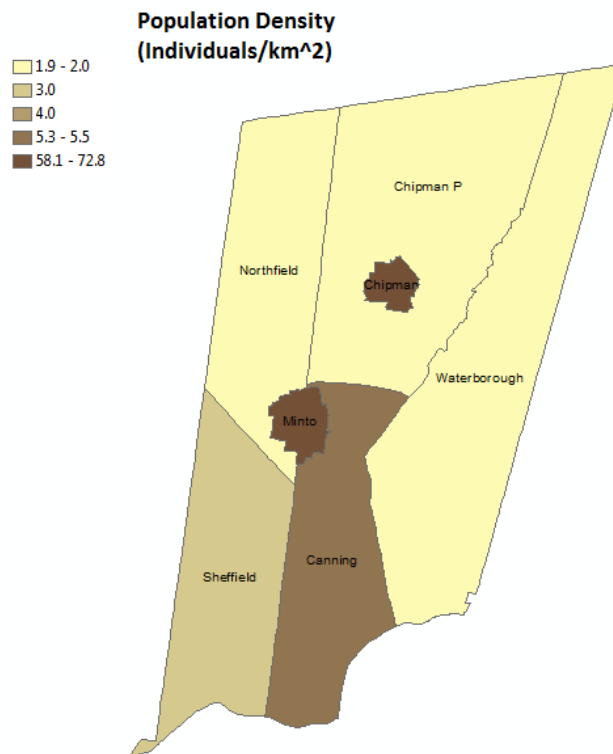


Figure 3: Population Density

The population of the study area skews to the right towards the older sector as compared to the rest of the province. The age groups presented in Figure 4 demonstrate this by showing a breakdown of age groups for each region of the study area when compared to the province as whole. The three age groups from 0-49 years are all underrepresented as compared to the province except for the 0-14 group for Sheffield. Conversely, the groups from 50-74 years are over represented in each region when compared to the rest of New Brunswick.

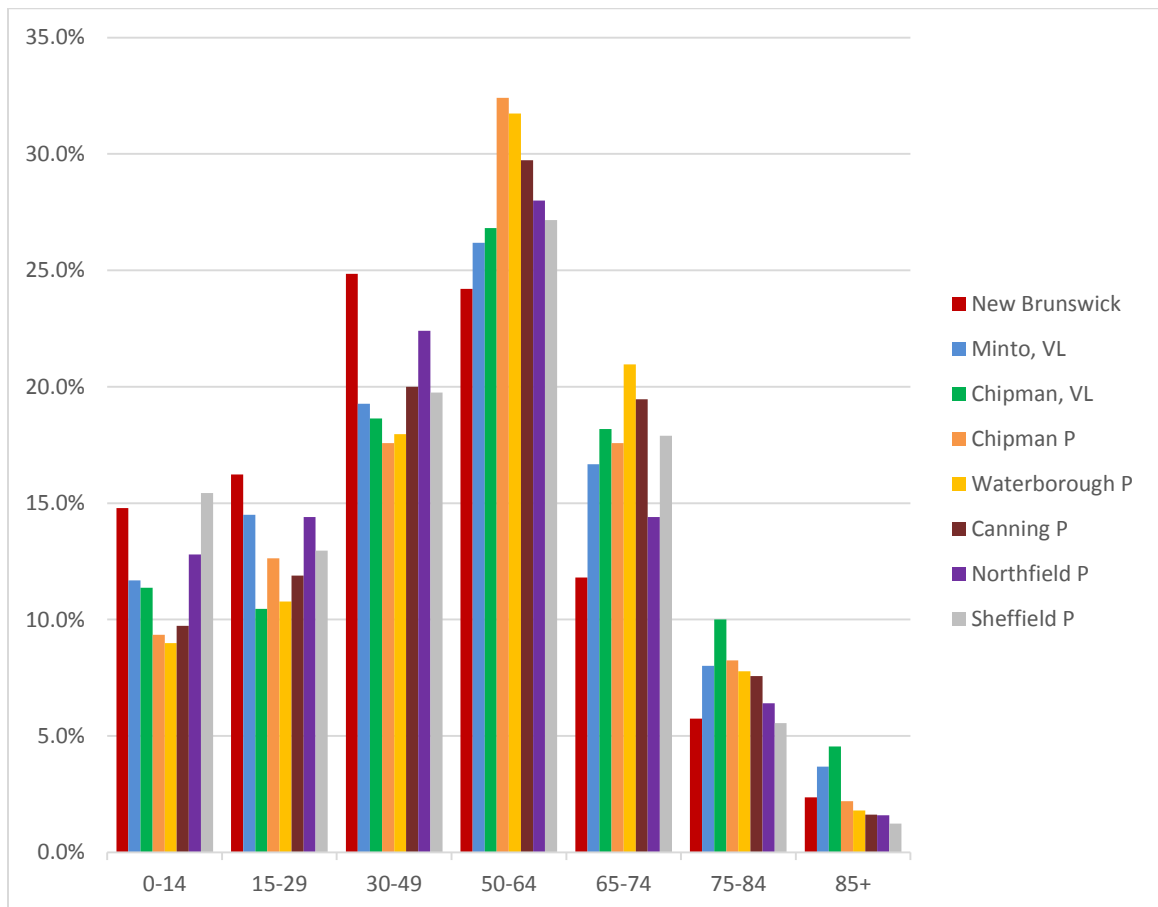


Figure 4: Age Distribution for Study Area and New Brunswick (2016 Census)

4.2 Socioeconomic Profile

The most recent economic data is from the 2016 Census. Community economic indicators such as the median individual income, low income percentage according to the after-tax low income measure and unemployment rate were examined. The availability of transportation alternatives is important for all segments of society, but especially for those who are economically disadvantaged as the costs of car ownership can be extensive. For this reason transportation is included prominently in the ESIC's Overcoming Poverty Together – Economic and Social Inclusion Plan. The socioeconomic data is presented in Table 3 as well as in Figures 5 to 7.

The compiled data demonstrates that the median incomes for individuals aged 15 years and over is generally below the provincial level. Canning and Sheffield have median incomes above the number for the province while all other communities are below that level. Each community within the region has percent low income and unemployment rates that are above the values for the province.

Table 3: Socioeconomic data

Community	Median Income	% Low Income	Unemployment Rate
Minto	\$22,940	29.5	20.0
Chipman	\$23,040	28.1	15.7
Canning	\$32,064	17.3	14.1
Chipman Parish	\$26,859	19.7	19.3
Waterborough	\$25,280	22.2	13.5
Sheffield	\$31,264	19.9	20.0
Northfield	\$25,536	22.6	17.5
New Brunswick	\$30,961	17.1	11.2

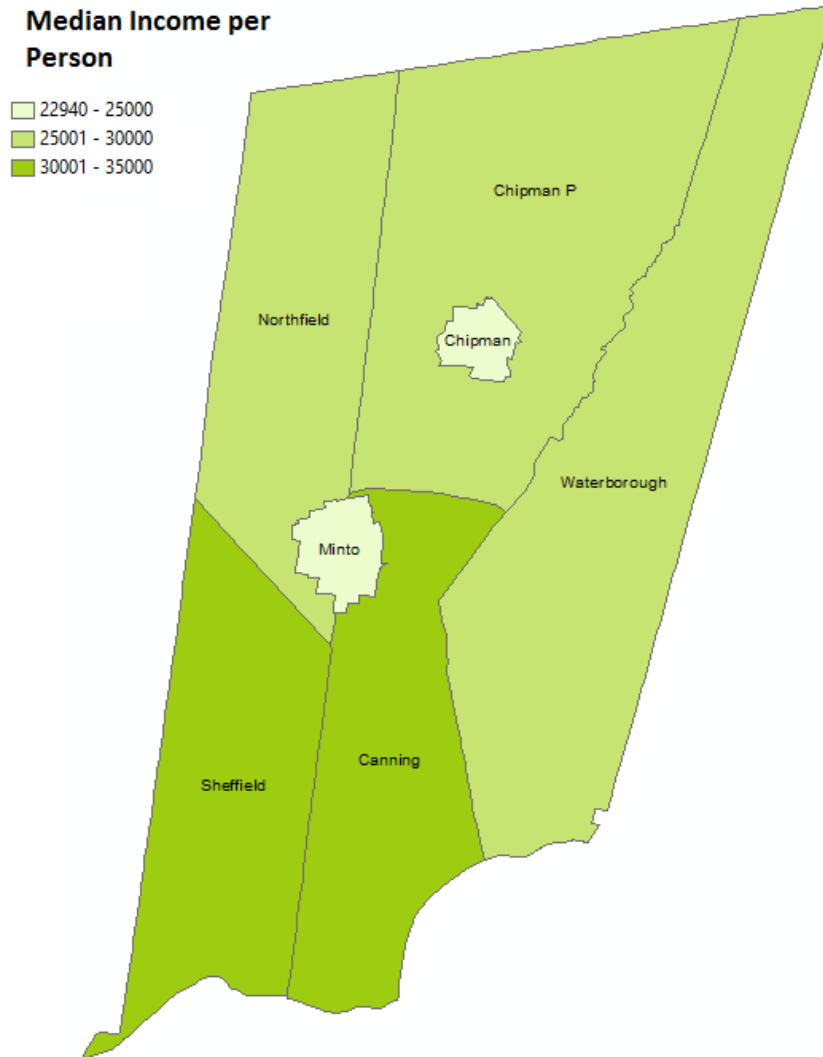


Figure 5: Median Individual Income

The median income for individuals 15 years and over is lowest in the Villages of Minto and Chipman. The highest levels are found in the southwest corner of the study area and are above the provincial median values. These two communities are the closest regions in the study area to the City of Fredericton and Town of Oromocto.

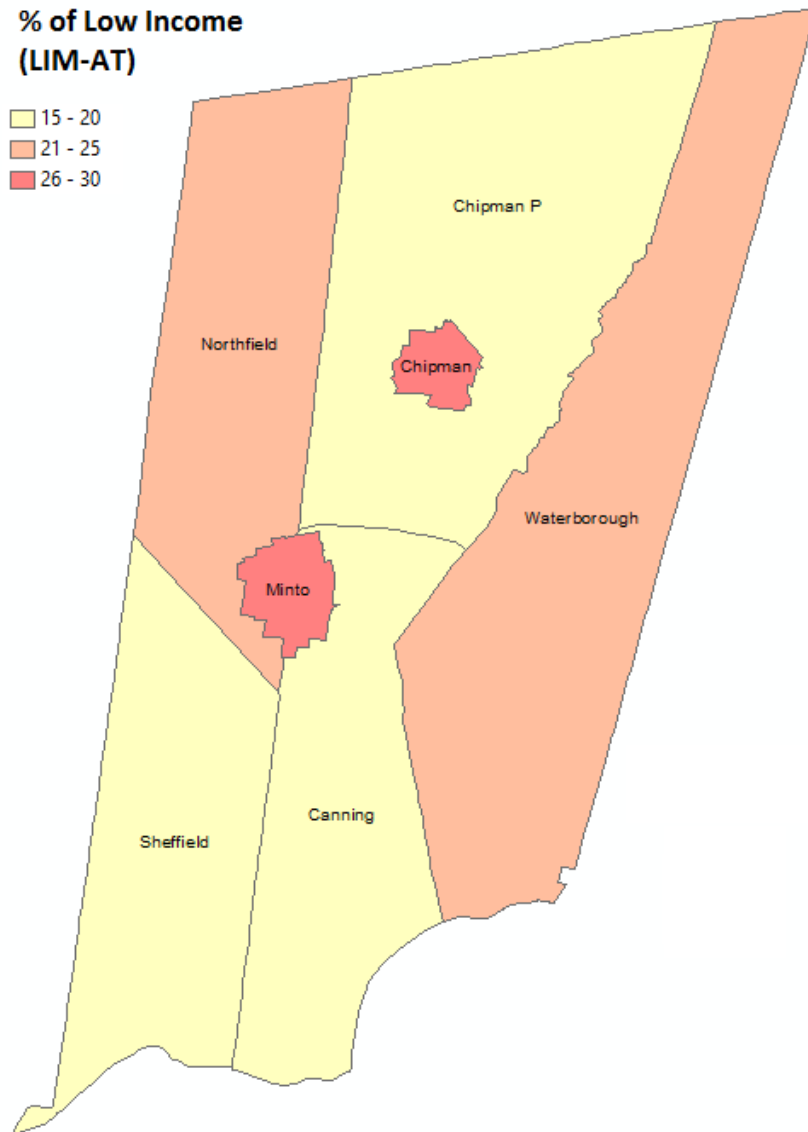


Figure 6: Percent Low Income (after-tax low income measure)

The largest percentage of after- tax low income measurements are in the Villages of Minto and Chipman which are approaching 30%. This mirrors the data found for median individual incomes.

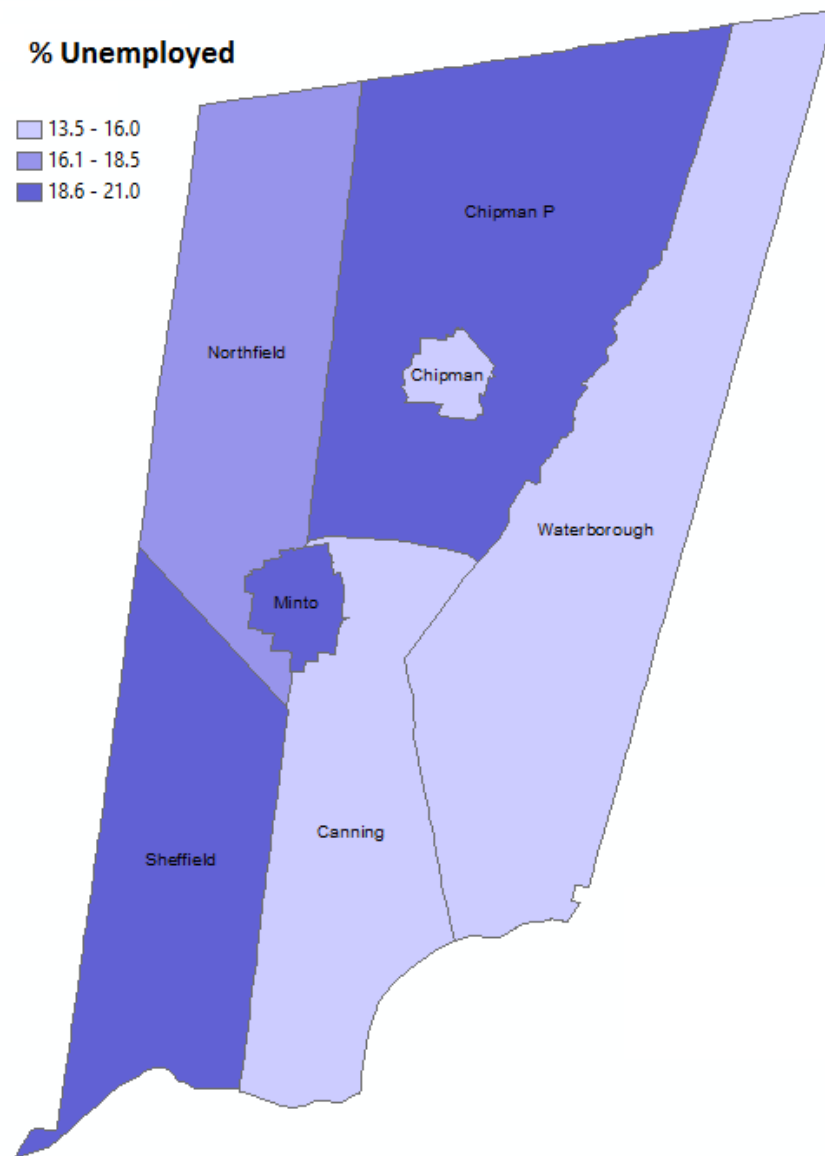


Figure 7: Unemployment Rate

The unemployment rate does not appear to follow any geographic pattern. Values are highest in Sheffield, Minto and Chipman Parish which are at or near 20%. The lowest rates are found in Chipman, Canning and Waterborough.

4.3 Commuter Profile

A commuter profile is intended to illustrate the travel patterns that individuals undertake when traveling to and from work. In order to develop a commuter profile there has to be quality information to draw upon. The issues with the 2011 NHS are well documented, but the data from that survey can still inform the creation of a commuter profile for the study area. The low response rate of the survey in some locations within the study area means that there is a gap in the information. Data from the LSDs with lower population levels have been omitted. This problem has appeared to be rectified in the 2016 Census however commuting flow results were not available at the time of report preparation (Statistics Canada, 2011). Table 4 shows the commuter flow data from the 2011 NHS and it is displayed graphically in Figure 8. The majority of individuals traveling for work from within the study area commute to Fredericton or Oromocto, two large employment centers that are 78km and 75km away from Chipman respectively. There are 400 commuters travelling to Fredericton and 140 travelling to Oromocto. There are also a number of workers who travel into the Village of Chipman for work. They come from Minto, Chipman Parish, Fredericton and residents of Chipman. There are 435 individuals who make these commutes.

Table 4: Commuter Flow (2011 NHS)

Place of Work \ Place of Residence	Chipman	Minto	Chipman P	Canning	Fredericton	Oromocto
Chipman	150	-	-	-	50	-
Minto	45	-	-	-	190	110
Chipman P	215	-	-	-	95	-
Canning	-	-	-	-	65	30
Fredericton	25	-	-	-	-	-

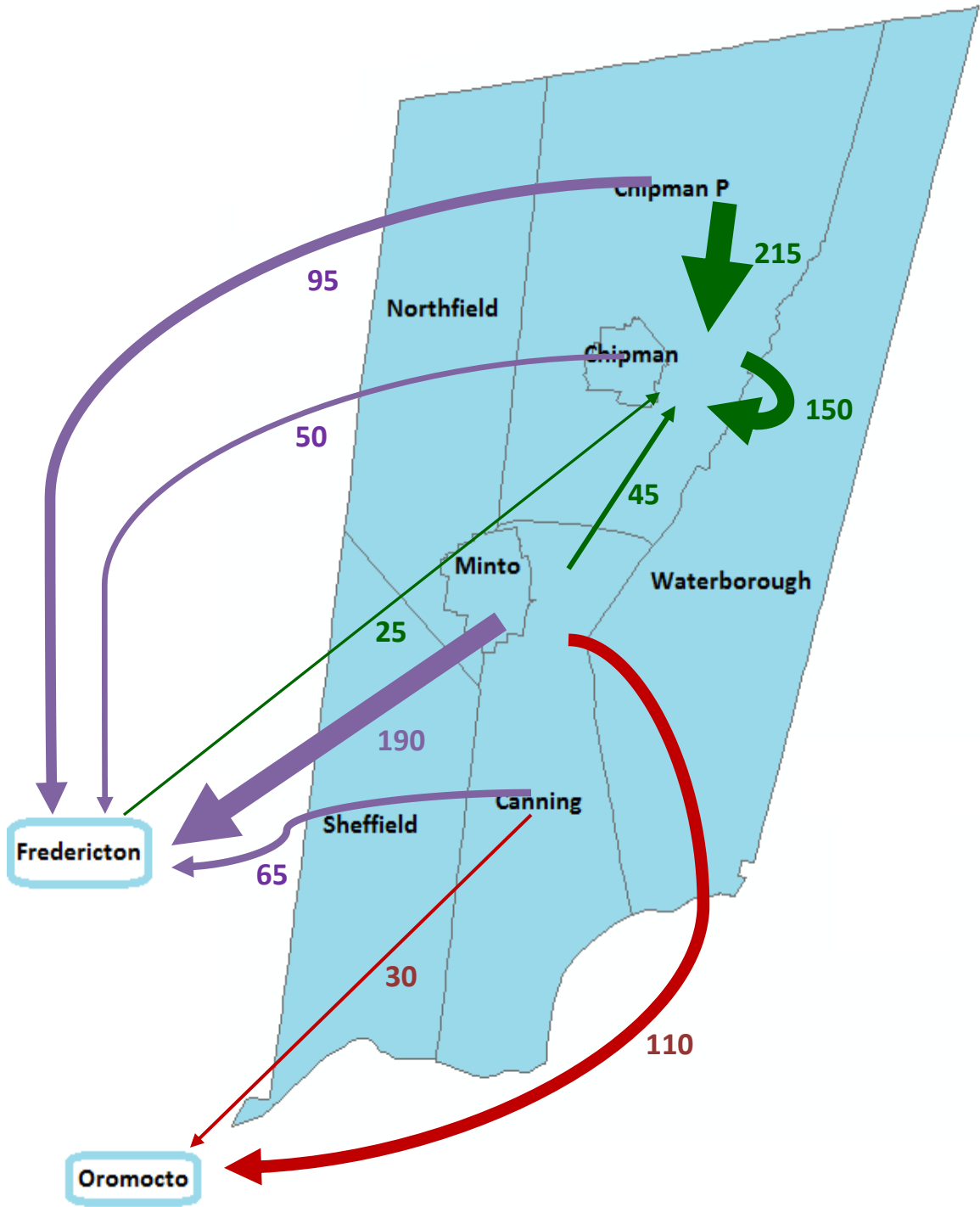


Figure 8: Graphical Representation of Commuter Flow

Figure 8 shows a graphical representation of commuter flow from the 2011 NHS in the form of vectors. Purple shows flows ending in Fredericton, Red in Oromocto and Green in the Village of

Chipman. The largest flows are from Minto to Fredericton, Chipman Parish to the Village of Chipman and within the Village of Chipman. With the eventual publication of the 2016 Census Commuter Flow data, the tables and graphics presented here can be updated to provide a full description of the commuter profile for all regions within the study area. It is anticipated that the data deficiencies present in the 2011 NHS will not affect the 2016 census data. Statistics Canada published response rates in February and the response rate for New Brunswick was 98.3%. This is greater than the 95.1% response rate from 2006 and the census that year had a full profile of commuting flow data.

Table 5: Commuting Duration and Time Leaving for Work

	Time leaving for work			Median commute time (minutes)
	5:00-6:59am	7:00-9:00am	After 9:00am	
Chipman	54%	35%	9%	15.0
Minto*	39%	31%	31%	12.9
Canning	37%	45%	18%	30.9
Chipman LSD	39%	38%	24%	15.3
New Brunswick	22%	61%	17%	15.4
<i>*May not add to 100% due to rounding</i>				

The 2011 NHS asks about the time spent commuting to and from work on a normal work day and the time the commute begins. As with the other commuting data, information was only available for the areas that had adequate response rates which are shown in Table 5. Of these communities, Canning had the longest median commute at 30.9 minutes and commuters in the Village of Minto had the shortest median commuter time at 12.9 minutes. Over half of commuters in Chipman Parish left for work between 5AM and 6:59AM. This could indicate that they are travelling longer distances to get to work but it may also mean that certain jobs start work at an early hour. Since this data includes all lengths of commutes, it is difficult to determine where commuters are going and when without more detailed information.

4.4 Community Profile Summary

Some of the notable results of the community profile are that Minto and Sheffield have the highest unemployment rate. The Villages of Chipman and Minto have the lowest median incomes per person while Minto has the highest percentage of low income individuals.

The Village of Chipman has the highest percentage of residents aged 75 and over while Waterborough has the highest percentage of residents aged 65-74, followed by Canning. Waterborough has the highest median age at 56.4. Each community experienced population decline from 2011-2016 with Minto seeing the highest percentage drop at -8%.

Minto has the lowest commute times in the study area though the majority of commuters travel outside the study area for work.

5 TRANSPORTATION INVENTORY

Understanding the transportation situation within the study area requires taking stock of the existing transportation options available to residents. Without knowing what does or does not exist it is not possible to identify solutions that may work within the current transportation framework. A transportation inventory was compiled through a telephone survey and data gathering exercises using the World Wide Web.

5.1 Telephone Survey

A telephone survey was carried out in order to gauge what types, if any, of transportation services exist within the region. A list of community groups, churches and businesses in the Villages of Chipman and Minto was compiled and a survey created in order to establish if any programs currently exist within the study area that provide transportation. The initial list was assembled with the use of community websites, phone directories and Google Streetview and contained 140 businesses, 17 churches and 18 community groups. During the survey process, some churches and community groups were found to no longer exist, had out of date contact information with updated information unavailable or were deemed not suitable for the survey. They were then removed from the contact list. All of the remaining churches (12) and community groups (13) were contacted. For the businesses, given resource limitations, phone calls were prioritized based on the perceived likelihood that they might provide a transportation service of some kind. It was assumed that the most likely environment for transportation services would be found within churches and community groups where there is often an increased focus upon civic engagement and providing help to other group members as a form of communal support. With this in mind, all of these groups were contacted via telephone and, if there was no response, a follow-up call was made the following week. Noting the importance of

receiving information from these groups, and the irregular office hours that may be kept, a third follow-up call came one to two weeks later.

The businesses were assumed to have a lower likelihood of providing a transportation service to customers or the community at large. With the current challenging economic circumstances in the study area it was expected that companies and smaller businesses would not want to take on the extra expense of providing such a service. The survey of businesses was carried out with a similar method to the community group and church survey. Businesses were called and if there was no answer a follow up call was made.

The breakdown of the inventory from each survey is located in Table 6, with a complete list in the Appendix. There was a very low response rate for the survey which, for the churches and community groups, was likely due to irregular office hours being kept. The survey was only carried out during business hours, Monday to Friday, but for churches, it would be more likely to get a response on the weekend because of church service schedules. The same can be said for many community groups, which are more likely to meet and have someone near the phone on the weekend.

Many of the businesses that were contacted did not have time to participate in the survey or did not answer when called. It was expected that many business owners and managers would not want to take the time away from their schedules to participate in a telephone survey. It would have been ideal to hear from as many businesses as possible; however, the results of the responding businesses confirmed initial assumptions regarding service provision.

Table 6: Transportation Survey Summary

	Inventory	Contacted	Responded	Provide transportation service
Churches	17	12	3	0
Community Groups	18	13	4	3
Businesses	140	47	8	0

The churches that responded all noted various informal arrangements where some parishioners provided transportation to church services and events to those who were in need. There was one transportation service provided by a church; however, it was not directly related to transporting parishioners and was a service provided in order to ensure medical test results reached their destination when other transportation options were unavailable.

Of the community groups that were contacted, three provided a transportation service. These groups were the Care 'N Share Family Resource Centre, Minto Senior's Club and Chipman Outreach for Seniors. One group provides drives for seniors to attend social events on a volunteer basis without remuneration. Another provides pick up and drop off services as well as home delivery services for seniors and others in need. This group's transportation service makes provisions for health care and life maintenance purposes such as banking and does this through paid employees using the group's vehicles. The last group provides coordination to assist group members in organizing their own transportation, relying on volunteers and their vehicles. They sometimes provide gas cards to drivers as compensation. In the past, one group attempted to organize a bus for the Grand Lake area to pick up group members and seniors but were unable to find any leadership willing to take on the task as the group was unable to take the lead because of insurance reasons.

Some comments about transportation needs included how the Scotiabank branch closure in Chipman has made it difficult for seniors to attend to their banking needs; the lack of taxi service in Chipman; the loss of the commuter bus from Chipman to Minto and Fredericton; and the limited availability of taxi service in Minto.

The survey of local businesses did not find any transportation services currently being provided. This was an expected finding as most operations are small businesses with few employees and do not have the resources to provide such a service. Some businesses did comment that they believed people felt that owning a car is essential to accessing employment and services in the region and therefore no services are provided. One comment indicated that seniors sometimes have difficulty when they take their car to an automotive shop for maintenance or repair work as they are sometimes stuck without transportation until the work is completed.

5.2 Existing Transportation Assets

The number of transportation alternatives to private vehicles in the region is limited. In the Village of Chipman, there are no known transportation assets apart from school buses for the local public schools.

In Minto there is a single taxi company that provides personal transportation: F&R Taxi. The W.G. Bishop Nursing Home owns a 12-seat bus; however, the bus is only available to nursing home residents due to liability issues and the substantial investment made by the nursing home in purchasing the bus. After the fire that destroyed the Minto Foodland grocery store, the nursing home offered the use of the bus to help residents buy groceries, but none of the four planned trips were made because they only received a single call of interest (CBC, 2017). There are also two schools served by school buses in the community.

6 EVALUATION OF TRANSPORTATION OPTIONS

Three potential alternative transportation options were considered for further study. They were a commuter bus service, similar to the service previously offered by Trius; a volunteer driver program; and a park-and-ride program. All three options respond to a slightly different transportation need and are presented with analysis below.

6.1 Evaluation of Commuter Bus Service

Previously Trius Inc. operated a commuter bus service that travelled between Chipman, Minto and Fredericton once per day in each direction. This service ceased operations during the end of March 2013, after at least 25 years of operations, mainly because of decreasing passenger numbers and a substantial increase in vehicle maintenance costs due to the age of the designated bus (CBC, 2013).

The idea of resuming a commuter bus service is a natural one because the service was regularly used by a small number of riders and it still has a place in the public consciousness. The previous service operated by Trius had to deal with slowly declining passenger numbers as well as large increases in maintenance costs (NBEUB, 2013). There are potential difficulties surrounding the re-introduction of a commuter bus service but there are also some positives to build upon and lessons that can be learned from Trius' experience.

6.1.1 Government Policy Landscape

In New Brunswick, intercity bus operations are governed under the Motor Carrier Act which is regulated by the New Brunswick Energy and Utilities Board. The NBEUB "licenses charter buses and it also approves the routes, schedules and fares for scheduled intercity bus service" (NBEUB,

2017). A commuter bus service between the study area and Fredericton or Oromocto would fall under the purview of the NBEUB and be subject to the Motor Carrier Act and Regulations.

6.1.2 Overview of Previous Commuter Bus Service

Trius previously operated a route from the Villages of Chipman and Minto to Fredericton once per day. The bus left for Fredericton in the morning and returned to Chipman and Minto in the evening, coinciding with the work day. Individuals predominantly used the commuter bus to travel to work in Fredericton and Minto while some used it to travel to school and to doctor's appointments. An online petition (Change.org, 2015) was created to re-establish the service, where the proponents indicated it was used to travel to work, school and doctor's appointments.



Figure 9: Trius bus used in previous service (CBC, 2013)

As a part of the discontinuation procedure, Trius was required to attend a hearing before the NBEUB. Prior to the hearing they presented ridership numbers for 2012 and three years' worth of condensed financial statements. Written statements were provided to the NBEUB from

Gordon Wheaton, President of Trius; Edward Farris, then Mayor of Chipman; and Carol Ann McElyain, a user of the service.

In Trius' letter requesting permission to discontinue the service, they stated that "our passenger count and related revenues have fallen about 6% per year" and "during the fiscal year 2012 our operating costs increased 16% from 2011". The cost increased is deemed to be related to the age of the bus used in the service. The letter also mentions that "operating income is somewhat overstated since we have not allocated any additional costs related to supplying back-up drivers and equipment whenever need. These costs have been absorbed by our Bus Division" (NBEUB, 2013).

TRIOUS INC.
 CHIPMAN/MINTO COMMUTER RUN
 FOR THE YEAR ENDED DECEMBER 31, 2012

	<u>Full Time Passengers</u>		<u>Day Trip Passengers</u>	<u>Total Revenue</u>
	<u>Number</u>	<u>Revenue</u>		
January	38	\$6,501	\$365	\$6,866
February	39	\$6,584	\$275	\$6,859
March	36	\$6,022	\$350	\$6,372
April	36	\$6,022	\$220	\$6,242
May	37	\$6,214	\$404	\$6,618
June	36	\$6,035	\$241	\$6,276
July	33	\$5,405	\$21	\$5,426
August	33	\$5,405	\$223	\$5,628
September	35	\$5,802	\$176	\$5,978
October	38	\$6,245	\$188	\$6,433
November	32	\$5,400	\$555	\$5,955
December	33	\$5,636	\$153	\$5,789
		<u>\$71,271</u>	<u>\$3,171</u>	<u>\$74,442</u>

Figure 10: 2012 Passenger numbers and revenue

The passenger count and related revenues along with condensed financial statements from the last three years are shown in figures 10 and 11. They demonstrate a small decline in full time passengers over the course of 2012 and when compared with revenue from 2011 and 2010, there is a notable decline.

The condensed financial statements from 2010 to 2012 show a major increase in vehicle maintenance costs. From 2011 to 2012 maintenance costs increased by 195% which, in dollars, was an increase from \$8,353 to \$24,664. Interest on long-term debt decreased from \$3,894 in

2010 to \$2,095 in 2011 to \$364 in 2012. Salaries and benefits also decreased each year. Fuel costs were greater in 2011 than the other two years while all other costs were relatively stable.

It appears from these statements that the age of the bus was indeed a major issue in the potential profitability of the service along with declining revenues. It is not possible to directly link declining revenues to the population decreases experienced in the region; however it is possible that they are related.

TRIOUS INC

STATEMENT OF DIVISIONAL OPERATION Chipman-Minto-Fredericton and Return Commuter Bus Run

For the year ended December 31

	Actual 2012 \$	Actual 2011 \$	Actual 2010 \$
REVENUE	74,442	78,301	85,543
EXPENSES			
Salaries and benefits	18,800	19,362	23,145
Vehicle maintenance	24,664	8,353	6,442
Fuel costs	11,963	14,431	11,992
Insurance	5,296	5,021	4,071
Office and administration	6,018	6,000	6,000
License	757	754	1,070
Telephone	0	129	174
Interest on long-term debt	364	2,095	3,894
Amortization	15,864	15,864	15,864
	83,726	72,009	72,652
DIVISIONAL OPERATION INCOME (LOSS)	(9,284)	6,292	12,891

Figure 11: Last three years of condensed financial statements

6.1.3 Estimates of Potential Ridership

“Estimating potential ridership for a proposed service can be difficult for all types of transit service, but in the case of rural intercity bus services, there are even fewer models or techniques available to the planner” (TCRP, 2002). The report, titled Effective Approaches to Meeting Rural Intercity Bus Transportation Needs and produced by the Transit Cooperative Research Program

in the United States, provides three categories under which ridership can be estimated. The categories are historical data, route models and trip rate models.

The historical data method uses historical information “on the route or service in question” and is “used to develop ridership and revenue estimates” (TCRP, 2002). This is often more useful when the route being served is still in operation. In this case, the route was discontinued four years ago, which is not too far in the past to be irrelevant.

The route models method has only a single demand model that is currently in use and “was developed in 1982 as part of an earlier NCHRP project addressing planning needs for rural intercity bus services” (TCRP, 2002). The model uses “the length of the route, the fare level (per mile), the frequency of service, and the population served” to estimate ridership. It was developed by using data from 89 Greyhound routes in 17 different states.

Due to the age of the model and the regulatory environment in which it was developed (before bus deregulation and industry consolidation), it is not likely to be very useful or accurate for the current situation in the study area.

Trip rate models use trip rate data to estimate the number of passenger trips generated in a town or village and then the estimates are summed for all of the intended stops along the proposed route. Trip rates are often calculated based on data from local providers. In the study area, there is no data that is comprehensive enough to develop a trip rate model.

It is not possible to know how quickly commuters in the study area would switch to using a commuter bus without conducting an in-depth survey. The availability of the last year of ridership numbers from Trius provides a good starting point for any estimate of the number of potential users of a new service. Even with this starting estimate, a new service should not

expect to see the same levels of ridership immediately as commuters found solutions to the previous loss of service and have changed their travel habits accordingly.

The Trius numbers indicate that for the final year of operation there was an average of 33 people using the service full time. There is no count given for the number of day trip passengers, only a revenue amount from their payment. This ranges from \$21 to \$555 which indicates a significant variability in day trip ridership. These numbers could indicate as few as one or two trips in a month or a few extra trips every weekday. Since it is not possible to plan for the variability in day trip passenger numbers, estimating the number of full time passengers provides a base estimate for future service planning. A starting estimate of 30 users was used for analysis purposes.

6.1.4 Cost Estimates and Analysis

A preliminary cash flow analysis was employed to identify the conditions for potential feasibility of the commuter bus service and if it makes sense to further explore its implementation within the study area. The analysis focuses on two cases: capital and operating costs for two bus types; operating costs only for one bus type. This was being done as there has been precedent for the capital cost of a bus to be supported by other levels of government or through other outside organizations which would remove a significant cost of a commuter bus service and could make the difference in whether it is viable or not.

Each case was explored through scenarios that include revenues from 30 passengers, a half load of 15 passengers and a full load of 33 and 37 passengers for two different sized buses. Each analysis examines the subsidy required if a two-way trip were charged at \$10.00 and \$8.50, values derived from the average price paid per day in 2012 by Trius users, brought forward to 2017 dollars, for full-time passengers. For the base case there is a sensitivity analysis comparing

the amortization costs of buying 33 and 37 seat buses at \$144,000 and \$155,000 respectively. These prices include HST. These two preliminary price estimates were provided by Crestline Coach. Two values for vehicle maintenance costs have been considered to provide some insight into the effect that maintenance costs have and why refining that number is important for how affordable tickets will be. The results are summarized in Tables 7, 8, 9 and 10.

The two bus models from Crestline Coach were chosen solely because of their capacities. With the initial ridership estimate of 30 users, the bus needed to accommodate this many riders and these were the two models that could do so. Having extra capacity available is also a desirable quality since there is likely potential for ridership growth. There are other bus dealers and bus models available on the market which can be examined in greater detail if a commuter bus service is to be restored.

In order to produce a cost estimate analysis, some assumptions were required which leaves room for variability in the analysis. Applicable costs have been grouped in a similar fashion to the financial statements from Trius as they contain all applicable cost categories involved in running a commuter bus service. Some monetary values have been estimated from these statements and brought forward to 2017 dollars using the Bank of Canada inflation calculator. Estimates conducted in this manner are Salaries and Benefits, Insurance and Administration costs. An interest rate of 4% has been assumed. This is likely a conservative estimate in the present economic landscape, but with the Bank of Canada having raised interest rates twice in the past year, it is prudent to consider the potential for increases in the cost of borrowing. All discount rates for present value calculations were assumed to be 2.5% because that is the discount rate prescribed by law in New Brunswick, in the absence of contrary evidence when determining future pecuniary damages (GNB, 2014). Rates of inflation were also assumed to be

2% for expenses that would be expected to rise over time as this is the benchmark the Bank of Canada has been trying to meet since 1991 (Bank of Canada, 2017).

Vehicle maintenance costs have been estimated using the Canadian Urban Transit Association Summary of Canadian Transit from 2016 provided by Wes Woods from Crestline Coach. This document provides a range of \$0.75/km to \$1.50/km. This data is an aggregate from all types of bus transit in the country. This type of average predominantly consists of transit buses in larger cities that run for considerably longer periods of time than a two trip per day commuter bus would. With this in mind, maintenance costs were estimated at the low end of the range at \$0.75/km as well as at the mid-point of \$1.125/km. If a commuter bus service is to be pursued as an option, coming up with more precise maintenance costs will be imperative, especially in light of the fact that a large maintenance cost increase was part of the reason Trius cancelled their bus service. More advanced consultation with bus dealers would help to narrow the potential range of maintenance costs.

Fuel costs have been estimated at \$1.20/litre and a fuel economy of 7 miles per gallon (2.97 kilometers per litre) for the 33 passenger bus and 6.5 miles per gallon (2.76 kilometers per litre) for the 37 passenger bus (NTSC, 2011). Estimated fuel costs are subject to high volatility while a major shift in fuel prices in the future could change the viability of the service. The estimated cost of fuel found was far greater than the amounts found in Trius' financial statements, meaning the estimated values might be conservative for budgeting purposes.

License and Registration fees have been determined using estimated gross vehicle masses (GVM), as defined in the Motor Vehicle Registration fee schedule (GNB, 2015) between 10,001 - 11,000 and 14,001-15,000kg, for the 33 and 37 passenger buses respectively. If a lighter bus

were used these costs would come down, but they are a small fraction of total costs under any scenario and any change in fees would be less than 1% of the annual expenses.

A service life of 10 years was assumed for budgeting purposes. In reality the length of service life will depend upon the model of bus that is chosen, the quality and amount of preventative maintenance that is performed, the manner in which the bus is driven and the number of kilometers the bus is driven. It was assumed that the bus would travel 160km per day for 250 days per year. A salvage value of \$4,068 for the 33 passenger bus and \$4,378 for the 37 passenger bus was determined using a Capital Cost Allowance of 30% as prescribed through Class 10 by the Canada Revenue Agency.

Table 7: Break Even Cost for Two-way Trip (Lower Maintenance Costs)

\$0.75/km Maintenance Costs			
	Cost per two-way trip to break even		
Purchase Price (max passengers)	15 passengers (Pessimistic)	30 passengers (Realistic)	Full Capacity (Optimistic)
\$0 (37)	\$24.32	\$12.16	\$9.86
\$144,000 (33)	\$28.57	\$14.29	\$12.99
\$155,000 (37)	\$29.41	\$14.71	\$11.92

Table 8: Break Even Cost for Two-way Trip (Higher Maintenance Costs)

\$1.125/km Maintenance Costs			
	Cost per two-way trip to break even		
Purchase Price (max passengers)	15 passengers	30 passengers	Full Capacity
\$0 (37)	\$28.32	\$14.16	\$11.48
\$144,000 (33)	\$32.57	\$16.29	\$14.81
\$155,000 (37)	\$33.42	\$16.71	\$13.55

Table 9: Potential Subsidies Required Per Year (Lower Maintenance Costs)

	\$0.75/km maintenance costs					
	15 Passengers		30 passengers		Full Capacity	
Purchase Price (max passengers)	\$10.00 fare	\$8.50 fare	\$10.00 fare	\$8.50 fare	\$10.00 fare	\$8.50 fare
\$0 (37)	\$53,696	\$59,321	\$16,196	\$27,446	\$-1,304	\$12,571
\$144,000 (33)	\$69,642	\$75,267	\$32,142	\$43,392	\$24,642	\$37,017
\$155,000 (37)	\$72,806	\$78,431	\$35,564	\$46,556	\$17,806	\$31,681

Table 10: Potential Subsidies Required Per Year (Higher Maintenance Costs)

	\$1.125/km Maintenance Costs					
	15 Passengers		30 passengers		Full Capacity	
Purchase Price (max passengers)	\$10.00 fare	\$8.50 fare	\$10.00 fare	\$8.50 fare	\$10.00 fare	\$8.50 fare
\$0 (37)	\$68,696	\$74,321	\$31,196	\$42,446	\$13,696	\$27,571
\$144,000 (33)	\$84,642	\$90,267	\$47,142	\$58,392	\$39,642	\$52,017
\$155,000 (37)	\$87,806	\$93,431	\$50,306	\$61,556	\$32,806	\$46,681

If the service attracted roughly half the capacity of the vehicle it is not likely to be sustainable as it would require fares in the region of \$24-\$32. With a \$10 two-way fare, at the high maintenance cost level, with low passenger numbers and a financed 37 seat bus, the expected subsidy would be over \$87,000/year. Comparatively, with a \$10 two-way fare, at the lower maintenance cost level, with a full capacity 37 seat bus it would require a subsidy of nearly \$18,000/year.

Conversely, with lower maintenance costs, a \$10 two-way fare and if the 37 passenger bus is fully purchased with funds from other levels of government a subsidy would not be required to operate the service.

The ideal situation would clearly be to purchase a bus through federal or provincial funds. The amortization costs of borrowing to purchase a bus ranges from 15%-20% of the annual expenses, depending on the purchase price. The percentage grows as the cost of a bus increases. This would also decrease the fare level required to make the service economically

viable because, as the fare price increases, commuters are less likely to consider switching their current travel behaviours.

The potential for subsidizing fares at the two analyzed levels incur a significant cost if the bus is purchased. The effect that maintenance costs have on the economics of a potential service is obvious. If a commuter bus service is to succeed it will likely have to be fully supported by its users with the best chance of success occurring if the bus can be purchased through another level of government.

6.2 Evaluation of Potential of Volunteer Driver Program

Volunteer driver programs exist in many jurisdictions across North America. These programs often fill gaps in transportation options for individuals who, for any number of reasons, do not or cannot drive themselves. Many programs cater to individuals and their medical needs, as well as other necessary trips such as grocery shopping, banking, travel to social events and sometimes employment. In rural areas, volunteer programs can be the only alternative to driving as public transit is often non-existent. Private taxis may not exist or may not be able to drive the long distances that can sometimes be required for a commute to jobs or to attend medical appointments.

6.2.1 High-level Cost Estimates

Data collected in 2016, by UNB graduate student Matthieu Goudreau, from three volunteer driver programs in New Brunswick provided a range of operating budgets and kilometres driven. The operating budgets show that as a program provides more drives, the cost of running the program decreases on a \$/km basis. The largest program has an annual operating budget of \$80,000 and provides 107,065.6km of drives which equates to \$0.75/km. The smallest program provides 3,104km at a cost of \$32,000 which is \$10.31/km. The third program provides

24,866.2km at a cost of \$56,900 which is \$2.28/km. Averaged over all three programs, the operating budget is \$1.25/km.

These three operating budgets clearly show that volunteer driver programs become more cost effective the more kilometres driven they provide. There are fixed costs associated with running a Volunteer Driver Program (VDP) but scaling up the number of drives does not add a commensurate cost to the operating budget. This means that the more drives provided, the cheaper it is, on average, to fund a VDP.

The Charlotte Country Dial-a-Ride (CDAR) service was a pioneering volunteer program in New Brunswick that has been in operation since 2005. In its first year of existence the operating budget was \$40,000 to provide 144 drives at a cost per ride of \$76. After six years the operating budget had increased to \$150,000 to provide 7176 drives at a cost per ride of under \$20 (Hanson, 2012). This would appear to confirm that as a VDP becomes more mature and successfully grows, the costs go down on a per ride or per km basis.

These numbers appear to show that keeping fixed costs down is a priority for new VDPs and that a lowering of the cost per kilometre or per trip only happens after the program has had time to grow and, in turn, attract a larger base of riders and drivers. A new VDP could expect costs similar to the smallest example provided, \$10.31/km, but if the program is successful and able to slowly expand after initial success, then costs per kilometre should decrease over time.

6.2.2 Ridership Scenarios

Estimating ridership of VDPs is a difficult task. This is because data collection is often not uniform, if it even takes place at all. This is especially true on a Provincial or State scale, where there may not be communication between different programs. Without data collection standards and a uniformity of data, the creation of predictive models is impossible. An entity

seeking to start a VDP can look to other successful programs as a model to emulate; however there is currently no statistical model on which potential ridership can be estimated based upon local demographics.

Work is currently being undertaken at UNB to standardize data collection across the various VDPs that exist within New Brunswick. With uniform data collection practices, creating a model to predict ridership is a possibility. However, the communal experience of starting a VDP across many different programs can provide a path forward for future VDPs. The collaborative nature of VDPs and the volunteer focus means individuals involved are normally willing to share their experiences with what works and what does not, which can be expected to help with any future VDP. The best way forward for any future VDP in the study area is to use the accumulated experience as a guide to ensure their own success.

In Charlotte County, 0.5% of the population is a member of the CDAR program (Hanson, 2014). This number is not directly applicable to the study area because of geographical differences; however if this number were achieved in the study area that would provide an estimate of 38 for a membership base.

It is also necessary to estimate the number of volunteer drivers that will participate in a program. Without an adequate supply of drivers, any program will not have a chance to get started. Data from the Charlotte County Dial-a-Ride shows they saw a volunteer driver rate of 1 driver for every 5 members (Hanson, 2012). For the study area this would mean 8 volunteer drivers if there were 38 members. Just as with the estimate of potential members, this is a coarse approach that does not take into account differences in local conditions and only produces a rough guess at what kind of participation may be expected. It might be expected

that the number of volunteer drivers would be in the range of one to two times the 1 in 5 estimate or 8 to 16 volunteer drivers.

The health effects of aging can make older adults (65 years and older) more vulnerable to transportation and mobility issues which may result in the potential to no longer drive themselves (Hanson, 2014). A senior-focused volunteer driver network in the United States records that 41% of their trips are to attend medical appointments. In New Brunswick members of the CDAR program in Charlotte County “are primarily over the age of 65 years and are female” (Hanson, 2014). The three most used trip types with CDAR, as provided by Pat Stafford, an independent consultant with the Charlotte County Community Inclusion Network, are 41% for medical transportation, 29% for work trips and 11% for personal errands (Hanson, 2012). The high number of seniors in the study area increases the likelihood that a VDP will be used to access medical appointments and the fact that 10% report problems with transportation to health care reinforces this. As well, rural older adults have found that accessing medical appointments is the most difficult trip purpose for which to find alternatives (Hanson and Hildebrand, 2011).

With no models or other methods to directly estimate demand, these rough estimates are a usable guide for a preliminary examination of the number of users and drivers that may be expected from a VDP program.

6.2.3 Possible Partnerships

Volunteer Driver Programs in North America are typically not-for-profit or charitable organizations. There are some opportunities for partnerships with the public and private sector. The ESIC of New Brunswick has provided funding for VDPs, often with the help of a local CIN (Hanson and Goudreau, 2017). The potential to partner with the health care facilities in the

region also exists either through funding partnerships or through outreach to patients informing them of the service. The three existing services that indicated in the telephone survey that they provide drives are potential partners in a VDP.

The experience of Charlotte County with CDAR is that there is a continuing reliance on provincial funding and this is an arrangement that will need to continue for the foreseeable future as there does not appear to be “a day in the future where dial a ride will be completely independent” (Hanson, 2012). Nevertheless, when compared to rural transit costs, volunteer driver programs are among the most cost effective solutions (Beverly Foundation, 2008). The federal New Horizons for Seniors program is a type of project based funding that VDPs can take advantage of with which CDAR has been involved. The CDAR is also partners with local businesses, foundations, charities, municipalities in the region and community fundraising events to supplement their funding of the program. These types of partnerships should be explored in the study area if a VDP is to be successful.

6.3 Evaluation of Potential Park-and-Ride Service

A park-and-ride program usually involves individuals driving a vehicle to a communal parking lot where they then leave their vehicle or are dropped off by others before continuing on the rest of their trip via another mode of travel, usually a bus or van. The potential exists for carpooling to take place at these types of facilities depending upon the goals of the local authority.

This type of travel is usually suited for work trips as the peak AM and PM travel periods are when the greatest number of individuals travel. Park-and-ride programs are not normally associated with tasks such as grocery shopping or personal errands as the time of making such a trip is not as predictable as work schedules or doctor’s appointments.

The State of Maine has a well-developed a statewide park-and-ride program and conducted a survey of its users in 2013. Given its similarity to New Brunswick in terms of geography and population, the survey results were explored to determine whether some of the experiences may be applicable to New Brunswick. The survey found that 87% of its park-and-ride users are using the system to get to and from work, with 68% of respondents indicating they used park-and-ride 5 times or more per week (Maine DOT, 2013). This suggests that a focus on commuters as the main park-and-ride users in a potential Minto-Chipman program would be consistent with program use elsewhere.

A survey of park-and-ride users in Seattle, Washington, conducted in 2015 indicated that 77% used park-and-ride for its affordability. 60% used park-and-ride for the convenience and relaxation it affords and 45% because driving takes too long (Stieffenhofer et al, 2015).

The park-and-ride concept may potentially fit with the travel patterns in Minto and Chipman due to the number of individuals who travel to work to common destinations outside of the communities. The two most common destinations are Fredericton and Oromocto. Data from the NHS show 400 individuals travel from within the study area to Fredericton for work (one-way distances of 51km from Minto and 78km from Chipman) while 140 make the trip to Oromocto (48km from Minto and 75km from Chipman one-way) (Statistics Canada, 2011). It is not known from the data whether these are daily trips, though they are the work destinations reported most often. The higher median age in the study area compared to the rest of the province suggests there may be an increasing need to travel to medical appointments in Fredericton, which could form another potential support base for utilizing park-and-ride. It is conceivable that lengthy trips to hospitals could be served by park-and-ride; however, the

timing of appointments for different individuals would potentially involve lengthy waits after arriving or before leaving.

Looking at the traffic counts in the region, from NBDTI in 2014, along routes from the study area to Fredericton and Oromocto indicate that there is a sizable amount of vehicles present. Route 10 sees 2740 vehicles per day to the west of Minto, while there are 1480 vehicles per day at the intersection of Route 690 and Route 105, on the way to Oromocto. The traffic volumes are shown as the Annual Average Daily Traffic (AADT) which takes the total volume in both directions for a year and divides that number by 365. Without more details, it is not possible to determine what percentage of these traffic counts are commuters as there are trucks and through traffic that use these highways as well. Even with the uncertainty, it would be expected that many of these vehicles would be commuting to work.

6.3.1 Population-based User Estimates

Park-and-ride programs are often operated in urban and suburban settings, where there are a large number of daily commuters; however when there are considerable numbers of commuters going in the same direction to the same destination, park-and-ride may be appropriate for more rural regions. Estimating potential ridership is problematic as many methods for estimating ridership are typically based on an urban environment. Park-and-ride is often used as a solution to traffic congestion as it removes some personal vehicles from the road network by consolidating travellers in a bus or carpool, but it can also be operated in order to make travel cheaper for commuters travelling to the same destination.

With the inherent imprecision of estimates, especially when not tailored to the local circumstances, the goal of estimating ridership was to determine an order of magnitude for the number of potential users. This was explored using a sensitivity analysis approach that assigned

levels according to realistic assumptions of upper and lower bounds drawn from relevant technical literature.

The Texas Transportation Institute (TTI) found in its research that 0.05-2% of residents make use of park-and-ride programs (Turnbull, 1995). This estimate is intended to be used in a preliminary stage of park-and-ride development. It was developed for large cities in Texas, so the numbers may not be directly applicable to the demographic situation within the study area. The estimate was developed using the market area for existing park-and-ride lots, in select cities, in Texas. It is unclear if the estimates were developed only for buses or if they include rail transportation. The estimated range was found to correlate with intensity of activity center development and congestion. Congestion is not a reason that park-and-ride is being explored but the intensity of development correlation is applicable to the current situation.

The estimated range of values serve as the lower and upper bounds applied to the study area population of 7522. This represents a range of approximately 4 people to 150 people in the region may make use of a park-and-ride program, based on this approach to estimation. The variability in this range suggests exploring other data to further refine estimates.

6.3.2 Modal Split-based User Estimates

Given the focus of park-and-ride is to facilitate work trips, commuting flow data from the 2011 NHS was used to gain insight into commuter behaviour and potential for ridesharing. The information that describes the usual mode of travel of the employed population, aged 15 years and older, with a usual place of work or no fixed workplace address as a percentage of the total population is particularly significant. Travel modes of commuters are organized into the following categories: car, truck or van – as a driver; car, truck or van – as a passenger; public transit; walked; bicycle; and other methods. Note that this is the “usual” mode of travel,

meaning the degree of use of other modes used by commuters in their journeys is not captured. The NHS commuting flow data for 2011 was limited to four of the seven largest communities within the study area, accounting for 70% of the total study area population.

Table 11: Typical Mode of Transportation Taken to Work (NHS 2011)

	Commuters (2011)	Personal Vehicle (Driver)	Personal Vehicle (Passenger)	Public Transit
Chipman	400	93%	3%	0%
Minto	885	73%	12%	2%
Canning LSD	190	76%	18%	0%
Chipman LSD	370	86%	6%	5%
Largest four communities	1845	80%	9%	2%*
<i>*May not add to 100% due to rounding</i>				

While there is currently no public transit in the communities, at the time that the 2011 NHS was in progress, the rural bus service operated by Trius was still running. The 2% of commuters reporting using public transit (approx. 40 people) is consistent with the size of bus employed by Trius at the time. It could be expected that eventual users of a park-and-ride would first draw from this population. The NHS data also suggest that approximately 9% of commuters (ranging from as low as 3% to as high as 18%) already demonstrate some form of carpooling behaviour without any formalized program. It is possible that a formalized program that facilitates carpooling may draw its users from this existing population and may also influence some modal shift over time.

The number of commuters that would shift to park-and-ride who are existing passengers in a vehicle and those who had used public transit is not known. The following table presents a sensitivity analysis that varies the percentage of commuters as vehicle passengers and as public transit users, which is then multiplied by a factor of 10/7 to grow the figures from the four largest communities to represent values for the entire study area. An upper limit of 150 people

of park-and-ride use (2% of population from the TTI) would translate into 100% of all public transit commuters and approximately 40% of existing vehicle passengers switching to park-and-ride. This is likely an optimistic target for modal shift, and initially it may make more sense to work with more conservative estimates that incorporate modal split targets and existing commuter flow information in the absence of any survey data.

Table 12: Park-and-Ride Commuter Sensitivity Analysis

Percentage of commuters as public transit users shifting to park-and-ride		Percentage of commuters as passengers shifting to park-and-ride		
		More pessimistic	More realistic	More optimistic
		1%	10%	40%
More pessimistic	25%	16	37	108
More realistic	50%	29	50	121
More optimistic	100%	55	76	148*
<i>*2% of population, consistent with TTI upper limits</i>				

6.3.3 Commuter Flow-based User Estimates

The largest single commuter flow recorded in the 2011 NHS for the study area is from Chipman Parish to Chipman (215 commuters). The distance between these two areas is approximately 7km and there are multiple roads connecting the communities. A park-and-ride lot may not facilitate carpooling between these locations in this case as individuals that have to drive a far distance to reach the park-and-ride lot are likely to simply continue the rest of their journey in their car instead of switching modes (Turnbull, 1995). The short distance between these two communities and the relatively diffuse settlement pattern within Chipman Parish mean that the personal car will likely remain the most used mode of commuting to work.

The two most frequently reported destinations outside of the study area for commuters in the four largest communities are Fredericton (50/78km away from Minto/Chipman) and Oromocto (48/75km away from Minto/Chipman). If the percentages for commuters travelling as

passengers in a vehicle (excluding the driver) and public transit are combined, they total 11% of all commuters for both scenarios. This suggests that 11% of the commuting population is already demonstrating ride-sharing behaviour and could be expected to be a source population for park-and-ride usage. The data in Table 13 shows an application of those percentages to the commuter flow data giving an estimate for the number of individuals that might be expected to make use of a park-and-ride or carpooling system based on more realistic and more optimistic modal shift scenarios, as per Table 12.

Table 13: Potential shift by vehicle passengers and public transit users

		To Fredericton	To Oromocto
Commuter Flow (2011 NHS)	4 largest communities	400	140
	Growthed to study area (10/7)	570	200
Scenario 1: More realistic shift to park-and-ride	10% of passenger commuters, 50% of public transit users	11	4
Scenario 2: More optimistic shift to park-and-ride	40% of passenger commuters*, 100% of public transit users	32	11
Complete shift of vehicle passengers and transit users to park-and-ride	100% of passenger commuters, 100% of public transit users	63	22
<i>*Maximum percentages from Table 9 to keep within TTI's maximum 2% of the population shifting to park-and-ride</i>			

The estimates of mode share at an 11% represent a situation where 100% of passenger commuters and public transit users switch to using an organized park-and-ride system, though a complete shift is unlikely. Scenarios 1 and 2 present more realistic and optimistic estimates of potential use in line with the percentages from Table 12, especially considering usage of such a system is likely to start at a lower level with the opportunity to grow over time. These commuters are engaging in this travel behaviour on their own, with no outside help. It is reasonable to expect that usage would increase if a well-designed service is created. It is

impossible to know how much of an increase would be seen so two shift scenarios provide some range for initial levels of use.

The data in Table 14 show the potential for commuters to shift to park-and-ride by varying the percentage of the total commuter flow by vehicle drivers. This is in comparison to Table 13 which shows the potential of park-and-ride users through a varying of passenger commuters and public transit users only.

Table 14: Potential shift to park-and-ride by vehicle drivers by modal shift percentage

		To Fredericton	To Oromocto
Growthed Commuter Flow (2011 NHS)		570	200
Percentage of potential vehicle drivers as commuters shifting to using park-and-ride	2%	11	4
	5%	28	10
	More optimistic 10%	57	20

The range of numbers estimated in Table 14 show the potential ridership at varying levels of commuter mode share. A low estimate of 2% was chosen because of its consistency with the perceived realistic shift in passenger and public transit commuters from Table 13. It is also a conservative estimate of drivers that might make the shift to park-and-ride compared to the total amount of commuters traveling to Fredericton and Oromocto. These commuters have already invested in vehicle ownership and because of this they are more likely to continue to commute via this mode. A smaller percentage may also deem that the savings on gas and personal benefits of not driving are enough to switch to park-and-ride.

Overall, it is important to reiterate that initial usage will most likely constitute a small percentage of commuters. The potential for growth is not currently known; however, determining the order of magnitude that a park-and-ride or carpool system could attract within the study area in the future would be helpful during the design phase. Achieving user targets of

148 for park-and-ride (2% of population upper bound) would require exceedingly optimistic modal shifts. More realistic estimates at the low end (10% of passenger commuters, 50% of public transit users, 2% of vehicle drivers) has approximately 22 people taking advantage of a park-and-ride system facilitating travel to Fredericton and approximately 8 to Oromocto. The most optimistic vehicle passenger and transit user modal shift (40% of passenger commuters, 100% of public transit users) would have 32 commuters travelling to Fredericton and 11 to Oromocto. Even though the growth potential has not been quantified, it is likely that usage would begin at a lower level and potentially slowly increase if it was found to be accessible, convenient and affordable. Determining a more accurate estimation will require a more detailed survey of commuters in the region.

The time leaving for work and median commute time data from the 2011 NHS is also helpful in analysis of potential ridership. There is no direct relationship between the time leaving for work or the commuting length and the potential for park-and-ride or carpool use. It is notable that the four regions in the study area all have a higher percentage of commuters leaving between 5:00-6:59am than the provincial average, as shown previously in Table 5. This is possibly due to the longer commutes required to reach Fredericton or Oromocto. The Chipman LSD is located the furthest distance from both of these communities and has the highest percentage of early commuters.

The median commute times are generally in line with the provincial numbers except for Canning which is nearly double in length. This is an interesting finding and may be more related to the local geography than any specific travel patterns. There are no arterial or collector highways though Canning and the main road, Route 690 follows a winding path through the LSD.

These numbers capture all commuters within the region, not just the ones who travel to Fredericton or Oromocto for work. The lower commute times indicate that there are many workers who are employed within communities of the study area.

6.3.4 Cost Considerations

The costs of a park-and-ride program can vary across different locations and there are different methods by which it can be implemented. In a setting outside an urban centre, the major costs associated with a park-and-ride program are the cost to acquire land for a parking lot or the cost of sharing an already existing parking lot, the cost of vehicle acquisition and related costs such as maintenance and fuel costs and salary for the driver. In the case where a park-and-ride program is primarily set up to serve a carpool system, there will not be any associated vehicle costs; however there will be a cost of setting up a system to match drivers and passengers.

Regardless of the type of system that is set up, there will always be certain costs associated with operating a parking lot. It is important to ensure there is proper lighting as both a safety and security measure. The cost of winter maintenance is a major consideration as well that, if not taken care of, will severely detract from the amount of potential users. Winter maintenance, general maintenance, trash/litter and security and lighting made up the top four subjects for written comments to the Maine DOT (Maine DOT, 2013).

The potential cost benefits for area residents should be taken into account when considering park-and-ride or carpooling. Reduced wear and tear on vehicles and lower gasoline usage can provide significant savings over time. Table 15 shows the vehicle-kilometers of travel that could be saved each day if a single vehicle transported every passenger to their destination. This measures the total amount of distance that would have been driven by each vehicle that has been taken off the road because of park-and-ride. The calculations are based upon 250 work

days per year, using the average distance from the study area to each destination. Each scenario is based upon the numbers from Table 13 which shows the potential for shifting to park-and-ride from vehicle passengers and transit users, which are the most likely potential users of such a program. Scenario 1 would see 10 less vehicles traveling to Fredericton and 3 less traveling to Oromocto while scenario 2 would see 31 less vehicles traveling to Fredericton and 10 less to Oromocto.

This is an imperfect estimation as the distances measured are taken from what Google Maps considers to be the centroid of each region. If a park-and-ride system is created, distances would be determined from the location of the lots. The calculation would also have to remove the distance required to travel from an individual’s home to the park-and-ride lot.

Table 15: Average Vehicle-Kilometers Saved

Average, one-way distance to destination		Vehicle-km saved per year (250 work days per year)			
		Scenario 1: More conservative		Scenario 2: More optimistic	
To Fredericton	To Oromocto	To Fredericton	To Oromocto	To Fredericton	To Oromocto
65.5km	59.2km	327,500	88,800	1,015,250	296,000

Costs for a potential carpool program were not directly examined; however, they would be orders of magnitude less than a park-and-ride system that requires the purchase of an appropriate vehicle. The only costs would be administrative costs and the full or shared cost of a parking lot.

6.3.5 Possible Partnerships

Park-and-ride programs can greatly benefit from partnering with existing organizations. One obvious partnership involves entering into a sharing agreement with an already existing, underused parking lot. Churches are a great example of this as their parking lots are used to

capacity only when parishioners are present. This often only takes place on the weekend. During the week, these parking lots often sit empty and a park-and-ride program could enter into an agreement to share the parking lot during the week. This would avoid the construction costs of building a new parking lot. There are many churches within the study area in which such a partnership could be explored.

If a bus is to be used as the vehicle to serve the park-and-ride program, care must be taken to ensure that the lot is big enough to accommodate this vehicle. However, if a smaller bus or van is used, then a parking lot of a simpler design is sufficient provided there are enough available spaces. This remains true if the lot is used for carpooling.

Another avenue for partnership is for large employers to provide some funding to provide a park-and-ride for their employees or if a number of larger employers joined together to provide park-and-ride transportation for their employees. It is unknown how many commuters may work for the same employer or for different employers in close vicinity to one another.

6.3.6 Planning Procedure

There is a six-step process, prescribed by the NCHRP, that has been determined to be the best method for planning and designing a park-and-ride facility or system. The steps are: Determine the need for a facility, determine the study area, estimate demand, determine the required size of the facility, evaluation of possible sites, final site selection and the actual design of the facility (Turnbull, 1995).

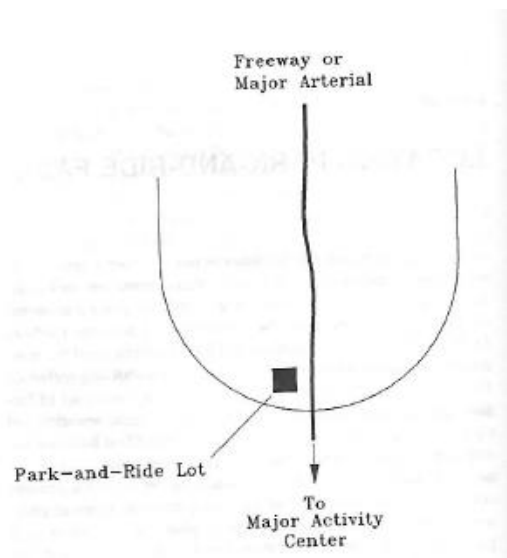


Figure 12: Lot Location (Turnbull, 1995)

One important takeaway from this six-step procedure is properly locating a park-and-ride lot. The preferred lot location is down stream of the catchment area within the community. Potential users will not want to back track to reach the park-and-ride lot. The ideal catchment area for a lot of this type is generally considered to be a parabolic or “U” shape as shown in Figure 12 (Turnbull, 1995).

Another important consideration is having the appropriate size of parking lot whether it is a shared lot or a new construction. Surface parking lots generally require 25-35 square meters per space (VPTI, 2017).

The most optimistic, initial number for potential users was found to be 43 (32 to Fredericton, 11 to Oromocto). This optimistic assumption leaves out drivers who may shift their travel behaviour. Since it is very difficult to estimate this number, and it is unclear how many would shift, it will be assumed that drivers will not initially change their behaviour.

With multiple origins and destinations for these work commutes, having a single lot may not make sense due to the required large catchment area. If a single lot is to be used, it would be expected to handle 43 users at 35 square meters per space, representing 1505 square meters. If the lot is designed at 25 square meters per space then it would need to be 1075 square meters. This is based on an assumption of one person arriving per vehicle, which is likely conservative. The segment of commuters that currently travel as passengers may continue to do so to a park-and-ride facility. If that were the case, then fewer parking spots would be required. Without conducting a travel survey it is difficult to determine what percentage of users would access park-and-ride facilities as passengers.

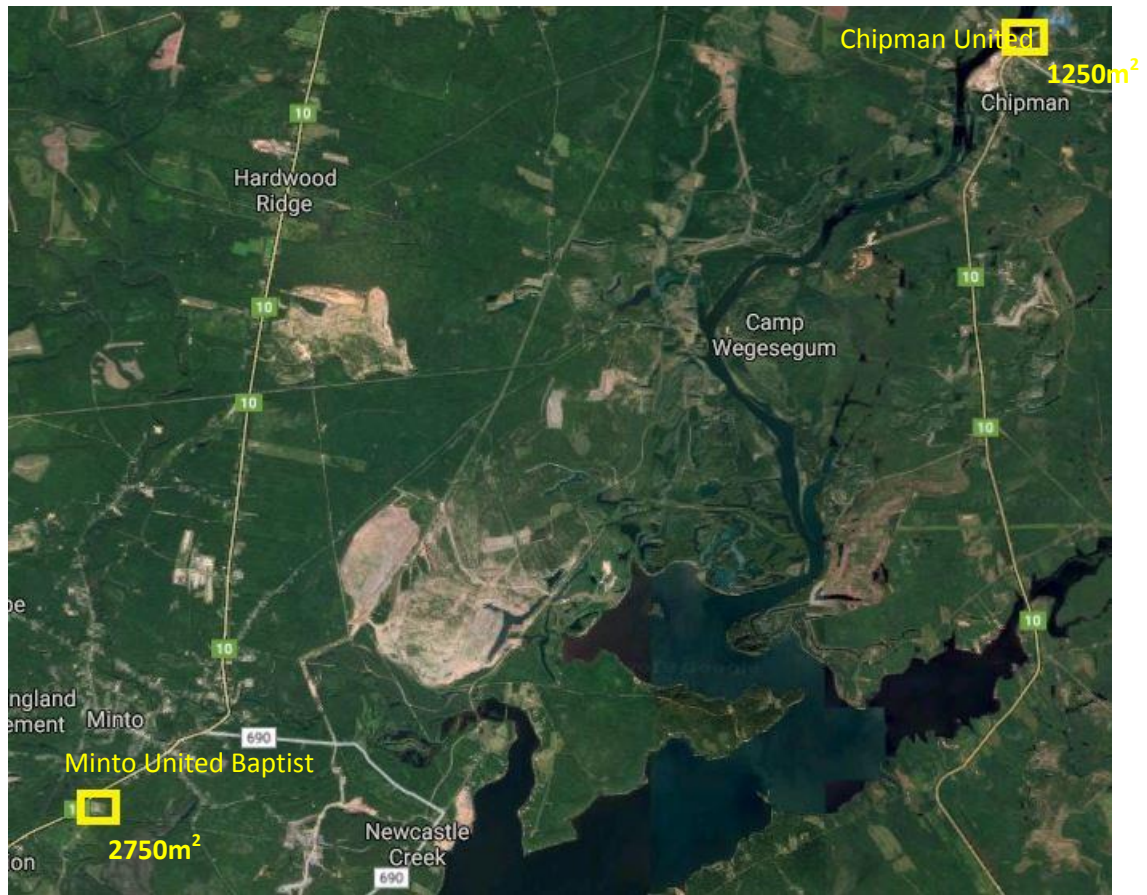


Figure 13: Potential Locations for Park-and-Ride Lots in Chipman and Minto

There are some smaller parking lots in the region that are this size and could accommodate this level of demand. If demand were to grow, there also exist a smaller number of large parking lots that could accommodate larger numbers of vehicles. If demand were to reach levels beyond the optimistic Scenario 2, it would likely use multiple parking lots as that would allow lots to be located closer to the origin of the work commutes, making them easier to access. Eliminating lengthy drives to a park-and-ride lot encourages usage since, if a commuter needs to drive a considerable distance to reach a lot, they are likely to skip the park-and-ride and drive themselves the rest of the way. For users who might be dropped off, it would ease the burden of having someone drop them off far from home.



Figure 14: Minto United Baptist Church and Parking Lot (2750 m²)

Church parking lots, such as the Minto United Baptist Church or the Chipman United Church, are well located and are a reasonable size that could accommodate many vehicles. The Minto United Baptist Church parking lot, measured using Google Earth, is approximately 2750 square meters, which could provide space for 110 vehicles at 25 square meters per space. The Chipman United Church lot is approximately 1250 square meters, which could hold space for 50 vehicles at 25 square meters per space. There are many other church parking lots in the region which would also be large enough to be used for park-and-ride or carpooling purposes.



Figure 15: United Church of Canada (Chipman) and Parking Lot (1250 m²)

These two church parking lots have the capacity required for the optimistic initial use scenario. There is also room to accommodate a large increase in the number of users if such a program proves successful. The infrastructure needed to support a park-and-ride or a carpool system exists in the study area which will increase the chances of a successful program.

7 DISCUSSION

The goal of this paper was to help understand the transportation needs within the study area. The purpose of understanding these needs is so that appropriate solutions can be devised to help solve the transportation issues in the study area as identified through this report. There are some future steps that could be undertaken to move the discussion forward pertaining to the three specific transportation solutions outlined in this report.

The first step is to hold public community engagement sessions. Originally intended to be a part of this project, two public forums (one in Minto, one in Chipman) should endeavour to discuss directly with local residents their perspectives, concerns or ideas that were not part of the telephone survey. Holding these sessions with the help of local business groups or community groups can help obtain participation and foster community involvement. This report provides three options with an introductory analysis that can guide the engagement sessions.

The goal of these community sessions should be to determine which of the identified three options (if any) should be pursued by the communities, and then identify champions within the communities that will take responsibility for moving the options forward.

The estimates for costs and ridership of each potential option were of vary degrees of utility depending upon the quality of data sources that informed the estimates. The estimates for the commuter bus option were based upon past economic data, which did not provide a model to accurately predict the future but could be reasonably relied upon to attach an order of magnitude to costs. By contrast, the VDP and park-and-ride options used less reliable information but still gave an order of magnitude to cost estimates.

The data limitations encountered placed constraints on analysis, but recognizing the limitations in the travel data can inform future data gathering exercises. A travel survey would be beneficial if there is need to look beyond commuting flow; however, the demographics of the study area and the cost of administering a travel survey requires to need to weigh benefits and costs of data gathering exercises.

Looking to the future, if considering other financial partners (e.g. provincial, federal), may need to conduct further analysis to justify benefits compared to costs, depending on funding program criteria. Conducting a benefit-cost analysis, using an analytical hierarchy process or developing a specific decision matrix are all potential tools that can be used to decide on the appropriate transportation option to consider for implementation in the study area. While the financial aspect of any solution is extremely important, consideration for social and cultural issues and inclusivity is critical as well. Transportation impacts communities in ways beyond the up-front monetary value as there are indirect costs to things such as not having reliable access to healthcare appointments or potential employment.

8 CONCLUSIONS

This report is intended to provide guidance to support transportation decision-making in the Villages of Minto and Chipman and the surrounding communities. The first step was developing a profile of the study area. It is predominantly rural in nature consisting of five Local Service Districts, anchored by two villages; Minto and Chipman. As of 2016 there are 7522 residents in the study area and there has been a 6% decline since 2011. The median ages range from 50.8 to 56.4 years which are higher than the provincial median age of 45.7. The region is experiencing population decline and challenging economic circumstances. The unemployment rate and percent of low income individuals is higher in all seven regions of the study area than the provincial averages. In some communities the unemployment rate is almost double the provincial rate. Even though there are demographic and socioeconomic challenges to overcome within the study area, this means there are opportunities for new solutions that are suited for the communities within the study area. Local engagement was initiated in order to determine what kinds of transportation options were in existence.

Consultation with local elected officials from Minto and Chipman took place at the beginning of the project with representatives from each village serving as points of contact for the project. There was also consultation with the community developer at the Queens North Community Health Centre. The original intention was to hold public engagement sessions in both villages; however, due to a combination of staff turnover and a major community emergency (the Minto Foodland fire) community priorities were focused elsewhere and those sessions did not take place.

A transportation survey was the sole form of direct community engagement that took place, where community groups, churches and businesses were surveyed about their transportation

needs and whether or not they provided transportation services. It was determined that aside from direct engagement with community members, this was the best method to discover what, if any, transportation services existed within the study area. Community groups, churches and businesses were the most likely places where these potential transportation services would exist.

The transportation survey demonstrated that not many transportation options exist within the study area apart from owning a personal vehicle. No businesses that responded to the survey offered any transportation services to customers or the community. Two churches had informal transportation services where congregation members drove others to and from church services and events if they could not do so themselves. One church was also involved with transportation for medical test results; however, this was a somewhat informal service provided to members of their congregation as needed and did not involve transporting people. Three community groups provided a transportation service to their members. Two of these groups did so for seniors and one for parents of smaller children.

There were low response rates for the survey, especially for the churches and businesses. This was not entirely unexpected as churches often hold irregular office hours and therefore can be hard to contact. The predominance of small businesses coupled with the reality that owners and managers often are too busy to participate in a telephone survey likely led to the low response rates for businesses.

An inventory of transportation assets in the community was taken separately from the telephone survey. The inventory indicated that there was one taxi company in the study area that operated in Minto. A nursing home in Minto owned a 12-seat bus for use by residents only.

The public schools in the study area also were serviced by school buses which could be considered underutilized transportation assets.

Three possible transportation options were analyzed which were a volunteer driver program, a commuter bus service and a park-and-ride program. The analysis included a high-level evaluation of costs, potential ridership scenarios and identification of potential partnerships in the public, private and not-for-profit sectors.

The analysis was completed to provide estimates for the viability of each option. No recommendations were made for which options should be preferred as that would require further analysis and potentially a detailed transportation survey in order to better understand transportation behaviour within the region. Relying upon Statistics Canada data is useful but it often does not capture the degree of detail desired for estimation and analysis using standard practices.

The examination and analysis of each alternative transportation solution is meant to provide a foundation for any future, in-depth feasibility analyses. The relative merits of each option can be weighed against community interest and costs.

The preferred option for acquiring a bus for a returning commuter bus service would be to purchase the bus through outside funding opportunities with the federal or provincial governments or through some other means. Any economic analysis is highly dependent upon the maintenance costs for a vehicle as well as fuel costs which can be highly variable over time and are difficult to accurately estimate. A more thorough transportation survey could determine the willingness to pay for such a service as well as how many individuals would make use of the service. Having these passengers and fare estimates is paramount to developing a sustainable commuter bus service. For the service to be viable, without requiring subsidies, the

two-way fare would need to be \$10.00 with a full capacity load of 37 passengers. Maintenance costs would need to be \$0.75/km, which is the low range of estimated costs. Other bus models or sizes may prove viable under similar cost estimates.

If the service only attracts 15 passengers, approximately a half-load, maintenance costs are in the region of \$1.125/km with passengers paying \$8.50 for a two-way fare and a 33 passenger bus, the commuter bus service is estimated to require an annual subsidy of approximately \$90,000. These values are based on estimates for fuel, maintenance costs, and other values that are subject to change; changes in underlying assumptions will change the estimates.

A volunteer driver program could be a realistic transportation option because of the success of other similar programs across the province. Being able to draw on previous experience provides an excellent opportunity to help any new VDP begin operation. Budgets for some VDPs in New Brunswick have been in the range of \$32,000-\$80,000/year, depending on the size and ridership, though data continues to be collected. This works out to a cost of \$10.31/km-\$0.75/km. Costs may be high starting out and securing adequate and reliable funding sources may prove challenging but the ability to start out small and scale up a program as need be makes a VDP an attractive alternative transportation option. The study area has differences and similarities to other regions where VDPs operate so some of their practices can be copied and some adapted to the needs within the study area.

Applying the Charlotte County Dial a Ride program's historic ridership and volunteer rates to the study area can give a justifiable estimate of potential ridership in the study area of 38 users along with a volunteer base in the vicinity of 8-16 drivers.

A park-and-ride program is similar in many ways to a bus service. It involves users driving or being driven to a parking lot to be picked up by another vehicle such as a bus or van, or by

another driver. In this way, it can be utilized by individuals who own a car and do not wish to drive it all the way to their destination or persons without a car. The drawback is that if you do not own a car, another means must be found to travel to the pickup lot. Costs are limited to vehicle acquisition costs and would be similar to the commuter bus in that regard. There are also costs associated with the lot itself. These costs can be shared through a partnership with existing lot owners which removes the relatively large expense of constructing a new lot. There are many potential partnerships that exist within Minto and Chipman.

There is limited information available on estimating park-and-ride usage in a rural context; therefore several different methods were employed to develop a range of estimates given some broad figures from other jurisdictions. Realistic estimates suggest an order of magnitude of 60 potential park-and-ride users, split between Fredericton and Oromocto. Existing parking lots at the Minto United Baptist Church and the United Church of Canada in Chipman could provide sufficient space to satisfy these estimates during the week. There are other parking lots in the study area that could also provide enough capacity which gives a potential park-and-ride flexibility in how it serves the communities in the study area.

A carpooling program, where a parking lot is constructed to allow for carpooling instead of requiring a dedicated vehicle, was briefly examined as a concept. Costs for a carpooling program were not directly examined but it is known that this type of behaviour already exists within the study area. A move to formalize this behaviour would have administration costs many orders of magnitude less than a park-and-ride program that included purchasing a vehicle and could be explored as an alternative transportation option that would connect commuters in a more formal manner.

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10 APPENDIX A: Survey Questionnaires

Chipman & Minto Community Group/Church Survey

1. Name of the group/club: _____

2. Location: _____

3. What is the primary focus of your community group/church?

Arts & Culture ___

Social Services ___

Education ___

Community Benefit ___

Health ___

Other ___

4. How many active volunteers are involved with your community group/church?

1-5 ___

6-10 ___

11-15 ___

16-20 ___

21+ ___

5. How large is your active membership/congregation?

1-5 ___

6-10 ___

11-15 ___

16-20 ___

21+ ___

6. Have any of your group members/congregation expressed any difficulties accessing transportation?

Yes ___

No ___

7. Does your group/church provide any transportation services to its members?

Yes ___

No ___

8. Does your group/church provide any transportation services to the community at large?

Yes ___

No ___

(If YES to Q7 or Q8) – 9. Choose the statements that best describe the nature of the transportation provided by or employed by your organization: [Select all that apply]

We provide pick up and drop off _____

We arrange for taxis _____

We visit or deliver essentials to people in their homes _____
We help coordinate programs to assist people with organizing their own transportation _____

10. What transportation assets does your organization/church employ? [Select all that apply]

We own and operate our own van or bus _____
We rent or borrow a van or bus _____
We own and operate our own automobiles _____
We rely on volunteers to provide their own vehicles _____
We provide wheelchair accessible service _____
Other: _____

11. Does your organization/church use any of the following to support the transportation activities of its organization/church? [Select all that apply]

Volunteer drivers using their own vehicle with no compensation _____
Volunteer drivers using their own vehicle with some compensation _____
Paid drivers employed with or hired by the organization _____
Drive vouchers/Reimbursement for taxis or personal vehicle use _____
Other: _____

12. What trip purposes can be taken or supported with your transportation service? [Select all that apply, and identify which is the most frequent]

Health (e.g. medical appointments) _____
Work/Education (e.g. job interviews) _____
Life Maintenance (e.g. shopping, banking) _____
Quality of Life (e.g. visiting friends and family, social events) _____
Other _____

13. Is there anything else you would like to add about transportation within your community group/church or within your community that you think would be relevant to this study?

Chipman & Minto Business Survey

1. Name of the business: _____

2. Location: _____

3. Type of Business:

Agriculture ___

Construction ___

Culture and Leisure ___

Energy ___

Health/Education ___

IT/Communications Tech ___

Manufacturing ___

Natural Resources ___

Retail and Wholesale ___

Science and Technology ___

Transportation ___

Travel and Tourism ___

4. How many people are currently employed at your location?

None ___

1-4 ___

5-19 ___

20-49 ___

50+ ___

5. How do your employees typically travel to work? (Check all that apply)

Drive own car ___

Share ride with co-worker(s) ___

Driven by someone else ___

Walk or Bike ___

6. Have any of your employees reported that they have difficulties in securing reliable transportation to work?

Yes ___

No ___

7. Have you ever had an employee leave your firm because of their difficulties in securing reliable transportation to work?

Yes ___

No ___

8. Do you do anything formal to assist your employees with their transportation needs?

Yes ___

No ___

(If Yes to Q8) – 9. What type of transportation assistance is provided to your employees?

Provide carpool/vanpool ___ Provide a pickup service ___ Provide bike racks ___
Work from home ___ Other ___ – What? _____

10. Is there anything else you would like to add about transportation at your business or in your area that you think would be relevant to this study?

11 APPENDIX B: Inventory of Businesses, Churches and Community Groups

There are numerous community and church groups in the region. They are listed according to their location.

Chipman:

Chipman United Church
Christian Life Center
Cumberland Bay Baptist Church
First Chipman United Baptist Church
Fundamental Baptist Church
Saint Augustine's Anglican Church
Salmon Creek United Baptist Church
Second Chipman United Baptist Church
Care 'N Share Family Resource Centre Inc.
(Preschool drop-in centre)
Chipman Community Care (Food & Clothing Bank)
Chipman & Minto Lions Club
Chipman Outreach (for Seniors) Inc.
Chipman Public Library
Royal Canadian Legion (Branch 74 Chipman)

Minto:

Bethel Baptist Church
Christian Community Church
Holy Rosary Catholic Church
Kingdom Hall of Jehovah Witness
Newcastle Creek United Baptist Church
Pentecostal Gospel Lighthouse Church
St. Michael's All Angel Church
Trinity United Church
United Pentecostal Church Minto
United Baptist Church of Minto
Anglican Church Women
Catholic Women's League
Chipman-Minto Lionettes
Grand Lake Masonic Lodge
Knights of Columbus
Minlak Training Programs Inc.
Minto Community Resource Centre
Minto Community Youth Centre
Minto Public Library
Minto Senior's Club
Royal Canadian Legion (Branch 12 Minto)

There are numerous enterprises within the region ranging from home-based businesses to larger industrial operations that employ dozens of workers. They are listed according to the sector in which they operate.

Agriculture

Darin Clark Christmas Trees and Blueberries
Stevenson Road Farms
Market Garden
Grand Lake Silviculture

The Bear's Den & Take Out
Village Bakery, Restaurant & Café
Robin's Chipman
Asian House
Capt. Sub
Greco Pizza
Lucky Garden Restaurant
Omega Restaurant
Sunrise Diner
Tim Horton's
Twins Pizza
Cochrane's Corner Store
Great Canadian Dollar Store
Minto Foodland
Minto Centennial Arena

Construction

DiCarlo's Building Centre
Lemons Lumber & Home Hardware
Affordable Roofing and Renovation
Grand Lake Window and Door Inc.
Pat's Carpentry
CM Boyne Electrical Services
Edith's Electrical
Bob's Plumbing & Heating
Liberty Air HVAC
John Fearn Excavating Services
Lewis' Landscaping
Ward's Contracting
Gilbert's Welding
Mowat's Well Drilling
WM Langin & Son Well Drilling
McElwain, K.E. Ltd.

Energy

C.G. Lemon's Fuels 2000 Ltd.
Irving Oil
Harold Lemon Fuels & Contracting Ltd.

IT/Communications Technology

Computer Dan
Toni's Computer Repair & Consulting

Culture and Leisure

Chipman Centennial Arena
Chipman Bowl-A-Rama
Chipman Marina
Horse Haven Stables
Chipman Funeral Home & Chipman Cremation Centre
Hogg Funeral Services
Grand Lake Mirror Ltd.
Mirror Printing (Division of Grand Lake Mirror Ltd.)

Health/Education

A-2-Z Learning Centre
Early World of Learning Day Care & Preschool
North Minto Residence
Mercy's Residence
Minto Dental Clinic
Minto Optometry Clinic

Manufacturing

Eastland Industries
R & D Welding Ltd.
RPS Composites
Thing5
Tire Recycling Atlantic Canada
W&E – Wobo Industries

Natural Resources

Grand Lake Timber (J.D. Irving Ltd.)

Retail and Wholesale

Grand Lake Flower & Gift Shop Inc.
Victoria's Dream Cakes
Clark's Bottle Exchange
Armstrong Convenience
Highway 10 General Store
Salmon Creek Convenience
Salmon Creek Tanning
Beth's Hairstyling
Blacquier's Hair Salon
Cindy Ellen's Hair Studio
Jackie for Hair
Main Street Style
River Edge Hair Salon
The Hair Centre
Lyn's User Appliances & Furniture
Chipman ValuFoods
Robert's Independent Grocery (SaveEasy)
Relief Massage Therapy
Shopper's Drug Mart – Minto
Shopper's Drug Mart – Chipman
Chipman Laundromat
Gina Bisailon/TextPlus
Doherty's General Insurance Ltd.
The Sewing Shoppe
Rick's Sharpening Service
Chase Power Products

Lillooet Consulting & Tax Services
Hometown Veterinary Hospital
H & R Block
Scotiabank
Castle Building Centre
DiCarlo's Home Hardware
Jamie's Esthetics
Karen's 4U Esthetics
Tips-N-Toes Esthetics
Cuts & Curls
Doreen's Hair Salon
Gloss Hair Lounge
Salon Aspire
Zonya Linen Restoration
Glenn's Insurance Ltd.
Sole to Soul
Best Rate Advantage Group
Denton's Bottle Exchange
Pretty Pups Dog Grooming by Amber
R & H Storage Units
The Country Vet
Grand Lake Employment Services

Science and Technology

Armstrong's Communication Ltd.
Bruce Robinson Security/Guard Services

Transportation

Brian Munroe Complete Auto Body & Detailing
Chipman Tire and Auto
Fairweather's Vehicle Inspection & Appraisals
NAPA Auto Parts Chipman
Thompson's Tire, Hydraulics & Automotive
Vernon Bishop Towing
BC Trucking & Mechanical Ltd.
Best Excavation & Trucking Ltd.
H.B. Barton Trucking Ltd.
Accurate Steering

Eric's Towing & Car Care
First Choice Auto Repair
Grand Lake Auto and Recreation
Martom Collision
Minto Auto Supplies
Steve's Auto Supplies
Swift Auto Repair
F & R Taxi

Travel and Tourism

Chipman Waterfront Campground
Chipman Museum and Tourist Centre
Pioneer Lodge & Log Cabins
Baybreeze Campground
Camp Wegesegum
Queens County Inn-Restaurant & Lounge
Grand Lake Campground
Grand Lake Park
NB Internment Camp Museum

CURRICULUM VITAE

Candidate's full name: Craig McNeill Davis

Universities attended: Dalhousie University
Bachelor of Engineering, 2014

Acadia University
Bachelor of Applied Science, 2006