Barriers to Implementing Multi-Modal Transportation Strategies in Two New Brunswick Case Studies: An Exploratory Research

by
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ABSTRACT

Barriers to Implementing Multi-Modal Transportation Strategies in Two New Brunswick Case Studies: An Exploratory Research

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Dr. Wayne Caldwell

Barriers exist when implementing Multi-Modal Transportation (MMT) strategies which may complicate or hinder the process or project. This research seeks to explore the perceived barriers in two New Brunswick case studies and to determine whether MMT is appropriate for the province. Semi-structured interviews are utilized to gather data from twelve key informants who work or advocate in relation to transportation. The research found nine themed barriers to MMT, human nature and funding being the two barriers most emphasized by informants as having a great impact against MMT strategies. MMT is perceived to be important but not applicable throughout New Brunswick. Transportation is noted as a problem in the province which requires addressing, and addressing the lack of alternatives beyond the single occupant vehicle. The research concludes that MMT is positively perceived, but transportation is an existing issue and that there are perceived barriers to implementing MMT solutions in the province.
ACKNOWLEDGEMENTS

I thank the following individuals and institutions for their contribution and help in writing this thesis. I would like to thank my advisor, Dr. Wayne Caldwell, and my advisory committee member, Dr. Ryan Gibson, both of whom provided feedback and guidance throughout the process. I would also like to acknowledge and thank the City of Fredericton Engineering and Operations Department, particularly the Engineering Services Division, who helped foster my passion for transportation planning and guided the preliminary drafting of the research question that resulted in this thesis. I would like to thank the key informants who gave their valuable time to provide the crucial data which allowed this research to take place. I would like to thank Kendrick who accompanied me through the many evenings and weekends spent working on this thesis. Lastly, I am thankful to all those who were patient and gave their valuable time to aid this research, your help does not go amiss.
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Chapter One: Introduction

1.1 Overview

This chapter will briefly explore the research topic and the role of transportation in New Brunswick (NB) and addresses related concerns and issues. There will be a brief examination of how the research problem was formed before stating the research problem, goal, and objectives.

1.2 Formation of the research problem

This research developed from the researcher’s first-hand experience acquired through an undergraduate internship which focused on creating strategies to encourage Active Transportation (AT) in the City of Fredericton (hereinafter referred to as Fredericton), NB for elementary and middle school students. Learnings from a meeting with a local advocacy group was also relevant. The objective of the project with Fredericton was to develop strategies to increase the rate of walking and cycling to school. The project focus was on infrastructure and concluded with recommendations and was allocated some funding the following year. However, throughout the project the barriers students face was made clear but the barriers the city faced in implementing strategies to increase AT or Multi-Modal Transportation (MMT) were not as well-known. This led to the question of whether communities and organizations have their own barriers when attempting to implement MMT strategies.

A meeting with a local advocacy group further emphasized the potential for the question as an appropriate topic of research. The researcher took part in a meeting that
concluded with the advocacy group finding that their strategies were not as successful as intended but it was not clear which barriers were responsible for their lack of success. Further discussion with those working in transportation in NB led to a focus on MMT due to the rates of alternative transportation (e.g. volunteer driver programs) attempting to be established within the Province. MMT has the potential to provide alternatives modes of transportation for people who are moving within and between communities, while still allowing motorized single occupant and passenger vehicles to serve as a useful option.

In 2016, the New Brunswick Medical Society (NBMS) undertook an ambitious project to improve the health of New Brunswickers through communities and the environment. NBMS engaged New Brunswickers and received 1,000 suggestions from the public regarding how communities can be healthier. The second most common theme being “better access to, and safer, active transportation.” (New Brunswick Medical Society [NBMS], 2017, p.3). This highlights that there is a desire in the community for AT, some of the modes of transportation encapsulated within MMT, yet these strategies must not only be developed but also implemented. A strategy to encourage development and implementation is proposed by NBMS who states, “the provincial posting of publicly available, transparent municipal plans which include sections on how municipalities will promote active transportation through improvements in infrastructure.” (NBMS, 2017, p.6). Even so, what barriers communities may face in executing this strategy are not well known, and the purpose of this research is to shed some light on the relevant barriers.
1.3 Research problem

There is limited understanding and research exploring the barriers communities and organizations face when attempting to implement MMT strategies. In contrast, there is more understanding and research for the barriers which prevent individuals from partaking in MMT.

1.4 Research goal

The goal of this research is to explore the barriers communities and organizations face when attempting to implement MMT strategies for the movement of individuals within and between the case study communities.

1.5 Research objectives

The following are the research objectives:

1. To explore whether key informants believe MMT is an appropriate solution for the case studies and New Brunswick as a whole;
2. To identify barriers to implementing MMT strategies; and
3. To explore whether identified barriers are similar to those identified within existing literature.

1.6 Summary

This chapter identifies the formation of the research problem through the researcher’s first-hand experience as well as documentation outlining the desire for available transportation options (such as AT) in New Brunswick. The research problem, goal, and objectives are then outlined, they are used to develop a research that seeks
to answer the questions introduced, such as whether barriers in the literature are similar to those found in this research. The following chapters will delve further into the existing literature on the topic, the methodology of gathering the data to meet the objectives and analysis of said data.
2 Chapter Two: Literature Review

2.1 Overview

In this chapter current literature on MMT will be examined. MMT will be briefly examined in its broadest form, such as definitions and how it fits in the shifting transportation paradigm. There will be a brief examination of why MMT is important and its benefits, such as efficiency, equity, health, and economy. The transportation trends in Canada, the Atlantic Provinces, and the case study areas will be introduced before focusing on the barriers and what others have found in their research regarding challenges when implementing MMT strategies (mainly focused on AT). The goal of this chapter is to highlight that MMT is an important topic to explore due to its many benefits that may be realized if the barriers are better understood. The literature parameter was geographical, and emphasis was placed on Canadian literature with some United States of America resources used. Academic journals and gray literature (e.g. municipal plans, provincial plans, secondary plans) were used in the literature review. No timeframe parameters were placed on the literature since the geographical constraint was used, however, the oldest text cited in the literature review was from 2002 – the City of Moncton Active Transportation Plan.

2.2 Defining multi-modal transportation

The definition of MMT varies depending on the community or the document being examined. Some include transit, vehicular transportation, AT (walking, biking, etc.), railways, and air travel for commuting to work (City of Mississauga, 2017) while others also include horse drawn buggies (U.S. Department of Transportation, Federal Highway
Administration [FHA], 2016). Litman (2017) uses a similar definition as the City of Mississauga with the addition of telework and delivery services. The City of Moncton (hereinafter referred to as Moncton), located in NB, defines AT as walking, cycling, rollerblading, and public transit (City of Moncton, 2002). The Town of Riverview (hereinafter referred to as Riverview), located in NB, defines AT as walking, cycling, skate boarding, wheelchair, rollerblading, snowshoeing, and cross-country skiing (Town of Riverview, 2013a). Moncton and Riverview are communities that are near to one another but are an example of how definitions vary.

For the purposes of this research MMT will use Litman’s definition since it is the most encompassing, especially since the definition used by the City of Moncton and the Town of Riverview are not quite as wide reaching as they are for AT alone. The definition of MMT for the purpose of this research is as follows: *MMT consist of diverse mobility options, including walking, cycling, automobile, public transit, etc.* (Litman, 2017) and accounts for the impacts planning, health, engineering etc. has on transportation planning. A more inclusive definition of MMT, compared to restricting to certain modes of transportation (e.g. AT and transit), allows the informants to speak broadly and may be more conducive to conversations. It should be noted that there is a larger quantity of AT literature available in comparison to MMT specific literature.

MMT has been brought to the forefront due to a paradigm shift in transportation planning resulting in changing problem definitions and solution evaluations (Litman, 2017). Prior to this shift, focus was on mobility (physical travel) and traffic conditions. The emphasis is now on accessibility (a person’s ability to reach their desired service,
location, or activity), with consideration given to a range of impacts, objectives, and options (Litman, 2017; Active Living Research, 2016). Single occupant vehicles are the ideal method for the old paradigm, but the new focus is better achieved through MMT (Litman, 2017).

Historical planning that emphasizes the vehicle has caused automobile development with large roads and ample parking for new buildings (Active Living Research, 2016). This method of planning cities creates limited options for transportation system improvements (Active Living Research, 2016). The old mentality that we can ‘built our way out of congestion’ is being replaced with an attempt to create more balanced transportation systems by not prioritizing automobiles and instead emphasizing pedestrian, public transit, and cycling (New Brunswick, Moncton, Riverview & Dieppe, 2015b). MMT strategies are often synergistic, where implementing them together rather than individually have more favourable outcomes, such as efficient parking management with a public transportation pricing reform (Litman, 2017). For this reason, it is best to examine MMT as a whole rather than as an individual subset, i.e. solely examining AT within the MMT context.

2.3 Benefits of multi-modal transportation

There are a number of benefits derived from implementing MMT within communities. Citizens are able to reap benefits, such as a healthier lifestyle and improving transportation efficiency. However, smaller communities often face barriers to MMT such as lacking a complete network to support MMT (FHA, 2016). A complete network is the provision of infrastructure and facilities that allow individuals an equitable,
safe, comfortable, and accessible means to get to their destination via the transportation mode of their choosing (FHA, 2016). Documents and policies often help support more MMT developments and create the argument for MMT at provincial and municipal levels along with the key stakeholder's involvement (Public Health Agency of Canada [PHAC], 2014), but does not guarantee the implementing of any or all strategies or projects.

There is an array of benefits that can be gained from MMT oriented development and networks. Understanding the relationship between benefits and how they differ between regions and communities is beyond the scope of this research. So too is the in-depth examination of the informants perceived benefits of MMT. Therefore, benefits of MMT are briefly mentioned in Table 1 to highlight the diversity of benefits that can potentially come if MMT is implemented.

### Table 1: Benefits of multi-modal transportation.

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Brief Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Efficiency</strong></td>
<td>Multi-modal Streets make cities more efficient by providing multiple mobility options that are safe, attractive, and convenient (National Association of City Transportation Officials [NACTO], 2016; FHA, 2016). The reallocation of space once dominated by private vehicles can increase commercial and public spaces; this more efficient use of space contributes to economic growth and a better quality of life (NACTO, 2016; Campbell &amp; Wittgens, 2004). Multi-modal Streets move more people than auto-oriented streets and help move individuals from car dependency and away from the ‘predict and provide’ planning that perpetuates vehicle ownership (Litman, 2017). MMT also emphasizes that certain modes are more efficient for certain trips, such as walking for short distances and transit for longer distances (Litman, 2017).</td>
</tr>
<tr>
<td><strong>Equity</strong></td>
<td>MMT is more equitable than vehicle-oriented streets since it recognizes diverse travel demands and how different modes of transportation play a role in an efficient and equitable transportation network (Litman, 2017; FHA, 2016). Between 20% to 40% of a population cannot or should not drive due to disability, low income, age, or other reasons; without alternative modes of transportation these individuals can become</td>
</tr>
</tbody>
</table>
Benefits
isolated or stranded (Litman, 2017). MMT increases mobility in those most likely to have transportation inequity, whether it be access to services or job opportunities (Ontario Health Communities Coalition, 2016).

Health
Around 10% of population health outcomes are attributed to the physical or built environment, while another 50% is related to social and economic determinants – this being deeply interconnected with the environment (Canadian Institute of Planners [CIP], 2013). How communities develop is important since it can positively (or negatively) influence public health through physical activity and whether active modes of transportation are utilized (Government of Canada, 2014). Health is a complex issue to address, and while MMT will not solve all the leading causes, it has the potential to have some positive impacts on individual’s lives through utilitarian physical activity (Active Living Research, 2016; Garrard, Rissel, & Bauman, 2012), reducing exposure to polluted air from automobiles and providing a connection to the natural environment (City of Moncton, 2002). MMT has some health benefits due to physical activity being derived from the mobility options of walking and cycling (Gase, Barragan, Simon, Jacks on, & Kuo, 2015; Litman, 2017). Conversely, driving is suggested to have higher associated levels of increased weight (Active Living Research, 2016).

Economic
The reduction in personal vehicle use could save some of the costs for roads and parking facilities, since AT facilities often require less space with less wear damage than what would be experienced through sole automobile use (Toronto Centre for Active Transportation [TCAT], 2012, City of Moncton, 2002; CIP, 2013). In 2006, it was estimated that in the nine largest municipalities in Canada between $2.3 and $3.7 billion was lost to congestion (TACT, 2012). It is estimated that cycling cost $0.06 per kilometer while a vehicle is $0.58 per kilometer (TCAT, 2012). There is also a cost associated with high levels of inactivity in Canada, it is estimated that it annually costs the healthcare system $5.3 billion (TCAT, 2012). In 2008, obesity was conservatively estimated to cost $4.6 billion, up 19% since 2000 (CIP, 2013).

2.4 Transportation trends
A brief examination of transportation trends in Canada, Atlantic Provinces, and the case study areas (six areas in total: Moncton, Riverview, City of Dieppe (hereinafter referred to as Dieppe), Fredericton, Rural Community of Hanwell (hereinafter referred to as Hanwell), Moncton, Port Mann Bridge, and City of Niagara Falls) indicates that there are significant differences in transportation infrastructure and usage.
as Hanwell), and the Village of New Maryland (hereinafter referred to as New Maryland), will highlight the low rates of modal-split and the high rates of vehicle use. The information provided is predominantly from Statistics Canada data on commute to work. This information is accessible to the public but will be shown in the barriers found in this research as not being adequate for understanding transportation trends and requirements for improvements. Due to not understanding how people make choices and not examining commutes taken for trips not work related. This section is to highlight current mode share and is not able to give a detailed examination of transportation trends. As part of this section, the transportation policies in the case study areas will be briefly examined.

2.4.1 Canada

Canadian planners are concern over the high rate of dependency on vehicles in Canada for residents accessing services. In a 2011 study, Barr (2011) found that vehicle dependency is the most frequent community health concern by Canadian planners (62.9%). Even with increases in cycling to work in three-quarters of Canadian census metropolitan areas (PHAC, 2014) and an increase of 4.6% for bus revenue, potentially due to increase ridership (Government of Canada, 2017), there is still a high rate of automobile use in Canada (PHAC, 2014). Intercity travel is predominantly made by car (90%) (Government of Canada, 2017). Tables 2 and 3 show a high rate (58%) of commuting within the Census Subdivision (CSD) of residence and a high rate of people driving to work (74%) (Census Canada, 2017).
There are some policies and plans in certain provinces that encourage MMT supportive environments. For example, in Ontario there is the Growth Plan under the *Places to Grow Act* (2005) and The Big Move (Metrolinx, 2008); however, policies are a complex mixture of provincial guidance and municipal implementation (Hess, 2014). Some provinces or municipalities may also lack policies and guidelines to support MMT, such as a lack of MMT provincial policy in NB since there is no found equivalent to the Growth Plan. The Transportation Association of Canada (TAC) is often the primary guide for developing streets; however, it does not encompass all settings or modes of transportation. Other documents may fill this void, such as *Global Street Design Guide* by National Association of City Transportation Officials (2016), but the documents may not always be recognized by communities or provinces.

Table 2: Canada – commuter destination.

<table>
<thead>
<tr>
<th>Commuter Destination</th>
<th>Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total – commuting destination for the employed labour force aged 15 years and over in private households with a usual place of work – 25% sample data</td>
<td>13,891,680</td>
</tr>
<tr>
<td>Commute within CSD of residence</td>
<td>58%</td>
</tr>
<tr>
<td>Commute to a different CSD within CD of residence</td>
<td>21%</td>
</tr>
<tr>
<td>Commute to a different CSD and CD within province or territory of residence</td>
<td>20%</td>
</tr>
<tr>
<td>Commute to a different province or territory</td>
<td>1%</td>
</tr>
</tbody>
</table>

Table 3: Canada – main mode of commuting to work.

<table>
<thead>
<tr>
<th>Main Mode of Commuting</th>
<th>Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total – main mode of commuting for the employed labour force aged 15 years and over in private households with a usual place of work or no fixed workplace address – 25% sample data</td>
<td>15,878,940</td>
</tr>
<tr>
<td>Car, truck, van – as a driver</td>
<td>74%</td>
</tr>
<tr>
<td>Car, truck, van – as a passenger</td>
<td>5%</td>
</tr>
<tr>
<td>Public transit</td>
<td>12%</td>
</tr>
<tr>
<td>Walked</td>
<td>6%</td>
</tr>
<tr>
<td>Bicycle</td>
<td>1%</td>
</tr>
<tr>
<td>Other method</td>
<td>1%</td>
</tr>
</tbody>
</table>


2.4.2 Atlantic provinces

In 2014, the Province of NB published the *New Brunswick’s Wellness Strategy 2014-2021* which clearly states that creating access to transportation is part of the greater strategy to meet the basic needs of everyone, so they may live with dignity, security and in good health. The current method of designing communities is not conducive to the aim of accessible transportation (New Brunswick, 2014). As of 2019, there are only five communities in NB that provide a public transit service. A report released in 2015 examined AT in NB and indicated that there was some form of interest in shifting away from car dependent communities (Hanson, Allaire, & MaEachheron, 2015). It should be noted that Local Services Districts (LSD) still exist in NB. In 1967 LSDs were created and are still serviced by the provincial government (Finn, 2008). LSDs should not be confused with incorporated areas since they do not have the same powers and are not included in this research, this will be expanded upon at a later point.
Transportation in the Atlantic Provinces will be briefly examined to provide a comparison of whether trends are similar throughout the provinces. Further information beyond transportation, such as density, population, and age can be found in Appendix A. Data presented is based on commuting to work information available through Statistics Canada but does not give a complete understanding of transportation since casual commutes, such as shopping or recreational, are not included. NB, Nova Scotia (NS), and Newfoundland and Labrador (NL) all have high rates of commuters commuting within their Census Subdivision (CSD) of residence (45%, 73% and 53% respectively), while Prince Edward Island (PEI) has the highest rate for commuters commuting to a different CSD within the Census Division (CD) of residence (51%) (Statistics Canada, 2017) (View Table 4). All four provinces have high rates of driving a vehicle to work, NB and PEI have the highest rates (84% each). Being a passenger in a vehicle, using transit, walking, or cycling are the least popular form of commuting, each of these modes being used by less than 10% each for all four provinces (Table 5).

Table 4: Atlantic provinces – commuter destination.

<table>
<thead>
<tr>
<th></th>
<th>New Brunswick</th>
<th>Nova Scotia</th>
<th>Prince Edward Island</th>
<th>Newfoundland and Labrador</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total – commuting destination for the employed</td>
<td>280,360</td>
<td>340,020</td>
<td>55,135</td>
<td>179,955</td>
</tr>
<tr>
<td>labour force aged 15 years and over in private</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>households with a usual place of work – 25%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sample data</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commute within CSD of residence</td>
<td>45%</td>
<td>73%</td>
<td>38%</td>
<td>53%</td>
</tr>
<tr>
<td></td>
<td>New Brunswick</td>
<td>Nova Scotia</td>
<td>Prince Edward Island</td>
<td>Newfoundland and Labrador</td>
</tr>
<tr>
<td>------------------------------</td>
<td>--------------</td>
<td>------------</td>
<td>----------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Commute to a different CSD within CD of residence</td>
<td>35%</td>
<td>17%</td>
<td>51%</td>
<td>40%</td>
</tr>
<tr>
<td>Commute to a different CSD and CD within province or territory of residence</td>
<td>18%</td>
<td>9%</td>
<td>9%</td>
<td>5%</td>
</tr>
<tr>
<td>Commute to a different province or territory</td>
<td>2%</td>
<td>2%</td>
<td>2%</td>
<td>2%</td>
</tr>
</tbody>
</table>


Table 5: Atlantic provinces – main mode of commuting to work.

<table>
<thead>
<tr>
<th></th>
<th>New Brunswick</th>
<th>Nova Scotia</th>
<th>Prince Edward Island</th>
<th>Newfoundland and Labrador</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total – main mode of commuting for the employed labour force aged 15 years and over in private households with a usual place of work or no fixed workplace address – 25% sample data</td>
<td>318,285</td>
<td>397,570</td>
<td>63,065</td>
<td>206,085</td>
</tr>
<tr>
<td>Car, truck, van – as a driver</td>
<td>84%</td>
<td>78%</td>
<td>84%</td>
<td>81%</td>
</tr>
<tr>
<td>Car, truck, van – as a passenger</td>
<td>8%</td>
<td>7%</td>
<td>8%</td>
<td>8%</td>
</tr>
<tr>
<td>Public transit</td>
<td>2%</td>
<td>6%</td>
<td>1%</td>
<td>3%</td>
</tr>
<tr>
<td>Walked</td>
<td>5%</td>
<td>6%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Bicycle</td>
<td>0%</td>
<td>1%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Other method</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
<td>3%</td>
</tr>
</tbody>
</table>

There is a high rate of vehicle use and a low modal split across all four provinces, with Nova Scotia fairing slightly better than other three. However, a similar trend of high vehicle use will be examined in the case studies in the research. Their inclusion criteria will be examined at a later stage.

2.4.3 Case studies

The two cases are each composed of three communities within NB. Appendix B illustrates the two case studies geographic location to each other. Case study one consists of Moncton, Riverview, and Dieppe. Appendix C illustrates the case study one community’s geographic location to each other. Case study two consist of Fredericton, Hanwell, and New Maryland. Appendix D illustrates the case study two community’s geographic location to each other. The first case study is considered a tri-community and acknowledges that residents “spend time in more than one community on a daily basis” (p.10) (Town of Riverview, 2013a). Further information beyond transportation, such as density, population and age can be found in Appendix E.

The transportation statistics for commuting to work are examined for the six communities. Some communities had examined their transportation trends, some more comprehensive than others, and the resulting data that relates to the research will be added within the section. Of the six communities, Moncton and Fredericton have a majority of commuters who remain within their CSD of residence (76% and 87% respectively). Dieppe, Hanwell and New Maryland have the majority of commuters traveling to a different CSD within the same CD (60%, 82% and 81% respectively), and Riverview has the majority of commuters traveling to a different CSD and CD (75%)
(View Table 6). Riverview’s high percentage of commuters to a different CSD and CD may be due to the Town residing in Albert County (CD) while both Moncton and Dieppe are located within the same CD of Westmoreland County. Traveling to Moncton or Dieppe, as alluded by *The Town of Riverview* (2013a) to being common, can lead to a high rate as noted in Table 6. Fredericton, Hanwell and New Maryland are all within the same CD. All communities are within their own CSD therefore, Moncton is its own CSD which is separate from Dieppe’s CSD although they share the same CD.

All six communities have high rates of vehicle use to commute to work, as high as 91% (New Maryland) and as low as 75% in Fredericton (Statistics Canada, 2017). All other modes of transportation have low rates in all six communities. The highest rate of walking is 9% in Fredericton and the lowest rate for biking is 0% in Hanwell (View Table 7).
Table 6: Case studies – commuter destination.

<table>
<thead>
<tr>
<th></th>
<th>Moncton</th>
<th>Riverview</th>
<th>Dieppe</th>
<th>Fredericton</th>
<th>Hanwell</th>
<th>New Maryland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total – Commuting destination for the employed labour force aged 15 years and over in private households with a usual place of work – 25% sample data</td>
<td>30,805</td>
<td>8,495</td>
<td>11,375</td>
<td>24,660</td>
<td>2,085</td>
<td>1,795</td>
</tr>
<tr>
<td>Commute within CSD of residence</td>
<td>76%</td>
<td>23%</td>
<td>34%</td>
<td>87%</td>
<td>9%</td>
<td>5%</td>
</tr>
<tr>
<td>Commute to a different CSD within CD of residence</td>
<td>17%</td>
<td>1%</td>
<td>60%</td>
<td>4%</td>
<td>82%</td>
<td>81%</td>
</tr>
<tr>
<td>Commute to a different CSD and CD within province or territory of residence</td>
<td>5%</td>
<td>75%</td>
<td>4%</td>
<td>7%</td>
<td>7%</td>
<td>13%</td>
</tr>
<tr>
<td>Commute to a different province or territory</td>
<td>1%</td>
<td>2%</td>
<td>2%</td>
<td>1%</td>
<td>2%</td>
<td>1%</td>
</tr>
</tbody>
</table>

Table 7: Case studies – main mode of commuting to work.

<table>
<thead>
<tr>
<th></th>
<th>Moncton</th>
<th>Riverview</th>
<th>Dieppe</th>
<th>Fredericton</th>
<th>Hanwell</th>
<th>New Maryland</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total – Main mode of commuting for the employed labour force aged 15 years and over in private households with a usual place of work or no fixed workplace address – 25% sample data</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Car, truck, van – as a driver</strong></td>
<td>76%</td>
<td>82%</td>
<td>84%</td>
<td>75%</td>
<td>87%</td>
<td>91%</td>
</tr>
<tr>
<td><strong>Car, truck, van – as a passenger</strong></td>
<td>9%</td>
<td>11%</td>
<td>8%</td>
<td>8%</td>
<td>10%</td>
<td>7%</td>
</tr>
<tr>
<td><strong>Public transit</strong></td>
<td>5%</td>
<td>2%</td>
<td>3%</td>
<td>4%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Walked</strong></td>
<td>8%</td>
<td>4%</td>
<td>3%</td>
<td>9%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Bicycle</strong></td>
<td>1%</td>
<td>0%</td>
<td>1%</td>
<td>1%</td>
<td>0%</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Other method</strong></td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
</tr>
</tbody>
</table>

Additional data was collected for case study one by the tri-community (case study one) hiring a consultant who wrote the technical report to inform and guide the *Destination 2040: Regional Sustainable Transportation Master Plan* (New Brunswick et al., 2015a). The technical report examined Moncton Census Metropolitan Area (CMA) and the data provided (as shown in table 8) allow for data to be extrapolated to inform the case studies since Moncton, Dieppe, and Riverview were a core focus. Most households in Moncton CMA own at least one vehicle (40% owning one vehicle and 37% owning two vehicles) (New Brunswick et al., 2015a). The median trip distance for residents living in the municipalities in case study one is 4.9km, up from 4.6km in 2006.

Most residents did their daily trips within their own communities, but Dieppe and Riverview both have Moncton as close seconds for daily trip destinations, 43% and 36% respectively (View Table 8). The most popular mode of transportation for different trip distances varied, as can be seen in Table 9. Motorized modes are popular for 1 to 10+ km, while non-motorized modes have higher rate of use according to trip distance. Walking is the most popular for very short trips (0-1km), bicycle is most common for 1-3km trips and transit is similar to motorized modes, being popular for 1 to 10km trips.
Table 8: Case study one – daily trips.

<table>
<thead>
<tr>
<th>Departure</th>
<th>Moncton</th>
<th>Dieppe</th>
<th>Riverview</th>
<th>Outside CMA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moncton</td>
<td>76%</td>
<td>12%</td>
<td>6%</td>
<td>6%</td>
<td>209,374</td>
</tr>
<tr>
<td>Dieppe</td>
<td>43%</td>
<td>47%</td>
<td>4%</td>
<td>6%</td>
<td>58,854</td>
</tr>
<tr>
<td>Riverview</td>
<td>36%</td>
<td>5%</td>
<td>51%</td>
<td>8%</td>
<td>36,972</td>
</tr>
<tr>
<td>Outside CMA</td>
<td>42%</td>
<td>15%</td>
<td>8%</td>
<td>35%</td>
<td>29,534</td>
</tr>
</tbody>
</table>


Table 9: Case study one – motorized and non-motorized modes trip length.

<table>
<thead>
<tr>
<th></th>
<th>0-1km</th>
<th>1-3km</th>
<th>3-5km</th>
<th>5-10km</th>
<th>10+km</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Motorized</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auto (Driver)</td>
<td>8%</td>
<td>25%</td>
<td>20%</td>
<td>25%</td>
<td>22%</td>
</tr>
<tr>
<td>Auto (Passenger)</td>
<td>9%</td>
<td>26%</td>
<td>19%</td>
<td>26%</td>
<td>20%</td>
</tr>
<tr>
<td><em>Other Modes</em></td>
<td>1%</td>
<td>26%</td>
<td>24%</td>
<td>28%</td>
<td>20%</td>
</tr>
<tr>
<td><strong>Non-motorized modes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transit</td>
<td>1%</td>
<td>30%</td>
<td>35%</td>
<td>33%</td>
<td>N/A</td>
</tr>
<tr>
<td>Bicycle</td>
<td>13%</td>
<td>60%</td>
<td>1%</td>
<td>26%</td>
<td>N/A</td>
</tr>
<tr>
<td>Walking</td>
<td>45%</td>
<td>38%</td>
<td>8%</td>
<td>9%</td>
<td>N/A</td>
</tr>
</tbody>
</table>


*Other motorized modes include school bus, other bus/shuttle and taxi

Case study two has transportation data specific to cycling and transit use collected during the development of the *City of Fredericton Active Transportation Connectivity Plan* (2017) and the *Transit Strategic Plan* (2018). The data is focused on the City of Fredericton unlike the previous transportation data for case study one that examined the three communities and beyond.
For cycling there is a high level of survey participants who cycle three times a week or more (62%) and cycle 5 to 6 months out of the year (37%) of the 498 responses (City of Fredericton, 2017). There is a preference for bike-only infrastructure, 60% saying they are comfortable cycling in traffic but prefer dedicated infrastructure. Most (61.3%) cycle for both recreation and getting to work/school and for an errand (City of Fredericton, 2017). Gaps in the existing transportation network is the most common (19.8%) priority (City of Fredericton, 2017).

For transit use, the main themes that need addressing are: affordability, accessibility, scheduling, and travel time. As of this research, transit is not provided on Sundays which 60% agree should change to have services available throughout the week (City of Fredericton, 2018). Transit inconvenience is the most often cited reason (76%) to not take transit, as will be highlighted in the research findings (City of Fredericton, 2018). Overall, all six communities have high rates of vehicle use, New Maryland and Hanwell are the only two communities with no transit service and the least modal-split.

2.4.4 Case studies: transportation policies

Case study one (Moncton, Dieppe, and Riverview) is the only communities that are known to have a plan that has more of a regional perspective on transportation and that focuses on communities beyond an individual one. The Destination 2040: Regional Sustainable Transportation Master Plan’s (2015a) focus is to be a strategy “for the development of multi-modal transportation system that provides the infrastructure
necessary for residents to choose their preferred mode of transportation including driving, using public transit, walking, or cycling” (p.172) (City of Moncton, 2014).

Transportation plans for case study two (Fredericton, New Maryland, and Hanwell) focus on either the automobile or on AT, but not combining the two nor looking at MMT. Growth boundaries and more Transit-Oriented Development is a common theme in all plans except for Hanwell, and New Maryland mentions growth boundaries but not Transit-Oriented Development (Town of Riverview, 2013b; City of Moncton, 2014; City of Dieppe, 2018; City of Fredericton, 2007; Village of New Maryland, 2016). Although the goal is to increase density for future development, Riverview acknowledges that automobile use will remain the primary method of transportation even though they participated in The Destination 2040 project. The continued reliance on the automobile could potentially be an attestation that there is no demand to shift to another primary mode of transportation since Riverview does not face any major circulation problems (Town of Riverview, 2013b).

The City of Fredericton acknowledges the high rates of automobile use but would like for residents to be able to use other modes of transportation, such as transit (City of Fredericton, 2007). Emphasis is placed on the old train tracks that have been converted into multi-use trails, as well as education for both cyclists and motorists. At the time of this research, the City of Fredericton is still in the process of developing their updated Municipal Plan. New Maryland and Hanwell both mention AT and connecting subdivisions; however, there is no further elaboration other than those guiding principles and the focus of AT for leisure use (Hanwell, 2016; Village of New Maryland, 2016).
Overall, the communities examined for this research have high rates of vehicle use and low rates of modal-split. One barrier some participants alluded to as being a reason why those living in Fredericton are not using transit is inconvenience. How the city plans to address this barrier is not mentioned. There is also mention of density and five of the six communities are attempting to increase it, this too will be discussed in the barriers found in the research. The low modal-split is alluded to be caused by density and inconvenience; however, this requires further examination whether these are real or perceived barriers, which this research will explore.

2.5 Barriers to implementing multi-modal transportation strategies

The researcher is unable to find a large quantity of literature examining the barriers to implementing MMT strategies, due to a larger focus being on why community members are not participating in MMT and the barriers they face, as well as focusing on the benefits of MMT rather than its implementation. Of the literature on barriers, the focus is predominantly placed on AT, and Toronto research conducted by Hess (2014). Hess (2014) conducted a study in Ontario and required further research and exploration for whether similar barriers are pertinent in MMT for other provinces. However, it does begin to create a base of knowledge of what barriers currently exist. The barriers present in the literature will be introduced in the following sections. These barriers include built environment, intergovernmental work and interdepartmental, and funding. The barriers specific to rural communities will also be introduced. Some of these barriers are found in both rural and urban settings.
Since Hess’ (2014) research focuses on communities much larger than the case studies. This research may shed light on barriers that may be present in communities smaller than Hess’ examination of the Greater Toronto Area and Hamilton Area but still larger than rural areas examined by FHA (2016). Most of the research highlights barriers that exist in large cities and rural communities which provides support for barriers potentially existing in the case studies. However, there lacks a depth of understanding due to a lack of research examining cities that are similar in size to the case studies. An entire middle ground of medium size communities is lacking examination for their barriers to implementing MMT strategies. To give perspective of how large or small the case studies are, the following applies. According to Statistics Canada (2011a) medium population centres are a population between 30,000 and 99,999 – Moncton and Fredericton both falling within this definition, other communities falling in the lower bracket of 1,000 to 29,999 population for small population centres.

2.5.1 Built environment and infrastructure barriers

The built environment and infrastructure can act as a barrier for those making decisions about whether they want to participate in MMT. The built environment includes many environments such as workplaces, schools, neighbourhoods, connectivity, transportation system, and walking and cycling infrastructure (Hanson et al., 2015). A lack of safety in proper infrastructure can become a concern for those in the community, and they may choose to not use MMT. Safety concerns can be a large deterrent for the uptake of active modes of transportation, such as cycling (Active Living Research, 2016).
Built environment that has a low residential density is aversive to public transit (Statistics Canada, 2011b; New Brunswick, Moncton, Riverview, & Dieppe, 2015b). Higher density allows for more users within a smaller area, while lower density has longer commutes due to greater distances and infrequent transit services. This increases commuting time due to required transfers and schedules that are not synchronized (Statistics Canada, 2011b; Clark & Scott, 2015). It is said that transit is best supported when environments are built following the five D’s: Density, Diversity, Design, Destination, and Distance (Active Living Research, 2016).

The inequitable system may also open or close the door to other modes of transportation. Wider roads with higher traffic speeds increases automobile access while degrading access for pedestrians and cyclists (Litman, 2017; Active Living Research, 2016; CIP, 2013). Lack of sidewalks, crosswalks, bikeways, and connectivity for all modes of transportation are all barriers for AT and transit use (Active Living Research, 2016; Barr, 2011; FHA, 2016). Trade-offs occur when making decisions about infrastructure upgrades and prioritizing one mode of transportation over others due to there being only so much space within existing communities. Road space is a trade-off that must often be dealt with since there is only a certain amount of right-of-way to allocate space for sidewalks, bike lanes, bus lanes, general traffic lanes, and parking lanes – it is not often that all can fit (Litman, 2017). These are situations where trade-offs can complicate a community’s ability to integrate an MMT networks and its associated emphasis on accessibility (Litman, 2017).
Not all barriers can be blamed on development since car culture is an existing barrier. Lindau et al. (2014) suspect that there is prejudice against Bus Rapid Transit (BRT) due to a multitude of factors such as owners and riders of private vehicles rallying for better spaces for their vehicles, but seldomly supporting better sidewalks or transit lanes. When projects are proposed, such as BRT, the media is enthused to cover it in larger cities but rarely have the expertise of what is the most efficient mode of transportation and instead rely on experts, and the public that are enthusiastic and at times radically oppose or support the project (Lindau et al., 2014).

Community participation is lacking when it comes to large scale projects where developing cities “stand between inform and consult” (p.11) their public (Lindau et al., 2014). The social willingness to purchase a house which requires driving to work, school, and shopping while being reluctant or creating the inability to use AT and public transit may perpetuate developments that are not MMT friendly (CIP, 2013). In urban settings, a fringe highway can provide automobile access but not walking, cycling, or public transit access. In comparative settings, some urban centers may be more accessible for those walking, cycling, or using transit and less so for motor vehicles (Litman, 2017). Furthermore, public perceptions, advocacy groups, socio-demographics, local geography, and weather conditions can support or hinder MMT (PHAC, 2014). It is noted that land use and transportation impact each other, meaning that a number of sectors must work together for a cohesive and supportive network (Hanson et al., 2015).
2.5.2 Different needs micro-level barriers

A barrier to implementing strategies to increase MMT is the sheer diversity found in the micro-barrier’s that individuals face. Clark and Scott (2015) examined the barriers individuals face when attempting to partake in walking to work. Individuals noted distance being a deterrent to walking, others simply did not make the time. Barriers change with socio-demographic variables, such as age. Young adults say distance is a factor and that they walk enough while seniors note poor lighting, too much traffic and dangerous road crossing, no one to walk with, and not liking to walk as their reasons (Clark & Scott, 2015).

Just as there are micro-level barriers that impact individuals differently and vary across individuals, so too are barriers faced by communities. There exist barriers in rural communities that would not be successfully addressed using urban strategies (as will be examined later), but there also exist the problem that sometimes universal solutions do not exist (Miller & Soberman, 2003). This is a barrier at the provincial and federal level because said strategy is not universally applicable (Miller & Soberman, 2003), and may result in an inadequate strategy or no strategy at all if an overarching complete solution is desired to address the problem(s) of MMT strategies or the individual level barriers.

2.5.3 Intergovernmental and interdepartmental barriers

Barriers can arise when responsibilities overlap, such as municipalities and provincial responsibilities differ but they do provide services, be it social or infrastructure based (Finn, 2008). Finn (2008) recommends that areas with shared responsibilities be
kept to a minimum while still recognizing that tasks will rarely fall entirely in one division. Lindau, Hidalgo, and de Almeido Lodo (2014) found that overlapping responsibilities is a barrier to BRT but also that departments tend to work in isolation from one another.

There are barriers in intergovernmental and interdepartmental areas beyond modern public governance, such as the departments and fields of work related directly or indirectly to transportation. Transportation is complex which can pose a barrier due to it reaching beyond civil engineering, such as transportation planning impacted by land use (Litman, 2017). Involving planners in transportation impacts is important (Litman, 2017; New Brunswick et al., 2015b) but may not always happen. Because of MMT’s connection with health benefits, it can be said that the health field should also be engaged in transportation (Garrard, Rissel, & Bauman, 2012); however, this interwoven nature can become its own barrier when making decisions if so many stakeholders are involved (Active Living Research, 2016), especially if there is dysfunction or lack of collaboration. Hanson et al. (2015) found that intergovernmental, interdepartmental, or organizational silos are a factor when implementing AT strategies in NB communities.

The Public Health Agency of Canada (PHAC) (2014) and Hess (2014) both note that there are conflicting goals and a lack of coordination between provincial transportation departments and municipal governments. The lack of awareness, coordination, and collaboration extends within and between a variety of governments (federal, provincial, regional, and local) (PHAC, 2014). This includes coordination for allocation of costs and design standards as well as coordination between Regional and lower-tier municipalities, and between municipalities and the Ministry of Transportation.
Municipalities find that MTO makes it difficult to incorporate AT, especially where local and provincial facilities intersect since MTO standards have jurisdiction (Hess, 2014).

When groups do work together, they face the barrier of a group or organization holding a strong opinion of what is ‘correct’ and resist any change. Strong opinions and being inflexible can create a barrier when attempting change and decision-making (Miller & Soberman, 2003). When attempting to make the ‘best’ decision on a problem, the issue often becomes political as it attempts to balance the trade-offs that are involved in such an important decision. The process becomes inefficient and complicated with the strong opinionated groups, such as NIMBY (Not In My Back Yard), single-issue groups (regardless of whether the issue relates to them), those who see development as us-against-them, lobbyists, or groups with narrow and self-vested interest (Miller & Soberman, 2003) or hidden agendas (Lindau et al., 2014). These strong opinionated groups can create a barrier towards reaching a final decision. At times a lack of commitment to BRT (or MMT) by city administrators can be a barrier (Lindau et al., 2014).

Further challenges for MMT are the typical factors considered when making decisions, and failure to consider all factors can often improve one mode of transportation while reducing the accessibility for other modes (Litman, 2017). The factors often forgotten includes the quality of other modes, such as speed, convenience, comfort, safety and affordability. Public transit speed is often considered but not comfort, while walking and cycling access is often not considered at all (Litman, 2017).
Emphasized by the transport network, connectivity may fail when only regional roads and transit networks are considered but local streets, sidewalks, paths, and intermodal connections (key for multi-modal success) are ignored (Litman, 2017).

As previously mentioned, MMT provides mobility equity but is undermined when conventional transportation evaluations do not consider: mobility for non-drivers, improving public fitness and health, or strategic planning objectives (Litman, 2017). These are the consequences of transportation improvements hyper focusing on one mode instead of an interwoven multi-modal network. More benefits can be achieved when all modes of transportation are considered when planning. When Transportation Demand Management and Smart Growth Strategies, are utilized it creates a more holistic transportation focus in comparison to exclusive roadway expansion or efficient and alternative fuel vehicles (such as Autonomous Vehicles) which only focus on one or two problems without looking at indirect wins (Litman, 2017; Kimbley, 2017).

2.5.4 Institutionalized barriers

Hess (2014) found that institutionalized processes are barriers towards implementing AT policies. Institutionalized barriers are reflected in the institutional decision-making processes. Hanson et al. (2015) found that municipal staff play a large role in AT initiatives in NB; therefore, municipalities without staff or overtaxed staff can create a barrier to integrating or developing MMT strategies. Hanson et al. (2015) also note that the gap in responsibilities for AT infrastructure provincially (and therefore also MMT in certain situations) between urban and rural areas is also a barrier that should be addressed to facilitate more AT opportunities. In some instances, municipalities take
ownership of AT infrastructure in urban areas. Rural areas do not always have the ability to take ownership and the governing body does not implement AT infrastructure to the rural area’s satisfaction. Regardless of individual movement of people between places these municipalities work independently from one another, this barrier resulting in unmatched facilities or no inter-municipal staff collaboration (Miller & Soberman, 2003).

Hess (2014) found that policy frameworks generally support AT but have not widely adopted ‘complete streets’ language that supports other modes involved in MMT. Institutionalized barriers are also felt in the performance measures used by engineers and planners (Hess, 2014). It is found that the Municipal Class Environment Assessment, Levels of Service, and Traffic (or Transportation) Impact Studies have an important role in roadway performance measurement and therefore impact roadway designs (Hess, 2014). These guides and performance measures are part of the barriers for Complete Streets and a Multi-modal Network since they provide streets that are designed primarily for motor vehicles (Hess, 2014). When a big project is implemented staff can be occupied with the quotidian tasks while blueprints that may not have been finalized are implemented by road builders, the resulting outcome may not fulfill its potential (Lindau et al., 2014).

2.5.5 Standards and design guidelines barriers

A barrier that Hess (2014) notes is the influence street and roadway design guidelines have on AT and MMT. There is some confusion and inconsistency regarding the use of term ‘standard’ versus ‘guideline’. The idea of standard design requirements
has shifted to an emphasis of more design discretions being based on local conditions (Hess, 2014). Yet, the legal ramifications are why design guidelines are still taken extremely seriously. Since engineers and municipalities can be held legally liable for unsafe designs, guidelines that feature guidance for such things as lane widths, turning radii, and sight lines are still upheld even if they encourage safety for motorists but ignore other road users (Hess, 2014).

The main engineering groups in Canada are the Transportation Association of Canada (TAC) and the Canadian Institute of Transportation Research Board (Hess, 2014). However, their design guides do not always encompass everything or all road users and can take a long time to update. For example, TAC recently updated their 1999 design guide, after nearly 17 years (Hess, 2014).

2.5.6 Policy and innovation barriers

Policies have the ability to encourage walking and cycling as forms of transportation (Active Living Research, 2016), but they also have the ability to cause barriers for MMT if they favour automobiles (Lindau et al., 2014). In the United States of America, the federal government allows a deduction of up to $250 for car parking, while only $130 for purchasing transit/commuter tickets (Active Living Research, 2016). Miller and Soberman (2003) found that in Ontario land use and transportation policies favour low-density and auto-oriented development through property taxes and federal taxes deductions for automobiles. These policies skew an individual's decision away from MMT and create barriers to MMT access.
Similar to health, MMT oriented policies are not the only solution to a complex issue since an individual’s decision to walk or cycle is impacted by their personal needs, preferences and attitudes along with the complex mix of physical and social environments (Active Living Research, 2016). Policies can help create convenient, safe, and connected walking and cycling infrastructure, all of which are at the core of promoting active travels and MMT (Active Living Research, 2016). When promoting AT, it is found that a standardized or uniform strategy is less effective than more diversified initiatives which target specific groups (CIP, 2013). Recognizing that there are specific groups, instead of considering blanket approaches may encourage further MMT or AT policies.

To achieve successful policies and outcomes all levels of government require champions. This can be a challenge or a barrier if transportation policy and guidelines are not currently within the government or champions mandate (Lindau et al., 2014; Active Living Research, 2016). If a project cannot be implemented within a political cycle it risks being halted by the opposing political party if they are elected (Lindau et al., 2014). Public Health Agency of Canada (2014) conducted research in which stakeholders noted that the degree governments are involved in AT is often reflective in the personal involvement of senior management as well as elected officials, these individuals acting as champions.

Without champions MMT strategies may not be pushed forward and implemented. Politicians who are reluctant to innovate can also be a barrier, which maybe come evident when services fail to meet changing demands (Miller & Soberman, 2014).
It takes a lot of leadership and risk-taking by politicians when attempting to move away from land use and transportation trends that are not working, but are the status quo (Miller & Soberman, 2003). There is also apprehension among developers to deviate from the typical neighbourhood development, seen through a reluctance to include elements from pedestrian and transit-friendly neighbourhoods such as mixed-use and ‘effective’ density approaches (Miller & Soberman, 2003).

2.5.7 Funding barriers

Funding and costs regarding implementing AT projects are a barrier for municipal AT plans (Hess, 2014) and BRT projects (Lindau et al., 2014), as well as for smaller communities with lower tax bases and less staff (Hanson et al., 2015). It requires money to invest in both the transportation system and built environment, money which is often in competition for public health and education demands (Miller & Soberman, 2003). Hess (2014) found that AT projects are usually bundled with larger projects to minimize total costs. If AT infrastructure funding is not built into the capital planning process the facility will not be included in the road project (Hess, 2014). Even when there is public support or supportive policies there may not be funding for the AT facility if councillors see it as an extra cost; especially if there is no solid evidence regarding how the additional facility will increase AT use. Municipalities often do not have the tools or resources to provide evidence that is difficult or impossible to establish (Hess, 2014).

How Return On Investment (ROI) is evaluated can be a barrier to MMT strategies. Cost-benefit analysis is complex and often omits environment and social impacts, the focus being on direct monetary values (New Brunswick et al., 2015b).
Sustainable ROI is a new, more holistic approach to calculating the cost but if the old system prevails, it will continue to favour status quo plans.

According to Finn (2008), a local government requires a geographic, demographic, and financial base to allow for its responsibilities to provide effective service organization and delivery. This requires the services to be funded largely through its own tax capacity (Finn, 2008), however, difficulty may arise if there is a small tax base. Finn (2008) argues that a dependence on another level of government for sufficient funding risks compromising its autonomy and independence. There is acknowledgement that there are times where transfers must occur, either conditional or unconditional. The conditional transfers are those which Finn (2008) warns against since they “have the greatest potential to distort local priorities” (p.15). The warning against certain kinds of funding can be a barrier for some communities if their tax base is not large enough and may have to forgo certain infrastructure improvements due to its conditional funding. A community must also be able to absorb an increase in demand for when a new or improved service is required – not something those with a small tax base may easily do.

2.5.8 Evidence and academic barriers

A barrier noted in the literature review is the absence of data (e.g. travel behaviour) and knowledge (e.g. best practices) (PHAC, 2014). There is a need for national and provincial-level data that is statistically dependable, comparable across jurisdictions, and traceable over time (PHAC, 2014). Hansen et al. (2015a) states that more empirical research is needed to build an evidence-base for the relation between
the built environment and rural communities and active living and obesity. There is a lack of economic analysis that can be used as a business case for AT and MMT investment, which also needs to be understood by elected officials and key stakeholders (PHAC, 2014). There is a lack of measuring and documenting the outcomes of specific initiatives as well as lessons learned from case studies that can be used to disseminate learnings (PHAC, 2014). Lindau et al (2014) found that when BRT projects are proposed there is a lack of acknowledging safety risks involved and a certified traffic safety auditor is not sought to approve the blueprint even though transit overall has a lower traffic casualty rate.

2.5.8.1 Urban solutions barriers

Sometimes, when information does exist it may not be applicable to some communities, such as saturation of urban solutions which may have little importance to rural communities struggling with similar problems, but requiring vastly different solutions (Hanson et al., 2015). Addressing obesity and the lack of physical activity due to infrastructure and the built environment have been prominent in urban and suburban areas (Hansen et al., 2015). They have resulted in improvements in infrastructures such as sidewalks, bike lanes, parks and playgrounds, and mixed-use urban design – all this emphasizing AT and recreation to decrease obesity.

However, many of these improvements are not appropriate for rural and remote areas, especially downtown or commercial centres (Hansen et al., 2015). There is some research and development undergoing in rural communities but the evidence is still underdeveloped when compared to urban and suburban counterparts (Hansen et al.,
Hansen et al. (2015) give an example of how urban solutions can be adjusted to be more appropriate for less dense areas, such as having school buses drop children off at a location where they can walk or bike with their peers for part of the distance. These programs may be creative and give solutions to rural problems, but they are often faced with their own barriers or liability and safety concerns (Hansen et al., 2015).

Rural communities have differing definitions, for example, someone using a bicycle could be assumed to be doing so because their driver’s license is revoked – an assumption that may not be the same in urban communities (Hansen et al., 2015). Unlike urban areas, regular AT is an unrealistic expectation for many due to distances between destinations, home, work, and school (Hansen et al., 2015). An emphasis must be placed on land use, where development occurs, and affordable recreational opportunities through the built environment, natural environment, programs, and policies (Hansen et al., 2015).

2.6 Summary

This literature review focused on exploring the benefits and barriers of MMT. MMT is important due to it supporting the paradigm shift that emphasizes modal-split. Some benefits that were examined are road/street efficiency, equity, health, social, community, environmental, and economic impacts. A brief look at transportation in Canada shows that there are measures in place to encourage MMT and that there is an uptake of cycling and transit use. However, vehicle use is still prominent. A high rate of vehicle use is also seen in Atlantic Provinces as well as the case study areas used in
the research. There is very little modal-split with some communities having as little as 1% of residents partaking in walking as their commute to work.

Understanding the barriers to MMT may help in increasing modal-split and increasing the chances for the community to reap the benefits of MMT. There is little literature examining the barriers to implementing MMT strategies, most focusing on AT in urban and suburban settings. The barriers that are mentioned regarding AT are the built environment, infrastructure, intergovernmental, institutional, standards and design guidelines, policies, funding, evidence and research, and urban solutions.

As evident in the literature review, some barriers cross themes, such as liability being barriers for policies and urban solutions. This indicates to the complexity which exist in identifying and addressing implementation barriers since they are not black and white or contained in a single theme. This research focuses on adding to the sparse literature that was examined and whether MMT is perceived as appropriate in NB. Before examining the findings, the methodology for collecting the data is introduced.
3 Chapter Three: Methodology

3.1 Overview

Qualitative data is used in this research, and this chapter will examine the case studies, data collection, key informant interviews, identifying and contact of key informants, semi-structured interviews, and data analysis. The use of qualitative data and case studies is not to create generalization, instead, the goal is intrinsic in the way that the goal is to encapsulate complex meaning about barriers to MMT so others may “experience these happenings vicariously and draw their own conclusions” (Stake, 2015, p450).

3.2 Selection of case studies

This research uses exploratory multiple case-study analysis of NB communities to aid in the identification of key informants to interview which resulted in the collection of data that is analysed. Two case studies are used in the research to narrow the focus from provincial to more localized areas to aid informants to speak to the topic being explored. The two case studies are both composed of three communities, all communities being located within NB and have potential for inter- and intra-community movement. Case studies are identified using the following criteria:

1. the case study must be municipalities within the same CMA or Census agglomeration (CA) where;
   a. three communities have directly abutting boarders, and
b. at least one municipality has a population centre (as per CMA/CA requirement);

2. there is potential for movement between and within CMA or CA;
   a. evident through travel patterns, or
   b. the community population centre being within 10 kilometers from each community boarders.

The resulting case studies from the inclusion criteria includes case study one composed of a tri-community (Moncton, Riverview, and Dieppe) and case study two composed of three communities (Fredericton, Hanwell, and New Maryland). A distinction between the tri-community and the second case study is that the tri-community collaborated to create Destination 2040: Regional Sustainable Transportation Master Plan (New Brunswick, Moncton, Riverview, & Dieppe, 2015a) a report for how the three communities can work together regarding transportation. Case study two has no similar report, nor is a similar report found within NB. A brief examination of the case study transportation trends can be seen in the previous chapter. Of the possible case studies, Saint John, Rothesay and Grand Bay-Westfield could have been included in the research. It was excluded to ensure a manageable research scope and the researcher had a lower familiarity with the communities in comparison to the two chosen case studies which would strengthen the research.

3.3 Contact with informants

Informants were contacted based on their perceived relevance to the topic due to their work or their involvement in fields related to the research topic (e.g. advocacy,
academic work, civil engineer) and/or location (e.g. working in one of the case study communities). The case studies make sure that these individuals, based on the area of their work and/or their location, will be more inclined to be aware of MMT because of its potential in commuting within the case study communities. As well as their personal or professional interaction with transportation in the case studies.

At the end of each interview snowball sampling is used to further ensure that those who are knowledgeable of the research topic are approached to participate. Snowball sampling is a research approach where “the researcher identifies a small number of subjects, who, in turn, identify others in the population” (Gray, 2014). Initial informants were identified through their publications, or their professional employment in a field pertaining to MMT (e.g. municipal engineering, public transportation departments, public health). New participants are included in the research until repeated information begins to be collected. Each informant is contacted via email and provided with a letter of invitation (View Appendix F) and a consent form (View Appendix G) which is signed and returned to the researcher on the day of the interview, the informant being given a copy of the consent form for their records.

Key informant interviews are utilized in this research since it allows the researcher to establish a rapport with the individual being interviewed and clarify any questions they may have (Gray, 2014). This occurred by clarifying the definition of MMT since there can be confusion with MMT used when moving commercial goods due to similar terminology. As well as clarifying any points the informant may make but not explain in detail. This ability to nudge informants allowed for richer data to be collected
without having to conduct follow-ups (Gray, 2014). Lastly, key informant interviews allow the researcher to spread awareness of MMT in the province and enthusiasm for modes of transportation not necessarily utilized by many in the population.

### 3.4 Data collection

The qualitative data is collected through audio recordings of 12 in-person semi-structured interviews over the span of three weeks in November 2017, with interviews lasting between 40 to 120 minutes. Each interview is conducted in-person at a location the informant chose. An interview guide (View Appendix H) is used to facilitate and generate conversation on the topic being researched. Questions beyond the interview guide (e.g. how do you mean? What barriers did your project face?) are used to further conversation on specific topics. Acting only as a guide, at times the interview guide is omitted so that the informants can freely speak on the barriers they perceive are most pertinent, but the guide is used to bring wondering discussions back to the research topic. Notes are taken during the interview, so that mentioned barriers can be discussed and expanded upon by the informant if they do not expand upon them when first mentioned. The resulting audio recordings are transcribed verbatim (except for locations and names which are removed) and validated by the researcher listening to the recordings multiple times.

### 3.5 Data analysis

Data is analyzed using NVivo and thematic analysis. Each interview is read in its entirety before being divided into codes, previous research informed some of the codes
used (e.g. funding); however, codes are constructed as required to best represent the data. These codes are condensed into themes which subsequently either support, contradict, or add to the themes previously found in the literature, as introduced in chapter two.

3.6 Ethics consideration

Ethics for the research was granted by the Research Ethics Boards on September 25th, 2017 (REB #17-06-029) and subsequently renewed at the annual mark.

3.7 Summary

This chapter introduces why case studies are used to inform who is interviewed and also contains the research to specific areas for manageability. The criterion for case study inclusion into the research is introduced as well as introducing the two case studies, each composed of three NB communities. Regarding the research, the qualitative methodology is introduced as well as the guiding questions for the semi-structured interviews. Audio recordings of the in-person interviews is the data collected, transcribed and analysed using NVivo and thematic analysis. The resulting codes are informed by the literature review and constructed as required. The codes are then condensed into themes to support, contradict, or add to the themes found in the existing literature. Overall, the chapter introduces the case studies which informed the methodology used to gather and analyse data.
4 Chapter Four: Results and Discussion

4.1 Overview

This chapter will explore the barriers that informants have noted regarding the implementation of MMT strategies in the case studies, as well as whether informants perceive MMT as an appropriate strategy in NB. The interviews that are used to collect data will be referenced and analysed in this section, quotes will also be included; however, names have been changed to maintain confidentiality. This chapter examines the broader NB provincial context regarding transportation. As made evident by the informants, it is hard to distinguish urban and rural areas when speaking about transportation due to the transient nature of NB and commuting. Elizabeth explains this blurred divide in her statement:

… the rural and urban, I think that divide is pretty blurry, if you drive five minutes past New Maryland you're in – it feels very rural, even if you go to the back of some subdivisions it feels pretty rural. So, we're not too far from the rural in the urbans and I think a lot of the people who live in rural areas go to urban centres to work… really figuring out that we're in this one thing, it's not this great division in New Brunswick.

The division between urban-rural being blurred and thin can potentially lend itself to how informants speak of the case studies as well as NB as a whole. This is the case in the project Elizabeth was involved with, the project included an advisory committee working together on health and transportation issues. They found that although “we
originally had two mandates, a rural mandate and an urban mandate, but then, after our first meeting everyone was like. ‘we’re too close it doesn’t make sense to have two different systems, why don’t we have one system that works well for everybody.’” (Elizabeth).

This mindset has potentially taken away from the case studies since the focus is on the larger NB setting that does have differences (e.g. LSDs), but it does not distract from the greater barriers faced by those interviewed; instead it allows more to be added to understand how individuals perceive transportation and communities in NB and the associated barriers to implementing MMT strategies. The barriers that derive from the interviews and which will be examined in further detail in this chapter are: priorities, policies, intergovernmental and interdepartmental, funding, human nature, time and complexity, physical realities of today, lack of knowledge and awareness, and unexpected barriers. Some of the barriers noted by the informants are also found in the literature. The appropriateness of MMT in NB will be examined before exploring the barriers to ensure that there is a need or desire for MMT.

4.2 Interview responses coded in nine major themes

Twelve interviews were conducted and from this data there are 42 codes, those codes are coded while analyzing the data. These codes are then collapsed into nine themes, and they are informed by the existing literature. These themes will be explored in this chapter. The breakdown of the codes and themes can be found in Appendix I and a summary of the themes can be found in Appendix J.
4.3 Compare and contrast findings with the literature

The data found in the research is similar to that in the literature. Although the data is laid out in a different order and placed in different themes the literature findings can be found distributed throughout the data collected and analyzed. Some similarities are very obvious such as both the literature and the research indicating funding as being a barrier and both examining intergovernmental and interdepartmental barriers. Similar data found are noted in different categories, examples of similarities can be viewed in table 10.

Table 10: Similar findings in the literature and data.

<table>
<thead>
<tr>
<th>Literature</th>
<th>Research</th>
<th>Brief examination of similarity and differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intergovernmental and interdepartmental barriers</td>
<td>Theme two: Intergovernmental and interdepartmental</td>
<td>The focus on mandate and overlapping responsibility are examined in both. A lack of working together is mentioned in both, the literature goes into further depth on the topic than the findings in the research.</td>
</tr>
<tr>
<td>Institutional barriers, standards and designs, policy and innovation</td>
<td>Theme three: Political</td>
<td>The research mentions multiple barriers the literature has represented in their own category, such as standards and designs are spoken separately from institutional barriers. Within the political barrier for the research there is mention of aspects of institutional barriers (e.g. working together), as well as standards which are noted as a barrier in themselves because they favour vehicles and do not allow for innovation (a barrier on its own in the literature).</td>
</tr>
<tr>
<td>Built environment and infrastructure</td>
<td>Theme five: Human nature</td>
<td>The overlapping barrier mentioned in these two sections is car culture that</td>
</tr>
<tr>
<td>Literature</td>
<td>Research</td>
<td>Brief examination of similarity and differences</td>
</tr>
<tr>
<td>------------</td>
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<td>--------------------------------------------------</td>
</tr>
<tr>
<td>Built environment and infrastructure</td>
<td>Theme seven: Physical realities</td>
<td>Unlike human nature the physical realities findings in the research are more similar to those mentioned in the literature such as how communities are constructed. These also include less frequently mentioned barriers such as weather.</td>
</tr>
<tr>
<td>Evidence and academic</td>
<td>Theme eight: Lack knowledge and awareness</td>
<td>These sections both focus on a lack of knowledge, whether it be transportation trends or the evidence to support decisions to implement MMT strategies.</td>
</tr>
<tr>
<td>Urban solutions</td>
<td>Theme five: Human nature</td>
<td>In both of these sections they mention a perception that other solutions will not work in the community and that a different solution is needed. The research focuses more on this perception as a subsection of a greater perception towards MMT while the literature emphasises it as its own point. Regardless, both mention this barrier.</td>
</tr>
<tr>
<td>Funding</td>
<td>Theme four: Funding</td>
<td>These sections both focus on funding which can be a barrier when projects are costly, from studies to building to upkeep – a lack of funding or a small tax base can make it hard when trade-offs must occur and do not always favour MMT.</td>
</tr>
</tbody>
</table>

Evident through table 10 there are the number of overlapping themes and barriers from the literature and the research findings. Barriers are all perceptual but there is some support to show that the findings of this research are in line with the
literature. Although conclusions cannot be drawn from only this research and the literature, it does show that there is some support for the existence of barriers.

Some nuances that are mentioned in more detail in the research are things such as emphasising the lack of density in NB, this is not mentioned throughout the literature. The literature also fails to mention the lack of priority given to MMT; however, this can be a reflection of the research focus on barriers when implementing, rather than barriers in general since in the research the barrier of not focusing on MMT could have potentially already been overcome since projects were being implemented, unlike the communities examined in this research. The research also has a focus on how implementing strategies can take a long time and can be difficult, this is not shown as clearly in the literature, nor does the literature mention unexpected barriers.

Appendix K gives an overview of the themes and whether they are present in the literature. These differences are not to dismiss the findings of previous research, instead it shows that barriers do exist, and that more exploration can further uncover the nuances of barriers. At this point a conclusion that can be drawn is that the findings of this research do support the majority of barriers mentioned in the literature, with only three additional barriers mentioned in the research but not emphasised in the literature.

4.4 NB context for MMT

Informants are asked whether they perceive MMT as an appropriate solution in the case studies and NB. Due to the informant’s relation and employment in or around transportation, participants spoke positively of MMT and its potential to widen the
resident’s transportation options. Informants are individuals who are promoting MMT systems such as transit or the overarching transportation network and believe in the benefits derived from MMT.

There is reluctance in how applicable and appropriate MMT is for the entirety of the NB context, as Mary says, “you’d have to talk to a lot of public because I’m just a transportation expert for the city.” Leaving the decision of whether MMT is appropriate for NB to the wider population living in the communities. When discussing MMT appropriateness in NB and case studies, informants also mention the existing transportation needs that are not being met by the current system. Although this information is introduced in the literature review, the informants mention of this need will also be included since it leads to the appropriateness of MMT due to a need requiring fulfilling; however, whether MMT is the correct solution is not known.

While discussing the appropriateness of MMT in NB, Logan spoke to the process of attempting to implement a transit strategy as being a person to person relations and work through person to person. This method of gathering data highlights the transportation need in NB for Logan since he personally engaged in emotional conversations. Individuals told stories of not being able to see family members, or access services, or suffering from losing the ability to travel. As Logan says, these stories “makes it very, very real” and they use these stories and dialogues when making the argument for the transportation need in NB as often being “the key roadblock to allowing people to access services” (Logan).
Amongst the personal anecdotes there is also the economic benefits of keeping an individual in their homes rather than the provincial expense of placing someone in care. Elizabeth partook in a study which interviewed individuals in the NB population, again concluding with transportation being an important topic. This is a second example of NB residents raising their concern regarding transportation such as the quote shows:

… we did public dialogues and the three questions we asked them were:

1. What can we do as a province to reduce poverty and increase social inclusion?
2. What can we do as a community to reduce poverty and increase social inclusion?
3. What can we do as an individual? And then when we got the feedback a lot of the stuff was around transportation. A lot of the comments were. ‘we need a way to get around,’ (Elizabeth)

In Logan’s community alone he says that “about 25% of the population at least has no access to a car. Young people [the researchers age] don’t buy cars in this area or if they do it’s pretty limited, it’s too expensive, or it’s a personal decision not to.” This shows that what is impeding people from buying a vehicle may not simply be monetary constraints, it can also be a choice.

Logan and Westley both brought up the question of whether “there [is] a need for transportation and public transportation and if it is what is it?” (Logan). Simply knowing that there is a transportation problem (if there indeed is) does not mean MMT is the solution to address that problem. This question is beyond the scope of the research even though it does relate to certain barriers, such as priorities and human nature,
because these are questions asked by those trying to implement strategies or working in relation to transportation.

As Westley indicates, if 50 years ago the goal was to increase the number of individuals driving which is now the reality that we live in, what is to say that desire has changed. This brings the question of what the transportation needs are in the province and whether those goals are still being strived for today. As will be shown, transportation is a complex process and system. Throughout the chapter there will be further examples of how barriers are not isolated, instead, they cross into other barriers and relate to one another.

The reality of transportation in NB is restrictive to certain modes, as Elizabeth discusses, there lacks existing MMT options beyond the single occupant vehicle or the few dedicated alternative infrastructures in cities. Unlike other cities

There’s not a whole lot of ways to get around if you think about it, but in New Brunswick we can walk in the cities but in the rural there’s not lots of roads [that] have shoulders you can walk on them, and you can’t walk in the roads in the subdivisions, it’s difficult. Bike trails are great in the city but not in the rural context, 90% of people in New Brunswick travel by car to employment. Our bus numbers are way lower than the national average… (Elizabeth)

Although there are options in cities, a large percentage still travel via automobile or live in communities that do not lend well to MMT, such as lacking sidewalks or bike trails. Alternatives, such as train are not as plentiful, as Elizabeth, Westley, and Logan all mention how “[w]e have a train that goes through twice a week…” “which is heavily subsidized by the provinces even though it’s not a provincial responsibility” (Logan).
Another example is the bus service that does exist in the communities, although they offer a good service for what they are tasked to do, Westley mentions how “they are tasked to provide a service, but the nature of that service hasn’t changed in 40 years…” This service may not be adequate to be an option for the majority or be relied upon when competitive means of transportation like vehicles are more appealing. Similarly, the infrequent train service cannot compete against a personal vehicle. This will be mentioned again as a service which exists but does not lend itself as a viable mode of transportation due to low travel frequency. This does not take into consideration the barriers from adverse weather and topographic constraints, as will be discussed in further sections.

When it comes to transportation, Matilda makes the link between health and activity levels throughout the day:

[A] big challenge for us if we’re looking at how to encourage people to be active throughout their day, because there’s only so many people who are choosing to go to the gym but not many people choose to go to work or school – they’re going to go but how they get there is really important to us.

However, without options it means there is a reliance on a primary mode which is often a personal vehicle. Since there is such a high reliance on vehicles for commuting, this mode of transportation does not allow for healthier alternatives found in MMT. As others mention, there is a clear need for transportation options, but there is also a need for healthier options – meaning that providing a vehicle to an individual may not be the solution which address all, most, or some of the concerns regarding addressing
transportation needs in NB. It is not yet decided whether MMT is appropriate for NB and addresses the transportation issues and related health issues that exist.

### 4.4.1 Appropriateness of MMT in NB

Most participants noted that MMT is appropriate with the specification of it being most appropriate in urban areas. No individuals said MMT is not appropriate at all regardless of context or location; however, this can potentially be due to the participants already being in favour of MMT since they agreed to participate in the research and are positively biased.

It was previously mentioned that alternative modes of transportation are lacking in NB. Billy, Elizabeth, and Mary all highlighted the need to provide those alternatives that MMT allows, which currently do not exist, especially alternatives that are as efficient as a vehicle. Although not everyone will take the bus, as Billy mentions, having those options will allow individuals who cannot afford a vehicle. And “to get everyone to where they want to go, I think that Multi-Modal is the only way to go.” (Elizabeth). Ron elaborates on the same topic with how MMT is essential for equity in transportation by placing everyone on a fair level, as well as the benefits found in MMT, such as health and the environment, as Arthur added. MMT, as stressed by Billy, Elizabeth, and Mary, is to create options for individuals, it is not about being “restrictive on one or two options because that’s when you’re going to set negative views and the barriers will come up then.” (Mary). MMT is creating options which are safe, and people feel comfortable using, making MMT appropriate for NB.
MMT is important in rural areas, Logan says rural areas need MMT such as dial-a-ride, since large scale infrastructure pieces are too expensive and the population or business model to support it (such as rail) does not exist, but individuals still need a means to get to the big cities. Ron agrees with MMT being essential for connecting areas since folks do not remain in one community, noting that those who live in Moncton, Dieppe, or Riverview do not necessarily work or shop there, they may be commuting to one of the three communities and transit is essential in creating that connection.

MMT is further exemplified in these communities through the ability to place bicycles on transit and move from multi-use trails and bike lanes to transit use. As Ron says “[it’s] a connection that we have for the choices the folks want to make and can make here in the city,” regarding transportation. Beyond infrastructure, there are also instances of collaboration between departments in a municipality to encourage AT. There is also an existing MMT plan which aim to provide guidance on public education, which is helping with promoting walking and transit use as well as other available options.

Benefits are being examined from the existing MMT strategies implemented. Over the years there has been an increase in volunteer driver services, beginning with two in 2009 there are currently 11 to 17 being provided within the province with adoption and adaption so it may become a promising practice across the system. Elizabeth and Westley mention that the volunteer driver services have community ownership as “we see the benefit as people develop relationships with other people in their community,
like that mutual support system, it’s nice, although it’s transportation it’s more.”
(Elizabeth).

Leveraging the family and friend aspect of volunteer driver services may be why it is gaining traction across NB with more being offered in different areas. This means of providing transportation is run on the backs of volunteers and may come with its own barriers, such as not having the right incentives could drop the rate of volunteering. Logan also mentions that there is a monetary benefit since these types of transportation are cheaper than the alternative, such as using a taxi. Currently there are means of MMT being offered, whether it is a city service or volunteer who are “groups [who] understand the need and coming forward and doing it for the government, if you like.” (Logan).

Other informants feel that MMT is appropriate, however, they recognise that it is not entirely available yet due to different reasons, such as “multi-modal [being] fairly new topic, municipalities are working on their centre core and their own areas first and I think once they have that down they’ll start spreading out to the next community.” (Johnny). Meaning that the interconnectivity of MMT is not being addressed due to the understandable prioritization of a community’s core.

Matilda raises the concern of how and should we aim to have individuals have alternative transportation options to the car when some communities are losing services and some aging individuals will not want to leave those communities and will lose the ability to drive themselves. Yet, these communities are throughout NB and “if we can’t
adopt our modes of transportation for our rural communities than we’re in big trouble” (Matilda). With transportation strategies and alternatives needed for these more rural communities’, participants did note that MMT is more for urban areas and that NB may not have the provincial population to warrant it yet. However, this does not deter from the MMT within communities which Johnny says he sees happening in some areas. Informants do agree that MMT is appropriate, predominantly focusing on urban areas, there are still barriers as to why MMT is more long term and not a reality at this moment, these barriers will be discussed in more detail.

4.5 Themes: The barriers to implementing MMT strategies

It should be kept in mind that these barriers came up during interviews but not all informants mention each barrier and some informants did not agree with all barriers mentioned. For example, Billy mentions that there is no population demand for MMT while Ron indicates that there is a demand, specifically for public transit. Because the research focuses on existing barriers, in the previous instance, Billy’s barrier will be included in the research while Ron’s mention that the same barrier does not exist will not be included in the research. Therefore, it should be kept in mind that these barriers are mentioned but do not represent all twelve participants and should also not be applied beyond the scope of this research.

Figure 1 outlines the themes and any subsection which composes a theme, these themes compose all the barriers found in the research. These themes will be examined in further detail and expanded upon in the following sections.
4.5.1 Theme one: Priorities barrier

This section covers the barriers that informants mention regarding implementing MMT strategies. The overarching theme of the section is that MMT is not a priority, this is found through a lack of balance between supply and demand, lacking a big picture mindset, lacking a champion, and there being no catalyst for making changes towards MMT.

4.5.1.1 Not a priority barrier

There is a link between priorities and public demand, as Johnny highlights “municipalities are always, or agencies are always going to look at it as ‘what’s in it for me? How is this infrastructure going to benefit my residents?’”. Without the public demand MMT is not viewed as a priority in these communities, especially if there is demand for something else. There is a choice that has to be made and prioritising
something such as MMT where there is a lack of demand can be difficult for municipal councils who have to make the choice.

“I think every municipality struggles with the amount of priority that they have,” (Ron) which is hard when other priorities take precedence, such as one community dealing with water issues. In certain instances, transportation can take a back seat, especially when there are “wants and needs” (Charles) and as Arthur puts it “it comes down to priorities of the day”. Some communities have a harder time putting priority on MMT; or individuals who know what they need to do cannot convince the decision-makers that it should be a “priority over something else” (Matilda). And even within MMT, often times when there are priorities placed on transportation there are “more priorities… within our community” (Ron) rather than addressing MMT between communities. According to Charles there are also situations where MMT and transportation are priority but there lacks a push where “there’s talk ongoing all the time but let’s get a little bit more serious about it.” This lack of drive being a result of MMT not being considered a major issue to address and therefore not a priority.

Current mode share is also a barrier to making MMT a priority since it can be difficult to argue for change. As Arthur highlights:

The automobile mode share [is] so high [and] cycling mode share is very low that the idea of prioritizing one group that’s much smaller than the other over automobile traffic is somewhat challenging, especially when you go out of the urban core, that imbalance becomes greater and greater.
It is difficult to justify prioritizing transit at the provincial level since there are only “four transit systems in New Brunswick” (Ron). Even when organizations and charities have a health priority, it can be difficult to justify prioritizing infrastructure, such as walking trails or bike paths, when so few will benefit.

When it comes to MMT it is a “smoldering issue, we’ve been dealing with the big burning issues… when it comes to transportation, is it a hot button issue? Not yet” (Charles). Meggie has theorized that MMT, and similar smaller issues, are not prioritized because “it’s not a sexy topic” where priority is given to “the hot topics to hit the papers.” Hot topics are big transportation projects such as a new highway, Meggie especially emphasizes that “when there’s an election coming up you want to be seen with the big stuff” and unfortunately MMT does not cut it as “the big stuff”. When asked why MMT is not being prioritized, Arthur answers with “nothing really, just a lack of ‘we haven’t”, leaving the question of whether prioritization is entrenched in more than social demand, benefiting too few, or the time of the political cycle.

Amongst the priorities and crises of today, the focus is on what is important at the time, while “longer term decisions are difficult for governments to make” (Matilda). The inability to look long term is a barrier itself, especially when it comes to “investments today that will last for 20 years” (Matilda), such as roads. Billy raises the same issue where “everyone is kind of at the next year, next two years down the road when we should be looking at 20 years down the road and the stuff we need to do now to be there in 20 years”. This happens to both staff who may be “caught up in the day to day and they’re not looking at the vision or the long-term vision” as well as politicians who
are “seeing as far as [their] nose and seeing how many votes [they] need tomorrow” (Billy). This is a human characteristic. Matilda says that failing at long term planning “has nothing to do with New Brunswickers, as humans are terrible at understanding the impact of today on tomorrow”. Human nature is a barrier that will be examined in further detail in another theme, but it is mentioned in relation to priorities.

When it comes to thinking big regarding MMT and why we do not think big, Westley points to the fact “that there [isn’t] any incentive to think bigger”. Some organizations do not perceive that they play a role in MMT when, in fact, by thinking big they could see the solutions “to promote transportation in different forms” (Matilda). There is also a lack of people who see the big picture of how small actions can add up overtime:

Think globally even though, yah, this isn’t going to affect a million people what you’re doing here, it’s a small piece. If you can get less people on the road with their cars or more people exercising, it’s a little but when it all adds up it’s going to be big savings, big benefits. So, see the big picture and I don’t know if enough see that. (Meggie)

The big picture can be as simple as individuals not comparing and seeing the expenses of owning a vehicle versus a bus pass. However, Matilda makes the point that there is “the overwhelming problem of poverty at the individual New Brunswick level… it prevents you from dreaming big”, NB families will not make changes in their transportation since “they can’t afford to do it any differently than they do right now”, making it hard for individuals to dream big, let alone demand for those in positions of power to make those dreams a reality.
Arthur mentions that some areas may not be asking big picture questions such as how new development will be impacting transportation. This examination of benefits or impacts beyond a single department (e.g. development and transportation) is also seen in other areas, such as, it being difficult to invest in certain infrastructure or strategies when the benefits accrue in other departments. For example, if the Department of Transportation and Infrastructure (DTI) invests money in something that will save lives or reduce injuries, the resulting money saved will be seen by the health care system and not the transportation department. There lacks the big picture of seeing benefits that a certain department may not be seeing directly within their budget.

When addressing transportation problems, there is a barrier of relying on old methods and not looking bigger and finding different solutions for different problems. “Sometimes they’re transportation problems and sometimes they’re access problems and there’s different ways to address an access problem other than transportation” (Elizabeth) it is the act of “keep thinking and keep asking because there’s no one solution to it” (Elizabeth). It becomes a problem when an individual is a “hammer… and everything to him is a nail” (Elizabeth) such is seen in certain departments which are so ingrained in providing rural solutions, that they do not apply urban solutions when infrastructure crosses into a municipality with different infrastructure and where MMT may be applied.

4.5.1.2 Lack a champion

Lacking a champion or leader (the terms being used interchangeably) is mentioned by many informants. Amongst those individuals Logan emphasizes the
benefit champions provide; he mentions he was not able to get through the door when contacting certain business, while a champion could. The champion becomes an extremely important individual for progress and moving forward with the MMT initiative. Champions are also important within departments and at different levels of government to make positive strides, especially acting as “gatekeepers and [opening] doors for other meetings” (Logan).

Billy emphasises that a champion is needed for pushing visions and plans, such as situations regarding pushing for transit funding. When it comes to champions Billy says, “I think we need to take the decision because that’s where we want the city to be, that’s the vision that was established so let’s make it happen now.” However, someone has to “make the first step” (Elizabeth) especially if it is for a community to take the initiative and test “some things and ideas” (Elizabeth). Westley notes that finding a champion can be difficult if there lacks a reason to make a change:

The challenge is we [are] trying to transition people from driving in the long term, that means acting now to help change behaviour but that means you have to have someone take the leadership because there’s no reason for people to do anything right now.

The lack of catalyst or reason for people to act now is another barrier, and a champion is necessary to lead the way and push for change. Some informants spoke in general terms of needing a champion, while others specifically place the onus predominantly on municipalities and the province. Elizabeth says that someone either at the municipal or provincial level has to be a guide in investing “in the infrastructure that’s going to enable these innovations in the future”. Similarly, Billy feels that cities should
“take some leadership” while “the provincial government has to take some leadership in terms of providing funding options, and perhaps dictating where some of that money should be going” such as making sure the gas tax is invested in solutions to help combat climate change. Westley believes that the province and regional service commissions are in the best position to be leaders since they have connections with communities as well as removing some barriers communities may face. Johnny feels that the “municipalities will lead the province along” when it comes to MMT since he does not feel that the province will step up to provide different roads and infrastructure.

Although there is a need for a champion, Meggie makes it clear that not all champions are good and may make things worse for the initiative. These are the individuals who are a “loud mouth that doesn’t put his money where his mouth is” or “will go and interrupt council meetings with their signs and protesting and shouting loud”, resulting in a potential distance between individuals and councillors who do not want to be seen with disruptive people. There are also the individuals who “don’t start at all, there’s a lot of that” (Meggie) for situations where there could have been a potential champion, but no one stepped forward for whatever reason, maybe due to lacking a catalyst to spur them forward.

4.5.1.3 No catalyst

The lack of a catalyst for change is mentioned as a barrier to MMT strategies. Westley mentions that “there has to be some reason to foster a shift” in how people travel, but nothing is currently pushing people to change their transportation modes. As Charles says, “it takes a cataclysmic effect to change somebodies’ attitude right away.
There has to be a major upheaval in the transportation world”. There are current factors that can point to the requirement to change transportation habits, such as obesity rates and climate change. However, both Matilda and Meggie say that the impacts of our habits have to really “smack us in the face” (Matilda) or “that big flood comes and Noah’s out there grabbing two animals” (Meggie) before anyone changes. Change is individual, and negative impacts have to be felt personally, but change (e.g. climate change) is still happening too gradually to act as a catalyst. Individuals are not seeing the need, nor are municipalities, regardless of what is already known pertaining to the unsustainability of current practices, or negative impacts that are alleviated through MMT.

Charles notes that there is “no motivation to do that [MMT] study” or explore ideas that can potentially be turned into regional transportation. When talking about a lack of catalyst to move away from the single occupant vehicle, multiple informants mention needing catalysts such as a drastic increase in gas or parking prices. It is mentioned that the aging population is not viewed as a catalyst for change even though their future needs for alternative modes of transportation are raised during the interviews. Another informant mentions that a catalyst could potentially come from the province, if it were to push for a wellness approach to transportation. Or the catalyst required is unfortunately jarring for many people, such as “a famous person [getting] killed, unfortunately, that’s a bad thing.” (Charles). Elizabeth is hopeful that the MMT document that was recently adopted can act as the pivot or catalyst to the pivot for changing current transportation trends.
4.5.2 Theme two: Intergovernmental and interdepartmental barrier

In this section the theme of intergovernmental and interdepartmental barrier is explored. These are found through a lack of mandate and silos restricting organizations and departments from working on MMT. A lack of working together is also a barrier noted by informants. It should be noted that certain barriers mentioned are not negative in the sense that informants did not specify that they should be addressed, on the contrary, it is mentioned that other strategies should be taken, such as working together or understanding that everyone has a role in MMT, and that lacking a group with a mandate for MMT is not necessarily negative, since a lack of mandate can be addressed in alternative ways. This is found in multiple barriers, but it is most emphasized in this specific theme.

4.5.2.1 Lack of a mandate and existing silos

Matilda mentions that unlike other provinces NB lacks a “community ownership” where different organizations are all thinking about the wider issue of health and MMT, such as schools and hospitals. However, the lack of a “community ownership” in NB is not something that “makes us crazy standout” (Matilda). Westley and Matilda both mention that MMT is not necessarily someone’s job, there lacks an individual with the mandate. There is either an overlap or lacking mandates all together, with the misconception that it exists as another department’s mandate, as Westley explains:

We have a barrier in the sense that a lot of people are doing little pieces of transportation, a lot of overlapping and underlapping responsibilities but it’s not always clear who’s taking charge…let’s put it this way, people know who to call when they have a pothole but if they can’t get to the doctor they don’t know who to call… the Department of Transportation
doesn’t have that mandate, people think they do but they don’t – it’s not assigned to them.

There is a potential lack of knowledge, but the people responsible for transportation services beyond infrastructure are not well defined. The jurisdiction on infrastructure also changes which can be a barrier for MMT facilities. Johnny had the experience of trying to have pedestrian infrastructure installed but the facility would be on a provincial highway and it was denied, “we don’t have complete control over it.” Similar collaboration has to be done for infrastructure such as bridges which are federal but are found within municipalities.

Mandates also make MMT convoluted, especially since transportation crosses a number of mandates, such as one department dealing with infrastructure while another department licenses all the routes in the province for transit. Another example of convolution is for the DTI who only “build roads, bridges, and culverts” (Logan) yet they also run all the school buses and contract them to the department of education, making it confusing when DTI potentially claims that they do not provide social services such as transit. Mary feels that some departments are becoming more lenient towards MMT infrastructure; however, there is still struggle resulting from departments not having it within their mandate. Arthur feels that there is a lack of mandate where MMT facilities do not fall within the mandate of those providing transportation within certain jurisdictions.

Some informants also make it clear that they work in relation to transportation, but do not provide transportation services, and rightfully not within their mandate. The
same is said for those providing transportation within a community rather than between, this is not a fault even though it may be perceived as a barrier to MMT between communities since there lacks an individual to fill that position. Billy and Mary both feel that provincial transportation and planning are predominantly focused on rural which can be problematic when MMT is perceived as predominantly an urban application. However, Billy does mention that the Province does have “things to improve transportation between cities and rural” areas even though he is not directly involved in it.

Beyond departments and organizations that have mandates within transportation, there are also volunteer groups and grassroot groups in NB who face their own issues. Logan is part of one of those grassroot organizations and he mentions how the province is slowly changing their perception on transit services, instead of waiting he works to set up a project to fill a transportation gap. He notes that this is “a huge amount of weight on my shoulders because if I screw it up, [the government will] say ‘well, it doesn’t work. That project didn’t work we don’t have to do that.’” Along with the added stress of their volunteer association being run like a business out of necessity to be successful.

The sheer demand is problematic especially when people do not volunteer since “complacency is sort of a character trait of too many people” (Meggie). It can be tricky to keep volunteers once you have them; Elizabeth notes that when volunteers are paid (e.g. for gas for a volunteer driving program) the volunteering rate drops. Lastly, charities and volunteer organizations can only do so much, Meggie gives the example
of how the Lung Association does free radon testing, however; they cannot provide funding to pay for fixes when bad air is detected.

Silos are noted as a barrier, yet, Matilda thinks that silos do not necessarily have to be broken down even if they are a barrier. Everyone has a role regarding transportation because “there is no one solution for this, everyone has to have a solution and be part of that solution.” (Matilda). Certain types of silos mentioned are between communities and private investors due to a low tax-base for funding. Departments working on transportation are doing a lot in silos whether it be municipal or provincial departments, “transit operations over-here, DTI operates their roads over-here” (Westley). There are silos “across different levels of government” (Matilda) such as provincial bridges and train tracks meeting up with municipally owned infrastructure.

Silos also impact how departments allocate funding, spending it in a way that benefits are seen within their departments, when “we just need to think about different ways to account for the cost and benefits in a way that get around those silos” (Westley). This is especially important since “siloing [sic] is really how we function in the west… transportation isn’t just this one thing, it’s all of these things.” (Elizabeth).

Ron mentions a different silo not mentioned, where one system is divided into three communities, but the funding model keeps the system from crossing into other communities, and creates issues where otherwise easy solutions can be implemented. This is an instance where a shared service is complicated through the implementation when otherwise the service could be improved to alleviate the complications. Lastly,
Elizabeth comments that councillors need to have the lead for when their “ducks are in line they can support the communities in a reasonable way” since governments who currently work in silos do not have authority over other departments.

4.5.2.2 Lack of working together

There is a need for MMT conversations because “if you don’t have those conversations, if you don’t keep talking about it, it’ll get lost in all the rainbow of issues out there” (Charles). However, according to Arthur, those conversations are not happening. Mary says that some conversations are happening but there is a need for higher level discussions involving bureaucrats, politicians, and municipalities. There is no push for conversations because of concerns over it being too easy to drive, even the people in the public need to “help drive some of that discussion” (Arthur).

Beyond conversations there is a need for organizations, municipalities, and provincial entities to work together. Having conversations and working together can be challenging, but it is important. Elizabeth is involved in a project that is a good example of realizing the importance of working together and involving multiple individuals since “there’s not one transportation… everyone has a piece of it and to figure it out” and resulted in push for the involvement of twelve experts in different fields. Mary recounts a similar situation where three communities accepted a MMT plan which they all collaborated on; however, the individual community have to act on moving their part of the overall plan forward. There is still a resulting lack of regional planning since an individual still has to take the lead in that respect of the plan.
Working together is important for large issues, such as health benefits from MMT and creating transportation options, because everyone has a responsibility, but most municipalities do not see their responsibility and do not act or consider what could be done or improved. It is important to get all “the pieces working together, it’s like a well-oiled clock, if they’re out of sync it doesn’t keep time very good” (Charles), this applies to large transportation initiatives which often cross beyond a single municipality. However, according to Westley, NB is not quite ready to have “agreement among incorporated entities to work together for transportation planning”.

In some instances, individuals working together can be strongly opinionated in their personal priorities. Elizabeth has worked on a project that has had these difficulties arise since individuals in the group are from different organizations, and some have priorities around disabilities while others focus on the built environment and active transportation. However, the group used consensus to make decisions and that helped improve the final product since

Having people with operational background, people with advocacy background, people with academic background, it’s interesting. I think the tension really made the report into a better document then it probably would have been had there not been tension amongst different groups (Elizabeth).

There are also instances where a lack of participation exists. Billy notes that a barrier is that the province is not participating in public transportation when “if you look at other provinces public transportation is financed quite a bit by the provincial government.” There is more that can be desired between provincial and municipal collaboration, such as the province not being interested in cost sharing for cycling
infrastructure, as Johnny notes had happened in 2007. But, collaboration between the two entities is very important, and Mary would like to see more happening with larger municipalities since “we’re your heart… we’re pumping the blood through the veins of the province and if [the province doesn’t] give us the opportunity to make things better for the community and make the city… grow and I think a way to see our city grow is not just catering to the car because that’ll just kill your municipality.” However, Matilda and others note that the collaboration has to come from the local community level, especially since municipalities have a lot of MMT resources and provincial “departments don’t always align on” (Matilda) MMT.

Organizations, such as non-profits, also have to work with the provincial government which can be time consuming. It is tedious to work from person to person in an attempt to get the high-level deputy ministers to speak with each other. Hopefully getting the outcome the organization wants which is to be allowed the authorization to information that is private but will help inform decision making. There are also decisions that can be made at the provincial level but not include individuals in the community, such as the gas tax funding being used to upgrade rural roads but not allowing the rural areas to have a say or “whether it should be supporting any kind of service” (Westley) in the area instead.

There are internal and external challenges when it comes to working with others, internal can be staff and attitudes while external can be how a municipality connects with other municipalities which does happen, but improvements can always be made.

There are four main associations in NB: Union of the Municipalities of New Brunswick,
There seems to be some tension when Meggie mentions a smaller community’s relationship with a larger community. Understandably, the larger community will keep their resources close and potentially not work collaboratively on ideas to increase options for the smaller community to commute to the larger community, such as a bike path through the forest. Meggie feels the tension when she says that “they don’t care because it’s us, we want to get there, they don’t care if we go there or not”. Difficulties are also seen when municipalities and organizations try to work together. For example, Ron works with the local university that had recently held a referendum which resulted in a decision to continue to not include a bus pass in the tuition.

Mary notes how they recently recognized that an outside organization who “would love to come in and step up” can be great advocates. She said that they hope to “see more and more of a closer relationship with those individuals or those groups to really help the city move things forward” and work in partnership. Working together is good and important, but the new-found partnership can have drawbacks. Sometimes those you are working with may have concerns (such as legal concerns) and drag their feet resulting in a slow process, as Logan has experienced. Matilda experiences the opposite, characterising slow-moving people as being more engaged and believing in
what they are doing. She notes that “working together is always a good idea if it’s slower than someone going ahead and doing it themselves” even if not everyone is “pushing hard on a Friday night to crank something out on a Monday morning”. There are bad ways of slowing things down, such as killing time for the “right opportunity in the political cycle”, “dithering,” or “over consulting” as a means to slow the process (Matilda).

When working together, differences in a community’s perceptions of transit can be amplified if they are attempting to provide a uniformed service. A community with a lot of growth can potentially argue for more improvements which a community with little growth may not match. Alternatively, one community may increase the time frequency for the bus system and result in the service not matching at connection points. These are difficulties that may arise when a community has full autonomy over their own system while trying to collaborate with other communities, for better or worse. Conversations can also have their downfalls since organizations work with government entities and these government entities talk to each other, making it important to be consistent and “be very conscious of what your credibility is and see the larger picture of what you’re doing at the different levels, it’s not isolated.” (Logan). It is important to work with others, but that collaboration may not always occur, and when it does there can also be drawbacks, as mentioned.

4.5.3 Theme three: Political barrier

This section explores the political barriers which informants mentioned, these include politics and policies, as well as reactive rather than proactive politics and
policies. Often the political decisions are intertwined with different barriers, such as making a decision without public demand, and that decisions often rely on trade-offs, which will be mentioned in the funding barrier.

4.5.3.1 Politics

Barriers exist at the political and policy levels, as Meggie puts it, “they have to legislate things but that’s a lot of bureaucratic bullshit and all it is, is lawyers getting involved.” More specific examples of barriers are the existing government model in NB, there is “over governance at the local government level” (Charles) that is demanding resources, as mentioned in the Finn report to which Charles is referring.

Logan mentions learning the “pecking order, who has control, main gatekeeping, who will help and who won’t” is important in making progress, which can be time consuming and depend on the individual holding each role for a certain term. Sometimes it can be entirely impossible to “break into the levels of bureaucracy” (Logan) to speak to the right individuals. And elected officials have a “very wide variation of capacity” (Logan) depending on their background, meaning these individuals will not know everything since “you can’t expect those people to right away have all the knowledge base around” (Logan) especially since there are a range of issues they will face.

Communities are not necessarily engaged when the minister makes a decision as their ‘mayor’ because of the LSD model. There is a “pretty good disenfranchisement when it’s time for people to understand how those mechanisms work” (Westley). There
are also instances when people are well intentioned, but they cannot make things move forward, raising the question of how people can get around the mechanisms of governance. Informants have differing opinions on the function of politics and where decisions are made, some feel that senior managers make the decisions and councillors are unaware or lack knowledge about the budget and terms of process.

Politicians that do make a decision have a hard time, as Matilda mentions, because unlike doctors, politicians are not keen to be the first to propose solutions that the public will react with “you guys are crazy, this will never work”. If there is a lot of public pressure than the politician’s job is to react to that pressure, as mentioned in the lack of demand barrier, since politicians need to examine what is good for the voters. The democratic system means that it is hard for politicians to make certain decisions if there is a lack of demand. Even when MMT plans are created, some plans move faster than others or some may stop all together because of shifting demand. At the end of the day, councillors have to ask what is their capacity “within their own issues and context” (Liesel). Overall, there are “political layers [around] public transportation” (Logan). Matilda raises the points that unlike British Columbia, who has more green parties, NB is not there yet, and whether simply changing the political party will be enough to increase MMT is unknown.

4.5.3.2 Policies

Policies are mentioned as a grey barrier. They are considered grey because there is almost always an opportunity to break that barrier; however, sometimes it results in an individual sticking their neck out or proposing the MMT solution through a
pilot project, Mary recounts. Policies and legislations are complicated, “it’s interwoven into so many different areas in government” (Elizabeth). It is important for municipalities to be involved when policies are being created for MMT, instead of “bureaucrats sitting at a table and trying to figure out what is the best policy they can implement for the province” (Mary). That way the resulting policy, legislation, or taxation is smart and the “healthy choice the easy choice” as Matilda relates it to her practice. Instead of bad solutions that may have bad repercussions, such as pricing vehicles out of peoples reaches or banning a type of bus due to an unfortunate accident, even if the bus has its uses. There are situations where policies or legislations, such as some acts, are brought in very quickly with potential repercussions, while others take longer and people have to wait for the policies or legislation to come out.

There is a lack of MMT policies where appropriate pedestrian, cycling, and transit infrastructure is integrated in roadway upgrades or new development; or a policy for using volunteer driver programs so that it can be a “first choice rather than their last resort” (Elizabeth). There is a lack of overarching policies pushing municipalities to identify how transportation or infrastructure projects will improve community health. However, the lack of these policies is not seen as a barrier by Matilda, who brings it up to require communities to think of health can be a “key lever to move them into that space who aren’t already”.

The policies and legislation that do exist lack teeth; this is evident through wording such as “‘you may do this’ it should be ‘you shall do this’” (Meggie). Regarding implementation, there are barriers when it comes to warrants. In some cases refusal to
implement certain MMT infrastructure is due to the roadway not meeting the warrants, but “I can almost guarantee that there’s no formal warrant” (Arthur) or where demand is existing by only the new standards providing a “better argument which eventually allowed for installation to happen” (Johnny). In some instances, a by-law may exist that prevents communities from working together due to the problems around funding set out by said by-law.

According to Westley, some policies and legislations that do exist are not helping and should be addressed. There are policies and legislations that do not allow for communities to be flexible in their MMT strategies. The Motor Vehicle Act is mentioned as one of the pieces of legislation that is restrictive to municipalities that may want to be more MMT supportive but are required to follow the act. Unlike some provinces which allow for municipalities to use TAC as a guideline and produce their own transportation guidelines, some NB communities are restricted to the TAC guideline and unable to vary from the minimum requirements. Mary gives the example of the TAC guidelines creating complications when they attempt to create a shared space where motor vehicles and pedestrians share the area. TAC has strict guidelines as to where vehicles have to be in relation to pedestrians that does not lend well to a shared area. Similarly, Arthur attempted to prioritize pedestrians and cyclists at a multi-use facility crossing the road; however, the Motor Vehicle Act and TAC outlines the vehicle has priority, and Arthur is unable to supersede the Act.

Mary does not see these restrictive policies as proactive and says that there should be more proactive policies where municipalities can create their own parameters
on the infrastructure policies. Not being proactive is mentioned as a barrier; Charles feels that by being reactive the province and municipalities will have to pay more in the long run. Elizabeth feels that being reactive will cause headaches when it comes time to implement strategies since the foundation will not have been built. However, Matilda notes that NB being reactive is not any different than other provinces and does not make the province any worse than others.

4.5.4 Theme four: Funding barrier

There are multiple aspects to funding that compose this barrier; there is the monetary attachment to implementing strategies and infrastructure and the lack of tax bases to garner funding. Staffing and resource allocation are often mentioned in relation to funding since more funding can result in an increased number of staff. Since every dollar can only be spent once, trade-offs are mentioned in relation to funding.

4.5.4.1 Funding

Funding is often mentioned and stressed during the interviews. Some informants even boil down the barriers to funding being the main culprit hindering MMT initiatives and strategies. Arthur mentions how funding is increasing overtime, which makes it hard for him to completely lay the blame on funding, however, he acknowledges that funding often “leads to a lot of other pieces of it too, you can improve bus stops or your trails”.

Even when there is money, there can be complications or barriers, such as having money but not being able to “get it out fast enough” (Charles) resulting in some money being unused. Complications can arise where an organization requiring funding
has obstacles placed in its way due to the wrong status (e.g. not-for-profit versus charitable). Where funding exists but it is strictly dedicated to infrastructure and buying buses which raises the concern of “you can buy a new bus, but you don’t have anybody to drive it” (Elizabeth) due to a disconnect between funding operations and funding infrastructure.

Some informants note that funding is a second stage problem and that either a prior barrier has to be addressed or a solution has to be envisioned before tackling the funding barrier. Funding is complicated, especially when individuals in certain areas may not use the service and question why they should pay for it. Some individuals may be facing individual levels of poverty and are unable to envision or partake in alternative methods of transportation beyond what they currently use.

Overall, funding is mentioned a number of times as a barrier, “money would be the biggest barrier, funding such a service” (Charles). It is stressed that some strategies are expensive to implement and even if planners know what they ought to do, they cannot do it within their limited budget. Population and demand are mentioned in relation to funding which is understandable since some strategies, such as transit, are often heavily subsidized, which is a continued burden (depending on the mindset).

As Elizabeth puts it, when trying to implement MMT strategies “it’s hard to do so much with so little”. Often individuals in a community do not realize how little money municipalities have or how much a strategy may cost. Meggie learnt this first hand, “I didn’t realize until I got into government, until I got elected exactly how much money we
don’t have”. And the cost does not end after implementation, these facilities have to be maintained, “it’s nice to have that waterpark but if down the road you can’t afford to maintain it than there’s no point in building it” (Johnny).

There is a certain “leap of faith” (Charles) when funding certain projects since councillors have to spend money wisely with their limited budget. When it comes to MMT infrastructure, it is often the case that municipalities have to fund the entire cost of the project. Mary gives an example of attempting to cost share with provincial and private organizations for a new pedestrian bridge over provincial and private infrastructure, but no agreement was reached meaning that the municipality would have had to cover the entire cost which a lot of municipalities and communities are unable to do.

Unlike other provinces, “New Brunswick is the only province where there’s no provincial funding for public transportation” (Logan). When having to fund a large portion of strategies, if not all, municipalities can be strained due to a low tax base. When strategies are proposed, such as improving public transportation, people can be resistant to increases in their taxes even though they may be supportive of the solution.

4.5.4.2 Resources

A lack of resources is a barrier that can potentially be addressed through increased funding. However, as Matilda says, “do we want more resources and more time? For sure. That’s the problem and the lamentation of an ambitious organization. It’s just a creature of life.” Sometimes development occurs beyond the boundary of an
organization or community and they are unable to move their resources to service that area. For example, a big neighbourhood developing away from a transit route is unable to be serviced since it would detract from existing services and resources already in place.

A lack of staff and technical staff can impede implementing strategies since it requires outside resources, such as consultant firms. This is not always seen as a barrier, but it may be problematic if a community does not have the funding to allocate to these projects. With already cumbersome workloads it can be tricky to find an individual to add a new MMT project into their workload when they have other pressing matters. Matilda gives the example that if an “immediate crisis” were to happen, the same people who are working on transportation would move onto that project since “we’re only one of me and one of a few other people” (Mary) when it comes to addressing MMT projects.

At times the day-to-day is what hinders staff members from addressing MMT strategies. This becomes problematic when “everyone is caught up in the day-to-day and they’re not looking at the vision or the long-term vision” (Billy) and make decisions today that can have been modified to be more long term and supporting of the vision. This is potentially a barrier faced by more communities than just those in NB where everyone is faced with addressing

… the crisis of the day. I don’t think we’re doing an incredible job planning things out, like I said before, we don’t do anything worse than [other provinces] but I think we’re focused on whatever is important at the
time and kind of long term decisions are difficult for governments to make, they're really difficult. (Matilda)

There are also instances where the larger long-term vision is to increase transit use but there is an increase in parking to accommodate the driving public, doing the opposite of what should be occurring, which would be reducing the parking.

Communities are not without their resources and sometimes it is less a problem of what a community lacks and more about how they allocate those resources. Billy finds it difficult to advocate for more funding for transit, he says that “we don’t think twice about paving a new road or creating a new road but increasing hours in public transit it’s nail biting… it’s difficult because people aren’t there yet.” He further explains that resource reallocation can be tricky for the fact that “everyone is kind of looking at their own” budget and do not want it reduced to be reallocated elsewhere, whether for better or worse depending on perceptions. Mary is also supportive of wanting to reallocate funding towards MMT projects, even adding MMT aspects to existing projects and potentially not adding a lot of additional costs.

Resource reallocation is mentioned in relation to the provincial government who subsidize individuals for medical trips. Elizabeth proposes that funding should be reallocated to “subsidize the community to provide a transportation system” instead of subsidizing the individual. She also mentions that provincial money should be reallocated “to support the grassroots and the community champions to enable their best practice ideas or practices to evolve to a point where they meet all the demands in their area.” As previously mentioned, funding in itself is a barrier and reallocation can
potentially alleviate some of its burden, assuming that no greater burden is created from moving resources around.

The decision process involving trade-offs is a barrier mentioned by informants. With limited resources and funding, it becomes difficult to decide where money is invested, “it’s a political trade-off” (Arthur). Three different informants bring up similar examples of trade-offs that pull on the heart strings and make decision making difficult for those in charge. One of those examples is given by Elizabeth:

... you go and sell 50 thousand or hundred-thousand-dollar study that you know is going to influence and support decision making worth tens of millions of dollars down the road at the regional level but if you had to choose between a kid’s summer softball and a ball park [or the study]. These are the kind of trade-offs they make.

Informants emphasise funding more than they did for resources, but they make the clear link that with increased funding can address a lack of resources. However, as Matilda mentions, an organization or an individual being taxed beyond their resources is potentially the reality of attempting to do more with less. Something noted in funding was individuals trying to do a lot with a little and in turn are faced with the reality of trade-offs when making choices on where to spend the limited budget.

4.5.5 Theme five: Human nature barrier

Human nature barrier is found through perceptions held towards MMT, especially the public's perception towards transit. Informants stressed this barrier as having a large impact on MMT. Human nature can have a negative influence on attempting to create MMT strategies if there is no demand due to these negative perceptions. Within human
nature there is also social behaviour and car culture that does not support MMT initiatives or strategies. The public’s rejection of these MMT strategies due to preconceived perceptions, behaviour, and car culture all act as a barrier that will be explored. The human nature is acknowledged by informants even if they do not personally share these perceptions or behaviours.

4.5.5.1 Human Nature

Perceptions mentioned by informants are those which act as barriers towards MMT. A prominent perception that is mentioned is viewing money allocation to public transit as an expense rather than an investment. In comparison, money allocation for road projects are viewed as investments rather than expenses; this difference is seen in the choice of words individuals use. As Logan puts it, the “mindset around highway and highway support, they use the word ‘investment in highways’ they use the word ‘subsidy’ for transportation, and I want to use ‘investment’ for transportation and ‘subsidy’ for the highway because you’re subsidising trucking and subsidising personal transportation.” Elizabeth raises a similar observation that there is a misconception of transit being a subsidy when she thinks “that transportation is a public good that enables all the other services to a higher efficiency.” And that once that mindset shift happens the investments will be spent for the “public good knowing that it will save money in health care, and recreation, and culture, and connectedness.” (Elizabeth).

Logan mentions that most of the government “equate roads to votes and they equate roads to resident satisfaction”, which he believes should not occur. There is the perception that economic development takes up the bulk of the funding while in reality
transit can also be an economic driver where for “every 3 or 4 dollars invested in transit you have a return of 1 or 2 dollars” (Billy). When it comes to investing in solutions to transportation problems there is a perception that vehicles and more roads are the only solution which Billy argues will only continue causing traffic problems in the future since new roads will have their own congestion.

The perception of success is also problematic when it comes to transit, where success means “more people use transit, if it’s too successful and they have to put another bus out that’s greater cost to the tax payer,” (Westley) this definition being tricky where it can be seen negatively. “We just have to rethink how we define success for transit” (Westley). How transit and MMT is perceived also differs between communities and what their actions are towards transportation.

There are also social perceptions that act as a barrier to MMT strategies and implementations. Social perception is predominantly unfavourable towards transit, such as viewing transit as for the poor or believing in the status symbol of vehicles. If “people don’t change their minds about buses aren’t just how students and poor people get around.” (Elizabeth), it will not matter how many buses are placed on the street or if they run all the time. People also say that buses are empty, and Billy acknowledges that “the bus won’t always be filled, but it doesn’t mean people aren’t using it.” There is also the perception that buses are not accessible or convenient, and although it may not be convenient for everyone, Ron is adamant that the transit system is “probably a choice for a lot more people than people think because of that perception that it’s not convenient.”
Citizens also have concerns for safety, such as a perception of speeding in their community even when data collected shows no speed issues. However, “if there’s a perception that it’s unsafe, it’s still a real perception” (Mary) which can hinder MMT participation, such as children not being allowed to walk to and from school. Lighting is given as being a big issue or high-speed streets or highways. Mary stresses that it is important to create solutions for those who are not comfortable, and to make options more comfortable so people get on a bicycle instead of getting in their vehicle.

Changing the perception of the public is important but there is a barrier to do so, Mary mentions how social media has the ability to make things go viral. Mary faced a large outcry when attempting to upgrade streets and retrofit them to be more MMT friendly, people claimed that the road was being destroyed. Positive feedback was only being heard from the community after the couple of years it took to make the changes. Mary chalks it up to human nature, “the biggest obstacle, it would be [the] public. Public is huge. It’s just changes, right, human nature, a lot of people don’t like change, others they like the change.” There is also the perception that NB is different and “that won’t work” (Matilda) is said in arguments against proposed MMT solutions. Or there are “competing perspective where you have people that are coming from urban or rural northern New Brunswick and want that rural kind of life” (Billy) which, in their perception, often equates to more car centric mobility.

Barriers emerge when attempting to address behaviour, sometimes “you can’t get past human nature” (Meggie), even when behaviour stands in the way to MMT improvements and solutions. Logan experienced human nature barrier while
implementing MMT strategies, “we’re having to do an awful lot of work on changing people’s behaviour to take the bus and that piece is much harder than I anticipated.” There are those who know what they ought to do but do not act because MMT strategies are hard to implement and have unknown barriers to overcome. There are also those who voice their disagreement or desires for changes but do not act and “put his money where his mouth is” (Meggie).

When it comes to people, “humans are terrible at understanding the impact of today on tomorrow” (Matilda) when making decisions, which does not make NB any different from the rest of Canada. Habits are a hard thing to change, individuals have their transportation habits or are resigned to using their vehicle for transportation with a focus of getting from point A to point B. Or individuals are too complacent, and no one is volunteering to create MMT solutions by saying, “I’m kind of tired, I don’t want to do that someone else will and if not, oh well” (Meggie). Yet, there are those individuals who are not afraid to be ‘armchair engineers’ and make it difficult for staff members to convince the public that they know what they are talking about and that they can make transportation options better. It is difficult to change behaviours and make those arguments when vehicles are a dominant mode of transportation across NB. “There needs to be nudging, there needs to be the social marketing campaign” (Elizabeth) that will be examined in detail in a further barrier as to what is stopping those solutions from being implemented.
4.5.5.2 Car culture and dependency

There is a close relationship between people and their vehicles, Mary compares it to the close relationships people have with their iPhones. This attitude towards vehicles can be difficult to change, or the attitude that the issue is not transportation but instead parking a vehicle; regardless of how slow someone may be traveling, the focus is on parking. This is difficult for those making MMT Improvements because they are “trying to provide a service for you, not your car” (Mary).

When it comes to changing car culture, the informants see it as a change that has to occur generationally with a slight increase in demand in alternatives to vehicles in the younger generation; however, car culture still prevails. Car culture is noted as a big barrier to MMT strategies since “car culture trumps everything else so as long as we have the culture that doesn’t see to do [MMT strategies], we won’t for sure.” (Matilda). Arthur mentions that the lifestyle and culture here perpetuates car use since it is “the way they grew up, they’re used to driving” and that those moving into the province from other places bring the strategies they have seen in other cities and want it applied in NB communities.

There is a certain level of car dependency where people would like to not use their vehicles but have no other choice. Alternatives to a vehicle are not convenient and at times not available, where “if you don’t have that vehicle you’re stuck.” (Meggie). It is far easier to use a vehicle for transportation and certain policies are in place to encourage vehicle use, Arthur mentions that their bus pass is more expensive than a parking pass, something he points out as a big mistake. Unlike Toronto, there are no
difficulties in driving everywhere and finding parking. When changes are made to improve the system, it is impossible to satisfy everyone.

Unlike the earlier barrier of car culture, Matilda brings up an example that refutes the barrier as being a specific mindset of the community and more a function of the community, and the community is forcing individuals into a vehicle:

A group of Syrians' came here last year, they’re refugees, they arrived in Canada, they got a house, they had a little apartment that they rented for a while. The very first thing they wanted to get was a car because they had one in Syria, but they knew they couldn’t get anywhere without a car. They spent the first month trying to bus, trying to walk to places, figuring out where to go and they realized very quickly you need a vehicle, so these are people who have never lived here, do not speak English, know no one, can barely find the right food that they can cook on the grocery shelf and are keenly aware that they need a vehicle to survive. So, it’s not always ‘it’s just culture here in New Brunswick’, it’s a very real fact that people who don’t share our culture have also noticed. So, then you have folks who have a mode of transportation willingness to take transport to get where they need to go is pretty low, thereby reinforcing the fact that we don’t have a lot of people taking public transport, so you end up with a bit of a circle…

Although both behaviour and car dependency are mentioned, Matilda raises the point that the barrier is having a community too supportive of vehicle use, regardless of what people prefer or can afford. The reality of the physical environment and its perpetuation of vehicle use will be examined more in depth in another theme.

4.5.6 Theme six: Time and complexity barrier

The slow process of change is alluded to in the previous theme where changing car culture is thought of as a generational change. In this theme the barrier of change coming slowly will be examined in further detail. Barriers that come up during the
process phase are also mentioned within this section, this can be complexity, implementation, or growing pains. Within this section credibility and liability are also mentioned as they often take time to build and a lack of credibility and liability can act as a barrier.

4.5.6.1 Time and complexity

The time requirement for MMT strategies and implementations are mentioned as barriers. This can include the time required to address other barriers, such as changing mindsets and human nature. Mindset changes are incremental changes overtime which can take “two weeks or sometimes years for people to change” (Elizabeth). Working with people also takes time; however, working with people can be a ‘good time consumer’ and is not entirely or always a barrier.

Logan notes that when trying to work with people in the government, he had difficulties, it took a long time to speak with the right people and that “[provincial] government does not respond quickly”. It took Logan “four and a half years to get” onto the government agenda and be able to move forward with their MMT strategy. Meggie and her group dedicated ten years to getting MMT infrastructure from the government, specifically pedestrian infrastructure on a provincial road. The formation of a committee or a group can also take time, Elizabeth spent 2 and a half years helping a group to get to a point where they can provide a transit service. Elizabeth would like transit service implementation to be faster and easier for organizations to create community transportation services. Working with the public can also be time consuming, especially public education.
Implementing change takes time, solutions cannot happen overnight nor be implemented overnight, “you can’t just flip the switch” (Billy) if change is wanted. It can “take 6 months to 9 months to put that in place” (Billy) if a new service is wanted in the community, it can even “take many years” (Charles). Johnny mentions that some solutions won’t happen in the next 10 years, such as creating a new highway to provide a way to bypass a community and the traffic congested association with passing through. Some plans take years to implement because they are worked on slowly. Such as Johnny’s “eight-year plan for adding additional sidewalks”, especially since some locations are complicated and require more expensive implementation. Some projects take a lot longer to implement, such as twelve years to implement a roundabout, while a road conversion takes two years. Mary links the time requirement for implementing projects to the public and to “human nature”. Even improving the reliability and stability of a service takes time.

Changing policies and legislations is time consuming since “it’s interwoven into so many different areas in government” (Elizabeth). At the political level, regardless of the changing government, they have a five to six-year history of working on poverty, transportation being interwoven into this larger problem. Implementation takes time, as does creating plans. Mary mentions that their Active Transportation plan was revealed in 2002 but was not executed until 2010.

Matilda does not think that the time it takes for MMT projects, interventions, and strategies to be implemented make NB dramatically slow in comparison to other places in Canada. However, it can be difficult to have support for MMT strategies and
implementation when the benefits, such as health improvements, take a long time to see. “It’s [not] an easy sell for politicians to approve a million dollars to an organization like that that’s going to take years to see any benefits” (Ron), while investing money in hard infrastructure is quickly observable. It takes a long time to change habits and “it takes a lot longer to generate results in order to say, ‘hey, those millions of dollars I put into this organization 10 years ago, look at the results we’re reaping today. People are more fit’” (Ron) is not an easy sell in the political realm and “hard on the political sense to make those decisions” (Ron).

Ensuring that the implemented change is good and properly done requires taking the adequate time. Elizabeth gives an example of a project she worked on and how even with pressure to go fast, the project took time:

It was always taken on as a one-in-twenty-year exercise, there won’t be too many kicks to this can, so we should do it right and take the time, and there was pressure to get it out ASAP, but it was resisted, and I think the project is all the better for it.

When things require a dedication and a thorough and exhaustive approach it will take time, but Elizabeth makes it clear that time is needed. There are cases where policies are enacted very quickly in response to an unfortunate event, and these policies can be restrictive and resemble a knee jerk reaction instead of taking the time to produce an appropriate solution. Charles comments that some policies can also be created that are hard to implement and enforce after the fact, such as Ellen’s Law.

There are times when individuals are asking for a quicker implementation than what is realistic, everything requires time and resources. As Mary says, “you still have to
take baby steps to get there” even when there is a demand to go faster. Strategies have to grow organically, such as the volunteer driver program, where more driver than client is not ideal or the reverse. There are also changes that have to occur over generations, such as cultural changes. There are instances where informants noted that projects are taking longer than they had anticipated, such as Billy’s action plan, Logan getting people to try the new MMT service for the first time, or Meggie mentioning how they set money aside each year for projects such as bike paths. However, Billy is encouraged that MMT is something more communities are thinking about and working towards, but the interconnection between communities will take a lot longer when compared to MMT within a community.

4.5.6.2 Process

According to informants the process to implement MMT strategies is complicated. There are many moving parts and they all have to function well together and be in sync, and each municipality will have their own individual context and situation. However, strategies have to be sustainable as well as accessible, affordable, and available which is hard to get all points when often the choice to make is a “fast, quick, or cheap, pick two but you can’t pick [all] three” (Elizabeth) when attempting to implement a strategy. Transportation is complex and there are multiple aspects (e.g. engineering or infrastructure cost) that influence topics around transportation.

When attempting to create a complete street, it is a lot harder than simply repaving what already exist. There are multiple steps that are required, such as community consultation, examining existing traffic patterns, additional rules, what the
zoning looks like, and whether the law allows what the project hopes to accomplish.

Getting people more active through MMT is compared to smoking cessation, Matilda notes that there were 50 to 60 policy interventions to stop people from smoking. When it comes to these big issues Matilda says that

It’s cities, it’s provincial government, it’s individual people, it’s community groups, it’s all these people doing something different because there is no silver bullet for this stuff. I don’t know if the province had more leadership if this problem would evolve, or if we could change culture this problem would be solved, it’s all of it. It’s 20 or 30 different small things that gather for a change that’s necessary.

The process can be complicated when strategies are being implemented. Logan had to go through an extensive reporting process for his project, both in reporting money expenditure and receiving the funding. However, whenever a project or organization becomes “more complicated it will become more complicated” process at the administration level. Getting insurance is a problem another project faced; however, once that barrier to implementation was overcome, the same solution was available to other similar projects, so they did not face the same barrier.

There are factors within projects that complicate the system and the implementation, such as how volunteer driver programs calculate distance to reimburse (e.g. from the driver’s house or from the user’s house), or the contact between the public and services when a new project is implemented but people are unaware of how to use it. Sometimes a step is missing, such as a step missing for budgeting to ensure projects are being supported through their long-term vision, or the few recommendations completed from the Byrne Commission. Two systems exist but do not
line up, such as two separate transit systems with distant stops for transferring or the system is inflexible and creates timing problems since the two systems cannot work together successfully.

An entire project can also be implemented at the wrong time as Logan experienced, they missed an entire cohort who could have potentially benefited from the service by implementing their project after the college year began. Lastly, Johnny mentions another implementing barrier where the developers are “not always happy about” the enforcement of the community’s concepts to support MMT. Mary experienced a project to support cyclists that is not supported by cyclists, this highlights the need for balance, especially between new infrastructure, parking, and safety.

Logan emphasises the importance of an organization and individuals within an organization to be seen as having trust and credibility. These traits are critical in being able to talk to the correct individuals, have access to important but confidential information, as well as move on the next step of their group’s objectives of creating an MMT service. Credibility is very important during the exploratory stages, throughout funding and implementation since everyone in positions of power are “talking to each other, you have to be very conscious of what your credibility is and see the larger picture of what you’re doing at the different levels, it’s not isolated.” (Logan). When there is a lack of trust and credibility, certain stages in a project can take a lot longer, such as if a department or organizations is concerned that they may face legal ramifications.
Organizations wishing to implement MMT strategies have to learn “at the government level, what the roadblocks are, what are the difficulties, it’s learning what the needs are and doing the contracts, understanding the contracts, also looking at your own vulnerability” (Logan). It is not a simple process, and Meggie has stories of individuals losing their credibility and becoming a sour point for politically involved individuals who are less keen on helping now that someone has shown themselves as untrustworthy.

Liability is a grey barrier, as Mary notes, since there are always concerns of legal ramifications if a community decides to push the guidelines or regulations enacted. Pushing the boundaries alludes back to the thought that regulations and policies can be too restrictive, instead of allowing communities to properly address changing MMT needs and transportation trends.

4.5.7 Theme seven: Physical realities barrier

The physical realities theme is marked by existing hard infrastructure or topographical and weather constraints. These barriers are viewed as hard to change or costly to remediate. Some barriers within this theme are land ownership, auto-oriented development, density and distance, as well as weather and topography. Often times a sense of it-is-how-it-is is expressed during the interview in relation to these difficult barriers to overcome and barriers that have been present for many years, if not since the very beginning of exploring MMT strategies.
4.5.7.1 Auto-oriented development

How communities develop has the potential to impact modes of transportation. Land ownership is involved in community development and is mentioned by informants as a barrier to MMT. Johnny mentions that they want trails to connect between subdivisions, but land owners object to the addition. There are also times where development occurs outside of serviced areas, being a barrier to MMT strategies, specially where the new development does not lend to transit use. This development can occur within the community or outside the city on its peripheries, both resulting in areas with no access to transit. This barrier is amplified with large residential developments occurring on the peripheries of communities, developing auto-dependent areas that are “tough to provide good transportation options other than single automobile” (Arthur).

Mary notes that catering to MMT is complicated for those coming from outside of the community inwards since these facilities outside of communities are not supportive of MMT since there is “generally no pedestrian facility, no transit access” (Arthur). A lack of MMT facilities occur both outside and within communities, Westley notes that “there are a lot of areas in the city which were very much like rural areas in the sense that there’s no school next-door, you’ll still have to drive everywhere.” It becomes more desirable to live in the periphery communities due to lower cost and larger lots, but these are auto-oriented developments as well.

It is expensive to upgrade old infrastructure to be more bicycle friendly, to foster complete streets, and to change to the environment to be more supportive to MMT. A
barrier to MMT strategies is attempting to work with the old planning ideologies that have created the existing communities. Previous planning prioritizes the automobile, such as removing trams from communities so that a vehicle may move unimpeded. “The way we organized our communities in the past that we’re stuck with now” (Elizabeth) is appropriately said to summarize the fact that what is existing on the ground will not miraculously disappear and be replaced with the new planning ideology which may favour MMT. There is also the fact that how communities develop is reflective of what citizens desire, as Elizabeth says, “if you wanted to have hyper density you wouldn’t live here.” Density being a barrier mentioned by multiple informants.

Arthur believes that with low density MMT strategies can still be implemented, it just needs “to be more creative in terms of what the solution might be or what solutions might be.” But solutions may not be simple as “it probably requires more effort, for a lack of a better word, from people living in the rural areas to use other modes” (Arthur) beyond a personal vehicle. However, many informants nearly unanimously agree that density is required for MMT.

Often times case study communities are being compared to larger cities, such as Toronto, where density exists for MMT infrastructure. Nova Scotia is also given as an example of existing density allowing for MMT strategies and implementation, something mentioned as lacking in NB since “mass transit works where mass exists” (Westley). It is often boiled down to “proximity and density” (Elizabeth) as key to being able to have the options of walking, biking, or taking transit to a destination. Matilda highlights how
“we’re definitely more vehicle driven than other provinces for sure, but I think it’s almost a function of population density” as why NB has a large vehicle modal share. Again, NB is mentioned as having low density and being easy to commute via single occupant vehicles. There is mention of the high level of low density that exists in NB, a contrast to the density desired for MMT. There is low density within communities as well as outside of communities and on community fringes. As Arthur puts it:

The further you get away from the core, no question the harder or more challenging it is because you’re talking lower density, so whatever you do serves fewer people but is also a long distance so it also costs more so any cost you have serves fewer and fewer people.

Sprawl within a community makes it hard for people to justify the cost, the time requirements, and the distance that needs to be breached simply to access the service. While getting into a single occupant vehicle is simple and does not face high density issues, such as parking difficulties felt in cities such as Toronto. Even developments within city cores can perpetuate car dependency, Elizabeth raises the concern that municipalities can look at alternative solutions to building parking garages and instead have housing which would increase density in the core and make buses more viable. However, population density, or density in general are barriers.

Johnny says that they do not have any physical barriers but are waiting for population and “funding available to make that happen” for MMT strategies. Meggie says it is all relative, that “what is here is not the same as [Toronto] even though it sounds the same” when it comes to trying to address MMT barriers or being a councillor. Population density is problematic due to the scattering of development
throughout the province. Related to a lack of density is the barrier of distance that exist, these distances can be within communities, between communities, or due to topographical landmarks.

4.5.7.2 Topographic and weather

The two main physical geography or topographical constraints acting as barriers to MMT are large hills within a community or a woodlot dividing two communities. These barriers are found specifically within case study two and not mentioned in case study one. Arthur says that moving east west in the community is easier than north south due to a topographic barrier. Solutions to address the topographic barrier can be expensive, such as Charles proposing electric assist on bicycles which can “start around 8 or 900 dollars”. Ron acknowledges that having a “fairly flat community” is an advantage whereas it is harder in communities with lots of big hills.

Weather is mentioned as a barrier to MMT. As Elizabeth points out, unlike some places like Vancouver, NB has winter which can be a challenge. It is noted that cycling is a mode of transportation that cannot be done year-round in the communities examined in this research, “weather, majority or half of our calendar is cold and not user friendly for cycling, that is a big difference compared to Miami or anything south of New York.” (Liesel). The barriers examined within this theme are seemingly in existence and a reality that has to be worked around or accommodated for. However, there are still possibilities to adjust and create strategies, as Arthur mentions, to incorporate MMT in these existing communities with topographical and weather constraints.
4.5.8 Theme eight: Lack of knowledge and awareness barrier

The barrier examined in this theme is composed of a lack of knowledge, this is seen through either community members lack of knowledge or those in municipal and provincial positions. Further to a lack of knowledge, this theme also explores the lack of awareness through minimal MMT promotion.

Awareness and having information are important when making decisions for what is being implemented and how it impacts transportation. As Westley puts it, “we need to have informed decision making and we need to look as if it’s going to be the [department] wants to increase AT by paving shoulders of the road, they’re not going to benefit from that directly, New Brunswickers benefit.” However, this section highlights how a lack of information is a barrier to MMT decisions since an ‘informed decision’ is potentially not always occurring. Part of informed decision making is knowing what the transportation trends are. Westley gives an example where transit is provided, but the project failed due to a service not being compatible with individuals’ schedules due to a lack of understanding trends:

[public transit project], I was like ‘this is great, I can take the bus into work, it goes right into downtown’ and it got me there half an hour after work started. So, I could have told you right away that it wasn’t going to go but what did they do? The idea was to develop a service because we know seniors have challenges, people want to get to work, but that was conceptual knowledge. They knew that but they didn’t know what time people went to work or how many people are we talking about. Are we talking about the same 30 people that need transportation? We didn’t have that – smaller municipalities don’t always have the capacity to do that.
Multiple informants mention that a lack of understanding transportation trends is a barrier. Most communities rely on travel patterns to work as their basis of transportation information, not every community can create an in-depth review. No in-depth review exists from the province looking at provincial transportation trends. Mary mentions that the province lacks information and understanding of mobility since their focus has predominantly been on moving goods and people on highways.

Elizabeth and Ron both mention that a lack of technology leaves them with absent data, such as not having “the technology on all of our buses to know exactly where people are going” (Ron). But the main focus is a lack of understanding travel behaviour and how people “make decisions between things” (Westley) or what the “transportation needs are” (Westley). Some informants mention that they are still unsure if there is a MMT demand in their community, something requiring further examination. Sometimes a deeper understanding of what people are asking for is needed since sometimes what is being desired does not address the issue, such as what Westley experienced:

You may hear seniors saying, ‘I want a bus to go to the doctor’ but it may be because there are all these other factors and it may be that it’s only once a month that they go … If only ten people are going once a month that’s not necessarily enough to justify a bus service but, maybe it’s a volunteer program that does that.

People in communities know that there is a problem regarding transportation, but Westley feels that “people don’t know what to ask for”, as shown in the previous quote. They are asking for a bus, but they desire a method of transportation that meets their needs. Even those working within communities or the province sometimes lack
information beyond transportation trends, such as what a complete street is and how “a complete street is much better than a car community.” (Mary).

Informants describe a number of more specific nuances that there is a lack of knowledge, these include: municipalities not knowing where money is being allocated throughout the province by the provincial government, no method to inform community members of a multi-modal method to get to their destination, the cost of urban sprawl, the public is a barrier since they must be taught that providing transportation options is good and the public is not being forced into a mode they do not want to use. The urgency of climate change and how we need to make changes, policies for such things like paving shoulders on streets, and community members not understanding the mechanism of decision making. At times there can be “basic understanding but there’s a total disconnect between understanding it and having it fold into funding” (Logan) meaning other barriers are also potentially playing against MMT strategies and implementation.

4.5.8.1 Promotion

There are also barriers when attempting to address these areas of missing knowledge. Sometimes there lacks the space to provide information, such as not being able to provide information within the school system due to full teaching schedules, the fact that education is slow and can be difficult when it comes to the wider population or working on a one-by-one basis. Being able to promote is not always accessible to communities, but it is important since without promotion no one will know about the service, even if it is the best in the world.
The second barrier is raised by both Billy and Arthur and that is that they do not believe that their systems, such as transit and cycling, are complete and are viable options for people. Without a good service “at the end of the day it doesn’t matter how much you promote if you don’t have the infrastructure, it’s not going to do a whole lot of good.” (Arthur). Especially since promoting an alternative mode of transportation that is incomplete would be “basically telling [the public] to take an option that is less efficient for them.” (Billy).

4.5.9 Theme nine: Unexpected barrier

Unexpected barrier is alluded to by Charles but only two examples are mentioned by Matilda and Mary that can potentially fall within this theme. Matilda raises the language barrier where a French community may not communicate with an English community when collaboration could benefit both. She gives the example where a real barrier exists if a French individual is unable to read the pamphlet of an English community since bilingualism in organizations is not always mandated.

Mary has a surprising barrier which is more unexpected than Matilda’s, this is the fact that Mary, an individual who works in active transportation had been hit by a vehicle while cycling. This accident caused a delay of over a year for the implementation of the Multi-Modal Transportation plan. While other communities working with the plan were able to continue moving forward, Mary was one of the only people in her position which has an impact on implementation (not that Mary is solely to blame for the delay since it was beyond her control). These two examples are those which can be viewed as
unexpected, it may come as a surprise the level of impact the language barrier since the province is bilingual. Mary’s accident is unexpected and clearly fits within this theme.

4.6 Discussion

The informants feel that MMT is a good approach but not always an appropriate solution for the whole province of NB. The Province has transportation problems and MMT has the potential to be part of that solution and/or discussion. However, informants face barriers when attempting to implement MMT strategies. They may take comfort in knowing that the barriers they face are not always unique to their situation. As seen in section 4.3 there are multiple barriers that are mentioned by informants as well as present in the literature.

Discussion and information can potentially aid them in finding solutions together rather than individually. Some barriers, such as topography, are more prevalent in one case study, but a number of other barriers overlap communities or are not restrictive to the case studies. In such instance’s communities can focus on similar barriers, explore the causes. Whether similar solutions can be applied or if underlying causes are different and require different solutions. When barriers are not the same, it is still possible to communicate with different communities. Other communities may have successfully implemented similar strategies with no barriers. If the communities have worked on similar projects (with or without barriers) it may mean that they have knowledge on the topic and may provide guidance. If the two communities have similar projects, there may be underlying differences in both communities that may be causing
the problems (e.g. by-laws). Identifying the barriers may lead to a solution for the community facing the problem.

The barriers mentioned by informants are briefly summarized in Appendix J, hopefully as a potential discussion point between stakeholders in transportation.
5 Chapter Five: Recommendations

5.1 Barriers are multifaceted

The barriers that are hindering MMT strategies and implementation are not encapsulated in a single barrier, this is evident through the multiple barriers mentioned by informants and the stress placed on two particular barriers: human nature and funding. There are instances where a barrier crosses into another barrier, such as human nature and time requirements for change being individual barriers which are mentioned in each other, such as generational change to change behaviour takes time. Examining how barriers overlap and interlink is beyond the scope of this research, but it is a noted observation that occurred during both informant interviews and data analysis.

No one solution will fix all barriers which can be frustrating and complicated, as Meggie voices when speaking about MMT and creating change:

It’s a priority to me to get people out of their cars and stuff, how the heck are they going to do that and I can’t give them a solution to get out of their car and I can’t give them a bus because we can’t afford it, you know, that’s just when you’re banging your head against the wall.

Transportation is complex and solutions can also be complex or not readily available to the communities examined in this research. Just as barriers are multifaceted, so too are solutions. Matilda draws on a comparison to anti-smoking campaigns to highlight the multifaceted solutions required. A multitude of strategies from a number of different organizations, departments, and individuals are required. Matilda highlights the complexity when it comes to addressing MMT barriers and implementation for success.
What has worked in lowering smoking rates is have in the time that we have been working on smoking cessation is neither top down nor bottom up nor midway, it’s all of it, so if I want someone to stop smoking we have tried, I think around 50 or 60 policy intervention to get that person to not pick up their smoke. I think if we’re trying to change big societal things like climate change, like obesity, like improving the use of active transportation is all of it, it’s cities, it’s provincial government, it’s individual people, it’s community groups, it’s all these people doing something different because there is no silver bullet for this stuff. I don’t know if the province had more leadership if this problem would evolve or if we could change culture this problem would be solved, it’s all of it. It’s 20 or 30 different small things that gather for a change that’s necessary… there is no one solution for this, everyone has to have a solution and be part of that solution, what is it that different levels of government and different organizations can do to contribute to this today.

There is no one barrier that can be blamed for stopping MMT strategies and there is no one individual department or organization that can be expected to address the big problem of all these barriers. The multifaceted barriers and how they interlink means that addressing one barrier, such as increasing funding may not fix all barriers MMT strategies and implementations face, potentially human nature can still mean a high rate of vehicle use even with high investment in MMT. However, change has to begin somewhere, so this is not to say that nothing will ever improve, rather the contrary, like smoking cessation, solutions are out there.

5.2 Recommendations to address barriers

The following are high-level recommendations to address the barriers found in this research. These recommendations can be undertaken by employees or by a summer student or intern. The following are the high-level recommendations:
5.2.1 Theme one recommendation: Priorities

Provide documentation supporting MMT in the community or communities. This documentation could outline potential catalysts that may be predicted or currently impacting the city, such as large construction projects that disrupt traffic or yearly flooding. The documentation can include how MMT is beneficial and would address those potential upcoming disruptions to the community or communities. Secondly, a summer student or intern can create a document outlining potential champions, either in the community or communities, or in the organizations and department. Contacting these potential champions could begin an avenue for conversation of whether these individuals would be interested in being a champion for MMT.

5.2.2 Theme two recommendation: Intergovernmental and interdepartmental

Create a document outlining all organizations and departments that have an impact on transportation or are impacted by transportation, this document can include mandates and roles pertaining to MMT. If there are misunderstandings of mandates, the document could outline what an organization or department role is. Due to the documents ability to compare mandates, it can provide the opportunity to discover areas where there are missing mandates to support MMT.

5.2.3 Theme three recommendation: Political

Explore best practices and policies which support MMT. Include these MMT supportive policies when updating municipal plans, zoning or subdivision by-laws, secondary municipal plans, rural plans, and secondary rural plans.
5.2.4 Theme four recommendation: Funding

Some organizations should seek external funding for MMT projects. Summer students and interns, with guidance, can research and apply for the funding on behalf of the organizations. Departments can look at their current funding allocation and see whether improvements can be made to favour MMT.

5.2.5 Theme five recommendation: Human nature

Departments and organizations can collaborate to conduct community member-oriented projects to encourage MMT. This can be done through schools, such as incorporating bicycle safety courses for children as well as introducing the bus system. Community wide projects such as free bus fair to encourage bus use during events (e.g. Earth day, large disruptive construction projects), along with assistance to guide users though the process to make it easier to become familiar and comfortable with the bus system.

5.2.6 Theme six recommendation: Time and complexity

Allocate enough time when attempting to implement MMT projects. Provide a schedule outlining the time requirements and milestones for proper project management. Milestones will shift the focus from the overall time requirement to major progress points which highlight success throughout the project implementation phase(s).
5.2.7  **Theme seven recommendation: Physical realities**

Create a document outlining the hard and soft infrastructure barriers to MMT and how they can be mitigated, whether through adjusting upcoming projects to encompass MMT or recommend future MMT projects. Implement MMT best practices in projects to support MMT development.

5.2.8  **Theme eight recommendation: Lack knowledge and awareness**

Develop advertisement for MMT options in the community. This can be hosting events, creating pamphlets, apps, etc. Create information documents for organizations and departments to outline the role of MMT in communities and how organizations or departments can be involved in MMT as well as new MMT practices.

5.2.9  **Theme nine recommendation: Unexpected**

Be flexible for when unexpected barriers occur.

5.3  **Lessons learnt**

It is found that MMT is felt to be appropriate within the NB context; however, it is emphasised that MMT is successful where density exist. Although there are transportation issues in the province that need to be addressed, they require their own solutions that are the most appropriate for their context, such as a volunteer driver program or increasing density for a transit system. The near unanimous support for MMT may be more of a reflection of the informant’s employment or personal biases. However, it is unclear who is responsible for addressing transportation problems in the province. Some communities have municipal systems while others rely on volunteer
organizations. Although informants are in favour of MMT, it is unclear whether there is a need for it since, amongst the transportation issues that exist, there is a lack of demand. There is a high percentage of individuals who use a vehicle for transportation, primarily for work due to the source of data. It is unclear whether MMT strategies will be implemented if the barriers were eliminated.

The lessons learnt from this research are that there are a number of barriers that impede the implementation of MMT strategies in the two case studies. Furthermore, due to the informants speaking about LSDs and the province these barriers are felt beyond the scope of the two case study communities. Unfortunately, not one barrier can be blamed for impeding MMT strategy implementation. There is potential to require multiple solutions to be implemented by a wide array of individuals, organizations, and municipalities. Funding and human nature are the barriers most stressed during interviews; however, addressing these two barriers may not mean MMT strategies will be implemented. There requires further research into what the barriers are and what solutions have been successfully implemented. Overall, the findings of this research are in line with those discussed in the literature.

5.4 Limitations

There are a number of limitations within the research. There are two specific limitations regarding data collection, the first is the research being a limitation and the second is lacking anonymity. The data collection process potentially changed throughout the collection phase as the researcher grew more accustomed in conducting interviews. It is unknown whether this growth in the researcher’s ability to interview has
any impact on the data collected, the guiding questions are potentially able to reduce the risk of great variations between interviews; however, this is unknown. It is expected that interviews improved as they progressed and that if the researcher were to interview participants again the data collected would be more complete and of better quality. As shown in this research, data was collected and was analyzed in relation to existing literature on the topic of the research.

The researcher’s inability to ensure anonymity due to there being few people working in the field in the province has potentially caused informants to withhold sensitive data. The researcher also did not report information shared off-the-record due to its sensitivity and the inability to guarantee anonymity to the informant sharing the information. The researchers first-hand experience in the province further leads to the assumption that data may have been withheld, but no data can support or disprove this suspicion. For this reason, withheld data is being mentioned as a potential limitation to the study since it results in not all data being collected in relation to the research topic.

Lastly, a limitation of the study is the inclusion of LSD communities and the examination of the province as a whole. Informants spoke about MMT for communities as well as the province as a whole, at times including LSDs. This potentially undermines the case studies objectives of narrowing the scope of the research; however, the research findings may be more reflective of the reality of NB, which may make the final findings stronger. This limitation highlights that there is not a great divide between communities (LSD’s and municipalities) as previously believed due to their differing structure, function, and involvement related to transportation. However, the research
had not been designed to include LSDs, so informants within LSDs were not invited to the research due to inclusion criteria, even though of informants did speak on the topic without prompting.

5.5 Suggestions for future research

This research helps to explore barriers to implementing MMT strategies; however, the topic should be further explored. LSDs should be included in future research since they were discussed and should be appropriately represented by those in a position to speak on the districts. Future research could include a wider scope with more participants, so the findings represent more communities while also evaluating the rate different barriers present themselves and whether funding and human nature are still believed the biggest barriers. Future research could explore the rate each barrier occurs within communities or which barrier is perceived as having the most impact against implementing MMT strategies. These were not a point of focus for this research but could lend the research to further understandings of barriers.

Lastly, future research could examine how communities and organizations overcome barriers, or whether they were successful in overcoming barriers. This could provide more applicable findings, as it would give solutions to other communities struggling with similar problems. The applicability of other community solutions would have to be examined since there is conflicting findings where some informants believe NB is unique and require its own solutions while other informants perceive solutions that retrofitted solutions can be successful in the NB context. Future research would have to
explore these nuances when it comes to addressing the barriers that this research has explored.
REFERENCES


# Appendix A: Atlantic Provinces Density, Population, and Age

<table>
<thead>
<tr>
<th></th>
<th>New Brunswick</th>
<th>Nova Scotia</th>
<th>Prince Edward Island</th>
<th>Newfoundland and Labrador</th>
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<tr>
<td><strong>Population, 2016</strong></td>
<td>747,101</td>
<td>923,598</td>
<td>142,907</td>
<td>519,716</td>
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<td><strong>Population, 2011</strong></td>
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<td>921,727</td>
<td>140,20</td>
<td>514,536</td>
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<td><strong>Population percentage change, 2011 to 2016</strong></td>
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<td><strong>Population density per square kilometres</strong></td>
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<td>1.4</td>
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<td><strong>Land area in square kilometres</strong></td>
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<td>52,942.27</td>
<td>5,686.03</td>
<td>370,514.08</td>
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<td><strong>Median Age</strong></td>
<td>45.7</td>
<td>45.5</td>
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APPENDIX B: CASE STUDIES MAP

New Brunswick Case Studies
APPENDIX C: CASE STUDY ONE MAP

Case Study One
### APPENDIX E: CASE STUDIES DENSITY, POPULATION, AGE

<table>
<thead>
<tr>
<th></th>
<th>Moncton</th>
<th>Riverview</th>
<th>Dieppe</th>
<th>Fredericton</th>
<th>Hanwell</th>
<th>New Maryland</th>
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<tr>
<td>Population, 2016</td>
<td>71,889</td>
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<td>25,384</td>
<td>58,220</td>
<td>4,750</td>
<td>4,174</td>
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<tr>
<td>Population percentage change, 2011 to 2016</td>
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<td>2.8</td>
<td>8.9</td>
<td>3.6</td>
<td>0.2</td>
<td>-1.4</td>
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<tr>
<td>Population density per square kilometres</td>
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<td>554.8</td>
<td>469.6</td>
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<td>195.7</td>
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<td>54.05</td>
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<td>151.32</td>
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<tr>
<td>Median Age</td>
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APPENDIX F: LETTER OF INVITATION

Dear [respondents name],

The National Association of City Transportation Officials (NACTO) most recent publication they highlight Multimodal Streets as the means to serve the most users while ensuring safe, attractive, and convenient for those on foot, cycling, and transit. These streets provide access to all modes of transportation and shift the current trend of single occupancy vehicles to one that encourages the use of multimodal transportation: transit, walking, cycling, car-pooling, and park and ride. Statistics Canada highlights in their National Household Survey (2011) that New Brunswick has the second highest percentage of residents over 15 years of age commuting to work in a single-occupant vehicle, and some of the lowest rates of other modes of transportation.

Through the University of Guelph’s School of Environmental Design and Rural Development, an upcoming research initiative will be undertaken to understand barriers in integrating multimodal transportation in and between municipal communities in New Brunswick. Your organization has been identified as a possible participant in this research, demonstrating knowledge of the communities that will be examined. I would like to invite a representative, knowledgeable in the transit, walking, cycling, car-pooling, and/or park and ride of your organization, to participate in an interview at a time and place of most convenience to you.

The project is led by M.Sc. in Rural Planning and Development candidate, Isabelle Ouellette. The purpose of this research is to enhance the understanding the barriers to multimodal transportation in and between communities, and organizations roles in relation to encouraging different modes of transportation beyond single-occupant vehicles. The results of these interviews will contribute to a final report on the topic, which will be released publicly in the Summer 2018.

Please view the information letter for further information about the research. Your participation is voluntary, and you have the right to withdraw your consent to participation or your responses at any time. Organizations may be identified within the final report if necessary; personal identity will not be disclosed.

This project has been reviewed by the Research Ethics Board for compliance with deferral guidelines for research involving human participants. If you have question regarding your right and welfare as a research participant in this study (REB#17-06-029) please contact: Director, Research Ethics; University of Guelph; 519-824-4120 (ext. 56606).
Thank you for taking the time to read this research invitation. To confirm your participation, please contact myself via email (iouellet@uoguelph.ca) or phone (506-471-1555).

Sincerely,

Isabelle Ouellette
M.Sc Candidate

Wayne Caldwell
Faculty Supervisor
APPENDIX G: CONSENT FORM

[date consent form is sent]

You are invited to take part in the research project ‘Barriers to multimodal transportation in and between Municipalities within Greater Areas of New Brunswick’.

The purpose of this letter is to provide you with the information you require to make an informed decision about participating in this research.

Research Purpose

The purpose of the research is to explore the constraints to integrating multimodal transportation in New Brunswick within and between communities for greater areas. Secondly the study aims to evaluate municipal and provincial strategies for the integration and encouragement of multimodal transportation through a variety of strategies and/or policies. As well as examining the extent these strategies are being implemented.

Researchers

Principal Investigator: Dr. Wayne Caldwell, School of Environmental Design and Rural Development, University of Guelph, wcaldwel@uoguelph.ca, 519-824-4120 ext. 56420

Student Researcher: Isabelle Ouellette, M.Sc. candidate, Rural Planning and Development, School of Environmental Design and Rural Development, University of Guelph, iouellet@uoguelph.ca, 506-471-1555

Inclusion Criteria

You are receiving this notice because your organization has been identified as being associated with transportation and factors pertaining to transportation within New Brunswick.

Procedures

If you voluntarily agree to participate in this study, please do the following:

1. Sign and return this consent form to Isabelle Ouellette at iouellet@uoguelph.ca. If you have any outstanding questions you would like answered prior to agreeing to this interview, please contact Isabelle.

2. Provide a general timeline of availability. The research team will accommodate all time restrictions as best we can.
3. Allow between 45-60 minutes for the interview at this date. An in-person interview is preferred but it may be conducted over the phone if necessary. An audio recording of this conversation will be requested for future reference, but is an entirely optional component of the interview.

4. The interview will consist of 7-10 open-ended questions. Any of these questions can be skipped based on your level of comfort. A final copy of this research project will be provided.

Potential Benefits to the Multimodal Transportation

Participants will have the opportunity to contribute to and benefit from aiding the developing of understanding barriers to multimodal transportation within and between certain communities in New Brunswick. As a result, you will be promoting multimodal transportation, its benefits, barriers, and its potential within the Province.

Potential Risks

There is a potential risk that you may be identified by the comments you provide in the interview. The researchers will not collect any personal information and no comments will be attributed to you in final reports. Due to the small sample size, there is potential that people with knowledge of Transportation in New Brunswick may be able to identify you based on the comments provided. You can control this risk by not providing any information that you would be uncomfortable making public.

Participation and Withdrawal

Participation in this study is voluntary. You may refuse to participate, refuse to answer any questions, or withdraw from the study at any time with no effect on you. Should you chose to withdraw from the study, any information you provided will not be utilized in the study and the information provided will be destroyed.

Confidentiality

Due to the small number of people that have been invited to participate in this study it is not possible to provide confidentiality. The research will not collect any personal information. The research, and reports resulting from it, will not attribute of identity or organization to any comments. Given the small number of people invited to participate it may be possible for someone reading the report to identify respondents based on the type of comments provided.

In the unlikely event that confidential information regarding internal practices of multimodal transportation arises through the interview, the researchers will not record the information. Further, this information will not be utilized in any publication. If after the
interview, or at any time for two weeks’ post interview, you believe that confidential information was disclosed during the interview please contact Isabelle Ouellette (iouellet@uoguelph.ca, 506-471-1555) to have the information identified and removed.

Research Results

The results of the study will be included in Isabelle Ouellette’s major research paper as part of the requirements of the Masters of Science in Rural Planning and Development degree. The report, and a summary document, will be made available upon demand. It is anticipated the report will be available by August 2018.

Ethics Clearance

This project has been reviewed by the Research Ethics Board for compliance with federal guidelines for research involving human participants. If you have questions regarding your rights and welfare as a research participant in this study (REB# 17-06-029), please contact: Director, Research Ethics; University of Guelph; reb@uoguelph.ca; (519) 824-4120 (ext. 56606).

Signature of Participant

I have read the information provided for the study ‘Barriers to multimodal transportation in and between Municipalities within Greater Areas of New Brunswick’ as described. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

________________________________________
Name of Participant (please print)

________________________________________
Signature of Participant
APPENDIX H: INTERVIEW GUIDE

Thank you for taking the time out of your day to talk about multimodal transportation. In this case, multimodal transportation is referred to as moving people and goods in a means to support a more sustainable community. Multimodal transportation being composed of transit, vehicular, active transportation, rail, air travel etc.

1. What role does your organization/department hold in relation to multimodal transportation in the City of Moncton Greater Area, and/or the City of Fredericton Greater Area, and/or the Province for
   a. Within communities
   b. Between communities
   c. How long has your organization/department been involved in multimodal transportation?

2. What is your organization/department doing to increase multimodal transportation within and between communities?
   a. What challenges are impeding your ability to implement your strategies?

3. What further multimodal transportation initiatives might your organization/department take in the future?
   a. What is the timeline? Where will the initiatives be implemented?
      i. Prodding question: Are you aware of any standards and design guidelines to base your initiative from that can be applied to the location context?
      ii. Follow up question: Is there a lack of guidelines/standards flexibility when trying to implement new initiatives?
   b. How would your organization/department measure the impact of multimodal transportation?
      i. Prodding question: Do current performance measures for transportation (i.e. Level of Service, Traffic Impact Studies) impede multimodal transportation initiatives?
   c. What, if anything, is impeding this initiative?

4. What organizations or communities do you work with in relation to multimodal transportation?
a. Prodding question: Are different levels of government and different departments adequately coordinated to facilitate collaboration?

5. What do you believe are barriers to integrating multimodal transportation in and between communities for the City of Moncton Greater Area, and/or for the City of Fredericton Greater Area, and/or the province?

   a. Prodding question: Are funding and capital planning barriers to integrating multimodal transportation in and between communities?

   b. Prodding question: Are there policies or aspects of policies that are sources of barriers to integrating multimodal transportation in and between communities?

6. Do you believe multimodal transportation is appropriate for the New Brunswick context?

7. Have certain legislations and policies spurred action regarding multimodal transportation? And have other legislations and policies acted as barriers to multimodal transportation?

   a. Prodding question: has [relating policy or legislation to department, organization] been helpful?

8. What do you believe is causing people to not be more involved in multimodal transportation?

9. Is there anything you would like to add that we did not touch upon that you feel relevant to multimodal transportation in New Brunswick and/or for the City of Moncton Greater Area, and/or the City of Fredericton Greater Area, and/or the province?

10. Do you know of anyone else that would be useful to speak with regarding multimodal transportation in NB, particularly the City of Moncton Greater Area, and/or the City of Fredericton Greater Area, and/or the province?

    Thank you for your time. Once the study is completed the final report will be made available to you if you would like to view it.
### APPENDIX I: THEMES AND CODES BREAKDOWN

<table>
<thead>
<tr>
<th>Theme</th>
<th>Codes</th>
</tr>
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</table>
| **Priorities**                     | • No demand for MMT  
  • No social demand  
  • Not a priority  
  • Not a sexy topic  
  • Lack big picture mindset  
  • Lack a champion  
  • Municipalities will lead  
  • No catalyst |
| **Intergovernmental and interdepartmental** | • Mandates/jurisdictions  
  • Volunteer groups  
  • Silos  
  • Lack conversations  
  • Lack working together |
| **Politics**                       | • Politics  
  • Policies  
  • Reactive rather than proactive |
| **Funding**                        | • Lack funding  
  • Tax-base  
  • Lack resource  
  • Resource allocation  
  • Lack staffing  
  • Day to day  
  • Trade-offs |
| **Human nature**                   | • Perception  
  • Social behaviour/human nature  
  • Car dependency and culture |
| **Time and complexity**            | • It takes time  
  • Complex process  
  • Implementation  
  • Growing pains  
  • Trust and credibility  
  • Liability |
| **Physical realities of today**    | • Land ownership  
  • Auto-oriented development  
  • Density  
  • Population  
  • Distance  
  • Topography  
  • Weather |
<table>
<thead>
<tr>
<th>Theme</th>
<th>Codes</th>
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<tr>
<td>Lack knowledge and awareness</td>
<td>• Lack of information and education</td>
</tr>
<tr>
<td></td>
<td>• Lack promotion</td>
</tr>
<tr>
<td>Unexpected</td>
<td>• Expect the unexpected</td>
</tr>
</tbody>
</table>
APPENDIX J: SUMMARY HANDOUT

Barriers to Multi-Modal Transportation - Summary
Isabelle Ouellette
iouellet@uoguelph.ca
Advisor: Dr. Wayne Caldwell

In 2017, twelve key informants were interviewed to share the barriers they have faced when attempting to implement Multi-Modal Transportation strategies in two New Brunswick case studies and the province as a whole. The following is a summary of the nine themes that compose the barriers that key informants noted.

1 Priorities Barriers
Priorities barriers is a lack of balance between supply and demand which can be a barrier to implementing strategies. It was found that demand may exist, but the infrastructure or supply is lacking, making the automobile the only viable mode of transportation. Lack of demand for alternatives to the automobile is stressed by informants. There is currently a lack of public demand. There is also a lack of public or internal champions to push for MMT strategies. The largest barrier is lacking a catalyst to cause a demand, i.e. that climate change is not imminent enough to change behaviours, or parking or gas prices are not high enough to deter individuals from driving.

2 Intergovernmental and interdepartmental Barriers
Interdisciplinary barriers are the overlapping and underlapping responsibilities resulting from silos and a lack of a group or organization with the mandate for MMT. In certain cases, the public may mistakenly think a department or organization is responsible for providing a transportation service. It is not deemed and appropriate solution to placing the mandate on an already taxed organization or department. This barrier persists as those responsible for creating solutions may be reluctant if the monetary savings or benefits are not seen within their department.

3 Political Barriers
Political barriers are prevalent when it involves policy making or monetary spending. Decision making in politics is problematic without public demand. Trade-offs have to occur as politicians allocate funds and make hard decisions. Often times policies are reactive rather than proactive.

4 Funding Barriers
Funding barriers is one of the biggest barriers. Implementing strategies and infrastructure is expensive and can become difficult if a community has a small tax base. Communities may want to co-fund a project with departments or organizations but if denied it may result in the community having to fund the entire cost. Some informants mentioned that there is adequate funding, but it needs to be reallocated and restricted to support long term visions. A lack of resources, such as overburdened staff, may be alleviated through funding.
5 Human Nature Barriers
Human nature barriers is the second most stressed barrier. How individuals perceive MMT can have a negative impact on strategies. Social behaviour and car culture are strongly supportive of the status quo of using automobiles. Changing opinions and behaviours can be difficult and take a long time. Although most informants say that car oriented is a construct of culture, anecdotal story tells of refugees being keenly aware of the need for a vehicle in the community. Those living in the communities may not desire high density which is an aspect that supports MMT strategies.

6 Time and Complexity Barriers
Time and complexity barriers can result from strategies being complex compared to repaving what currently exist and more has to be done when reconstructing a road to be a complete street. Those attempting to implement strategies have a hard time reaching the correct people for vital discussions. Projects require a lot of time; some take years to get onto a government agenda, and it took 10 years to have pedestrian infrastructure added in a community. When a project is agreed upon and is moving forward it cannot be implemented overnight and can take months or years of work before progress is seen in the public. Human nature is noted as a slow generational shift.

7 Physical Realities Barriers
Physical realities barriers stem from how a community develops and its impact on transportation. Low density can make destinations far apart and does not lend well to modes of transportation other than personal automobiles. Existing infrastructure can be problematic when attempting to create MMT strategies because they require retrofitting. Auto-oriented development still occurs leading distance and lack of density to act as barriers to MMT. Weather and topographic constraints are also problematic. Large hills and winter can make cycling a seasonal mode of transportation or unrealistic for many in the community.

8 Lack Knowledge and Awareness Barriers
Lacking knowledge and awareness barriers is seen through MMT being a new concept in some communities and departments. Higher level of government is not always versed in modes of transportation beyond freight and automobiles. Community members can lack knowledge of what exist and how current services can be utilized — such as using public transit. A lack of awareness is often due to low service promotion. Promotion can be difficult when the service is not complete and may be less efficient than a personal automobile.

9 Unexpected Barriers
Unexpected barriers can arise at times and can delay a project. Some barriers may be known but the delay can be beyond what was anticipated.

A copy of the completed thesis is available upon request.
# APPENDIX K: OVERVIEW OF THEMES IN LITERATURE

<table>
<thead>
<tr>
<th>Theme</th>
<th>Present in literature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Priorities</td>
<td>No</td>
</tr>
<tr>
<td>Intergovernmental and interdepartmental</td>
<td>Yes</td>
</tr>
<tr>
<td>Political</td>
<td>Yes</td>
</tr>
<tr>
<td>Funding</td>
<td>Yes</td>
</tr>
<tr>
<td>Human nature</td>
<td>Yes</td>
</tr>
<tr>
<td>Time and complexity</td>
<td>No</td>
</tr>
<tr>
<td>Physical realities of today</td>
<td>Yes, but does not mention density</td>
</tr>
<tr>
<td>Lack knowledge and awareness</td>
<td>Yes</td>
</tr>
<tr>
<td>Unexpected</td>
<td>No</td>
</tr>
</tbody>
</table>