EXPLORING THE PAST 70 YEARS OF TRANSPORTATION PLANNING TOOLS AND PRACTICES AMONG SELECT NEW BRUNSWICK CITIES: ARE WE READY FOR THE FUTURE?

Trevor Hanson, University of New Brunswick

Proceedings of the 52nd Annual Conference
Canadian Transportation Research Forum

1 Introduction

Modern transportation planning dawned in New Brunswick in 1946 with the release of the "Master Plan of the Municipality of the City and County of Saint John, NB, Canada" at the time the 12th largest metropolitan area in Canada. This plan, authored by J. Campbell Merrett, was developed in anticipation of population growth, growth in automobile ownership and desire for modern housing in Saint John, trends which were all experienced in cities across North America over the coming decades. This plan, and others, ushered in an era of large scale highway investments that changed the complexion of New Brunswick's largest cities throughout the 1960s through the 1980s. These projects were initially informed through transportation planning practice that focused on projecting vehicular traffic on a road network, typically within a municipal environment, with transit relegated to a social service role. More recent transportation planning efforts in New Brunswick's largest cities have expanded the focus to include transit and active transportation, though the legacy of the highway megaprojects continues to shape urban mobility in New Brunswick.

This paper briefly explores the progression of transportation planning in New Brunswick's three largest urban areas (Saint John, Greater Moncton (Moncton, Riverview and Dieppe) and Fredericton) through a review of historic plans retained at the Harriet Irving Library at the University of New Brunswick. More recent plans were sourced online from municipal websites. The plans were reviewed chronologically in terms of their overall vision, technical approach, and contributing legacy to urban mobility in New Brunswick. Plans are compared and contrasted and a final commentary provided based on the perceived ability of New Brunswick cities to leverage transportation planning tools to address present and future challenges for continued reliance on car-centric mobility, such as an aging population and climate change.

2 A vision for metropolitan highways begins in Saint John (1946)

"It is safe to assume that these plans are not the last work. The last word will never be said in Town Planning." John Flood, Chair, Saint John Town Planning Commission, 1946 in Merrett (1946)

In 1941, metropolitan Saint John was the 12th largest metropolitan area in Canada, with a population 65,784. The City itself had a population of 51,741 making it more than twice the size of the second largest city in New Brunswick, Moncton, and five times larger than the capital city of Fredericton (Statistics Canada, 1951). Its ice-free harbour and ocean access historically made the city an attractive location for industrial

development. In 1946, the Saint John Town Planning Commission released its "Master Plan of the Municipality of the City and County of Saint John, NB, Canada" also known as "New Life for Canada's Oldest City" authored by J. Campbell Merrett (1946). This document states it was built on at least two earlier attempts to plan Saint John in 1922 and 1936, and was driven in part by a sense of urgency to accommodate the housing needs of soldiers returning from WWII. Saint John of 1946 had commuter rail, streetcars, transit and intercity bus service, and a harbour ferry, yet according to Merrett (1946) was also dealing with a "lack of desirable living conditions in the urban area" (p. 26) and car traffic circulation issues due to a "single route system" with only one east-west road route through the City.

The crux of the traffic and circulation component of the Saint John plan of 1946 was to improve the mobility and flow of automobiles (Figure 1). This was to be accomplished in two ways as described in Merrett (1946): first, to remove the streetcars which were delaying motorists (p. 66); second, the construction of an alternative to the "single route system". There were two main components to develop an alternative to the single route system. First, a highway bypass proposed north of the Reversing Falls ("Western Approach Highway") to serve through traffic, in concert with a Harbour Bridge south of the Reversing Falls to serve local traffic.

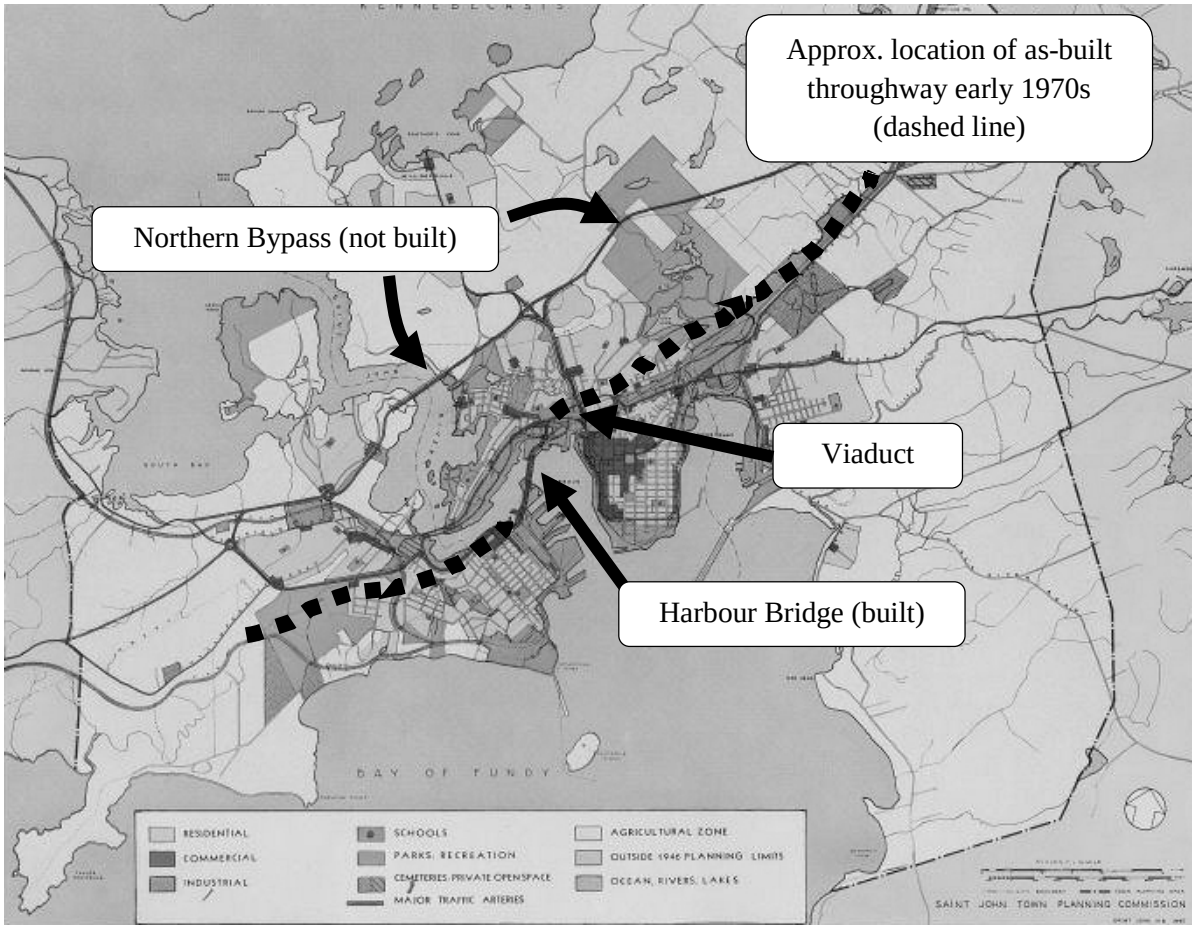

Figure 1: Transportation & land use plan from the 1946 Saint John plan modified from New Brunswick Museum (2017)

Second, the construction of a viaduct to provide grade separation for the single route system from Main Street to the CBD over a set of busy rail tracks. Both components would also facilitate the removal of substandard housing, as indicated in the plan. While travel demand modelling did not exist at the time, the Commission based its recommendations from a 2 hour traffic count, review of collision data from 1945, and a comparison of traffic counts from 1936 and 1945 across a major rail grade crossing. There were no metrics for contextualizing results, such as Level of Service, and no quantitative predictions for future volumes.

3 Saint John puts 1946 vision into practice, uses desire lines to site harbour bridge (early 1960s)

By the early 1960s, Saint John was moving forward on the major transportation recommendations from the 1946 plan, with some major modifications. An origin-destination survey in 1963 by FENCO as part of a travel demand modelling exercise found only 9% of projected traffic on the highway system to be through traffic, with desire lines showing the majority of desired local travel to be on a bridge south of the Reversing Falls (Foundation of Canada Engineering Corporation, 1963). The result was a scuttling of the northern bypass option, with a Harbour Bridge plan expanded to a Throughway Complex in 1964 to serve both local and through traffic, while incorporating a new viaduct (Foundation of Canada Engineering Corporation, 1964). The 1963 FENCO study also produced population projections and growth factors, which based on previous growth rates, suggested a city population of approximately 160,000 by 1983, though the population actually dropped from 90,000 to 70,000 between 1961 and 2006 (Statistics Canada, 2012a). Transit and other modes were not considered in any of the modelling efforts.

The throughway complex coincided with urban renewal schemes in the city that saw much of the deficient housing cleared to make way for the highway, resulting in the displacement of thousands of residents. Marquis (2010) notes that there was no "freeway revolt" in Saint John that resulted in cancelled projects in Toronto and New York, for example, though there was expressed concerned by a "citizens committee" that areas would be cut off from the CBD, industry would be blocked from the waterfront, and property values would be lowered.

4 Other New Brunswick cities begin transportation planning as part of larger municipal planning reform (1968-1974)

The late 1960s and early 1970s saw the development of at least three metropolitan transportation planning exercises in New Brunswick involving Saint John (1968), Moncton (1972), and Fredericton (1966, 1974). The 1960s was a period of considerable change in New Brunswick, with many functions (such as education) moved from municipal or county responsibility to provincial responsibility to address the considerable inequity in service provision at the time. The New Brunswick Community Planning Act, renamed and expanded from previous legislation in 1961, allowed for municipalities to establish planning commissions and provided for the creation of district planning commissions[i]. The wording of the Community Planning Act with respect to transportation was broad, with only a requirement to develop policies. Though the legislation was not prescriptive, there were similarities in how each of the largest municipalities approached their transportation planning, primarily shaped by predetermined large-scale ring road or throughway concepts.

4.1 Saint John employs three-step demand modelling for its road network as throughway nears completion (1968)

Saint John, being the largest city, and having completed several other transportation studies in succession, completed its report in May 1968, a few months prior to the completion of the Harbour Bridge in August, though the models did not account for the bridge or throughway in their network. The "Comprehensive Community Plan" spanned several volumes, including land use plan documents and transportation planning documents (Proctor Redfern Bousfield and Bacon, Read Voorhees and Associates, & Town Planning Commission of Metropolitan Saint John, 1967). The approach to transportation planning was an even more in-depth and sophisticated approach to travel demand modelling as in the 1963 report, though it did so based upon a similar methodology of measuring the number of trips between origin and destination zones. The documentation for the 1968 plan was more explicit in terms of outlining specific approaches and methodologies. The report describes only three steps (trip generation, assignment, distribution) of standard modelling practice known as "four step modelling", excluding the modal split step.

4.2 Moncton looks regionally to model future vehicle demand on proposed highway network (1972)

The 20 year Greater Moncton Metropolitan Plan (Wilbur et al., 1972) was completed in 1972 and included a comprehensive transportation plan that was geographically broader in scope than the Saint John plan and included seven municipalities. The population of the study area was 76,250 (68,350 within the urban agglomeration) forecasting a metropolitan population of 127,750 by 1992. This population level was not reached until 2006 (Statistics Canada, 2012b). Unlike Saint John, the actual population did eventually match the forecasted population. The study purpose appeared to be broader than the Saint John plan as well, with the examination of the transportation system including road and rail systems, parking in the central urban area, and public transportation. Similar to the Saint John plan, the Moncton plan included a forecast of future travel demand and system requirements informed through the development of transportation models. The methodology appears identical to that of the Saint John plan, and given the Moncton plan employed a different consulting group, suggests that the methodology was more a function of standard practice by this time.

The plan notes that four major highway improvement projects were being planned and designed at this time including: Wheeler Boulevard (a ring road); Shediac Highway (four lane highway connecting downtown Moncton, Wheeler Boulevard, and Shediac); Halls Creek Interchange (to connect Wheeler and the Shediac Highway); and a realignment of the Trans-Canada Highway. The plan notes that these facilities were considered as conceptual inputs to the transportation planning process, and that the traffic demands outlined in the report were used to justify functional plans and design standards of these facilities. Most of the projects were eventually built, though not exactly as outlined in the plan, and a second causeway was not built (Figure 2). The plan did identify a number of transportation deficiencies that were not exclusively vehicle related, including vehicle-pedestrian conflicts in the central business district, and "minimal public transportation service".

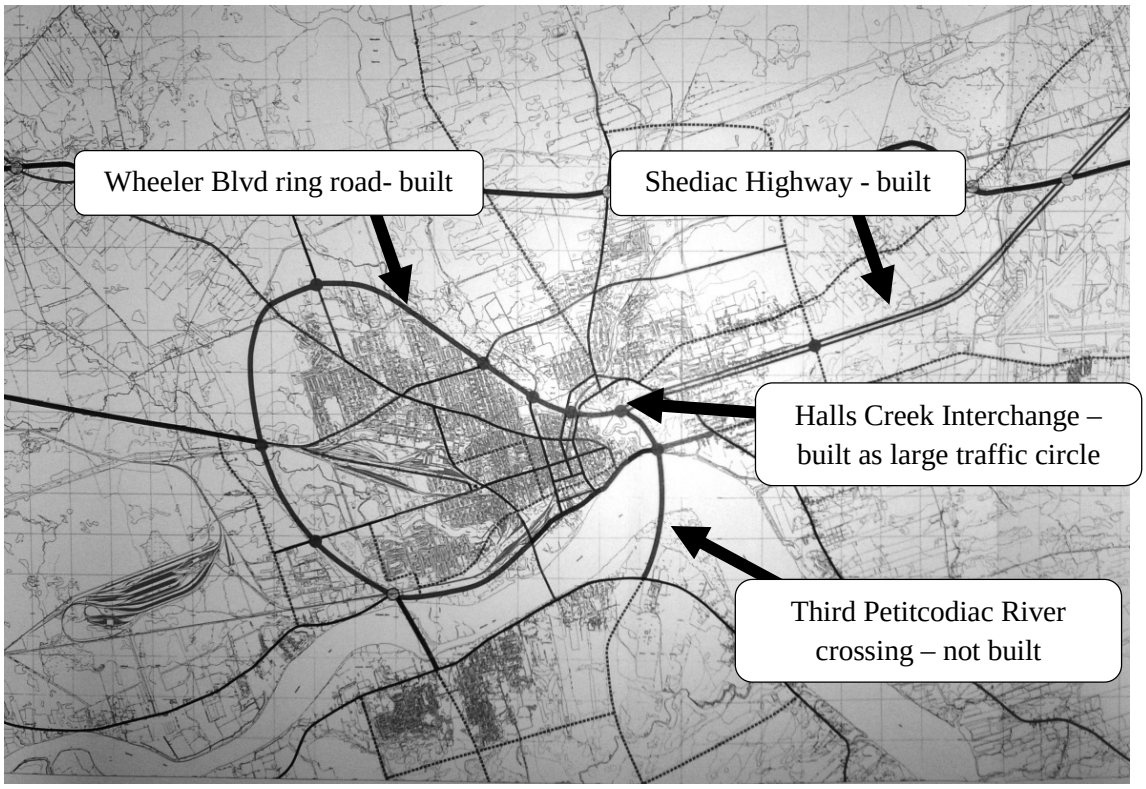

Figure 2: Road network from Greater Moncton Metropolitan Plan (Wilbur et al., 1972)

4.3 Fredericton prepares for amalgamation by modelling highway network with three-step process (1966-1974)

In 1974, ADI Limited prepared a Transportation Background Study for the Capital Area Comprehensive Plans (Fredericton) (ADI Limited, 1974). It was preceded by several studies including the City of Fredericton and Metropolitan Area Major Traffic Plan (1966 – 86 – Cameron Grant and Associates), Fredericton and Area Urban Renewal Study, City of Fredericton Urban Renewal Scheme (1970 – the Marshall Macklin Monaghan Report), and a Capital District Planning Commission Information Survey (1972 – UNB Department of Civil Engineering). The purpose of the latter study was to catalogue the planning data for the Greater Fredericton Area in anticipation of an upcoming comprehensive plan, which was ultimately completed by ADI Limited in 1974.

The 1968 and 1970 studies primarily focused on data assembly for Greater Fredericton, including patterns of households, occupational characteristics, and family income. Detailed travel demand modelling in Fredericton does not appear to be a consideration prior to this time, likely because the City was small enough (19,683 in 1961, 24,254 in 1971 (Statistics Canada, 1971)) that automobile traffic congestion and large scale industrial growth were not motivating factors as they were in Saint John. It should be noted that in 1970, the boundaries of the City of Fredericton were limited to the south side of the river, with “Greater” Fredericton including many communities on the north side of the river that would become part of the City in 1973, effectively doubling the population. The 1974 plan was developed to encompass this newly amalgamated region, with one the major recommendations being the construction of a new highway bridge to connect the north side to the Central Business District.

The ADI Limited (1974) plan notes that the location for the new bridge [the Westmorland St. Bridge] had already been chosen by the New Brunswick Department of Highways, and that the location was "not as close to the centroid of present traffic demand as most desirable but appears to be satisfactory" (p. 4). The ADI plan included discussions about intercity bus and public transit, and made calls for improved passenger terminals in the CBD. The plan also included a traffic model, which like Saint John and Moncton, used a three-step modelling approach (neglecting the modal split).

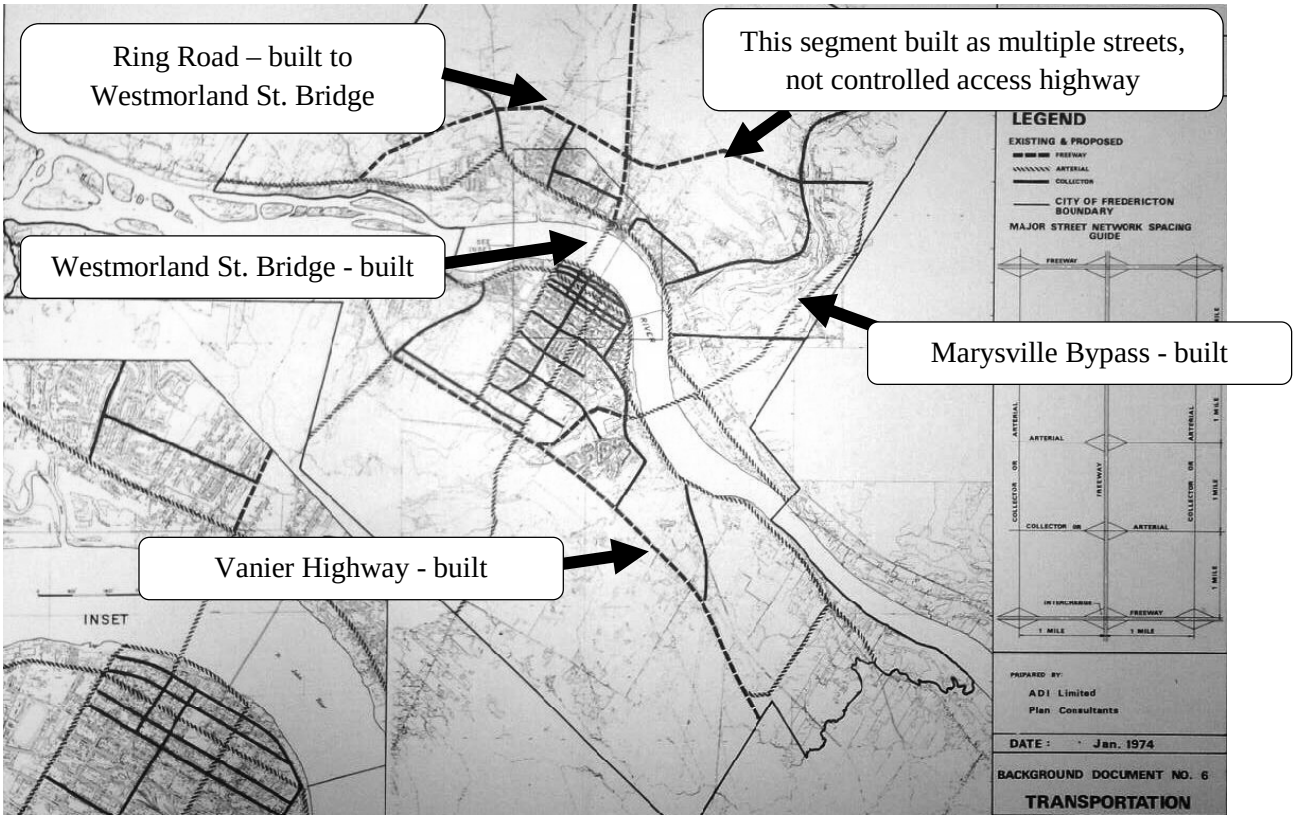

Figure 3: Fredericton transportation plan from 1974 (ADI Limited, 1974)

4.4 Metropolitan plans set the stage for municipal adoption of private sector transit services as public good (late 1960s, early 1970s)

While four-step modelling was an accepted practice at this time, transit mode split was not a consideration in any of the profiled New Brunswick metropolitan transportation plans at the time. The Saint John plan of 1968 did not appear to have an explicit mention of public transportation, instead focused on road network improvements. The Greater Moncton plan did mention transit, though recommendations appear to be policy-based (e.g. public ownership of the system, increasing coverage, testing new concepts, increasing per capita ridership), rather than a technical evaluation of any of the existing or prospective routes. Like Greater Moncton, the discussion of transit in Fredericton was guided by a philosophy that anyone who could obtain a private automobile would do so. Young people, older persons, persons with a disability, and economically disadvantaged people would "have no economical means of transportation" if transit were abandoned (ADI Limited, 1974), a course of action that the private company was considering as it had not made a profit on the service for the previous 5 years. Similar to the Moncton plan of the same timeframe,

there did not appear to be any data collection initiatives similar in size and scope to that could be used to predict or forecast transit demand. Rather, there was a focus on a number of policy initiatives, including the construction of an improved transit terminal, though not supported by data collection.

5 New Brunswick metropolitan transportation planning continues to be shaped by legacy decisions, but focus expands to active transportation and transit (present day)

While there have been other transportation studies between the 1970s and present day, a snapshot of current practices provides some valuable insights into how those historic practices have been incorporated into present practices.

In 2012, the City of Saint John released its municipal plan supported by technical background report by ADI Limited (2010b). The transportation part of the technical report is initially focused on automobile traffic patterns and where the most sophisticated analysis exists, though there is a greater profile for transit in this document when compared to the 1968 plan, profiling routes, system performance as well as notable initiatives regarding express service. The ADI Limited (2010b) report also reintroduces, for future consideration, modes of transportation that disappeared following the 1946 plan, including commuter rail and a harbour ferry shuttle (p. 237). There is currently a new planning effort underway which has included origin-destination surveys of those outside the city as well, which is expected to include an even greater focus on transit and active transportation (Canadian Broadcasting Corporation, 2015).

In 2015, the three communities that comprise Greater Moncton (City of Moncton, City of Dieppe, Town of Riverview) completed an extensive transportation planning exercise called “Destination 2040” (HDR Inc., 2015). Like the 1972 Moncton Plan the heart of the plan is origin-destination information from internal and external zones to support four-step modelling, but now includes modal split targets for transit (from 1% in 2013 to 7% by 2041), increased focus on active transportation, and on “managed demand”. Highway and road capacities still dominate the technical analysis (as vehicles remain the most popular choice), but of the 18 priorities and actions, nine relate to active transportation and transit.

In 2010, ADI Limited (now exp) prepared a Capital City traffic update for Fredericton (ADI Limited, 2010a). The limits of the study were the City municipal boundaries. The main focus was on vehicle volumes and commuter traffic, while passenger transportation by public transit, intercity bus, ferries, park-and-ride, etc, were excluded at the time. Fredericton has been moving forward on numerous active transportation initiatives, most recently a report on connecting the gaps in the active transportation system (Parsons, 2017), and maintains an extensive multi-use trail system.

6 Commentary: is New Brunswick well-positioned to address future transportation needs?

The common thread among transportation planning in the largest New Brunswick cities was employing processes to understand the anticipated impacts of major highway infrastructure projects conceived in an era of rapid population growth, suburbanization, and increased desire for automobile travel. New Brunswick is well-positioned to address future transportation needs if the automobile can remain the main enabler of personal mobility. The challenge is that today New Brunswick is defined by an era of an aging population, outmigration, and larger environmental forces that can work to make car dependence less

feasible over time. While New Brunswick cities have embraced planning for active transportation and transit, decision-makers are still faced with comparing clearly quantified and articulated benefits of highway improvements with generally more conceptually-based recommendations relating to transit and active transportation where supporting data are limited.

Moving forward, New Brunswick cities and surrounding regions may need to articulate a vision for active and shared transportation improvements as a "conceptual input" to a planning process, rather than relying on the planning process itself to produce these improvements as outputs. Enacting a vision for a system of shared transportation and transit and funding them beyond historic views of their recreational and social service roles, respectively, would better position New Brunswickers to pivot to these modes over time. Forecasting detailed usage of those modes may require employing a new transportation planning modelling method, such as activity-based modelling, to test more conceptual ideas for reducing automobile dependence. The challenge is that models based on this approach are more complex, expensive, data intensive, and not as widespread in practice as the four-step. Further to the needs in cities, the transportation needs of rural areas are not clearly understood in New Brunswick given they do not yet fall under any regional transportation planning framework or included in existing city planning exercises. These areas are the most rapidly aging and have fewest alternatives to driving oneself in an automobile.

7 References

ADI Limited. (1974). *Capital area comprehensive plans : technical background study*.

ADI Limited. (2010a). *Capital City Traffic Study Update*. Retrieved from www.fredericton.ca/sites/.../finalreport_capitalcitytrafficstudyupdate_20100323.pdf

ADI Limited. (2010b). *City of Saint John, Saint John Growth & Change Strategy and Municipal Plan, Final Technical Background Report*. Retrieved from Saint John, NB: http://www.saintjohn.ca/en/home/cityhall/developmentgrowth/communityplanning/plansj/backgroundstudies.aspx

Canadian Broadcasting Corporation. (2015). Move SJ plans future of transportation in Saint John. Retrieved from http://www.cbc.ca/news/canada/new-brunswick/move-sj-plans-future-of-transportation-in-saint-john-1.3115327

Foundation of Canada Engineering Corporation, L. (1963). *Feasibility report, to the Harbour Bridge Authority for the City of Saint John, New Brunswick, on a harbour bridge*. Toronto.

Foundation of Canada Engineering Corporation, L. (1964). *Report to the Bridge-Throughway Complex Committee for Metropolitan Saint John, New Brunswick, on a bridge-throughway complex*. Toronto.

HDR Inc. (2015). *Regional Sustainable Transportation Master Plan* Retrieved from https://www.moncton.ca/Assets/Residents+English/.../destination2040finalreport.pdf

Marquis, G. (2010). Uneven Renaissance: Urban Development in Saint John, 1955-1976. *Journal of New Brunswick Studies/Revue d'études sur le Nouveau-Brunswick, 1*.

Merrett, J. C. (1946). *New life for Canada's oldest city : a plan for Saint John : a report*. Saint John, N.B.: Town Planning Commission of Metropolitan Saint John,.

New Brunswick Museum. (2017). Greater Saint John 1946, Accession number 1988.36.2. Retrieved from http://website.nbm-mnb.ca/Transition/English/details.asp?item=1217

Parsons. (2017). *City of Fredericton Active Transportation Connection Plan*. Retrieved from http://www.fredericton.ca/sites/default/files/roads-parking/city_of_fredericton_active_transportation_connection_plan_smaller_e-mail_size.pdf

Proctor Redfern Bousfield and Bacon, Read Voorhees and Associates, & Town Planning Commission of Metropolitan Saint John. (1967). *Comprehensive community plan, Saint John, New Brunswick*. Toronto.

Statistics Canada. (1951). *Incorporated Cities, Towns and Villages having Populations of Over 1,000, by Provinces, Census 1951 compared with 1941*. Ottawa Retrieved from http://www66.statcan.gc.ca/eng/1952-53/195201840132_p.%20132.pdf.

Statistics Canada. (1971). *1971 Census of Canada Population Census Subdivisions Catalogue 92-702 Vol 1 Part 1*. Ottawa.

Statistics Canada. (2012a). *Focus on Geography Series, 2011 Census, Catalogue no. 98-310-XWE2011004*. Ottawa Retrieved from http://www12.statcan.gc.ca/census-recensement/2011/as-sa/fogs-spg/Facts-cma-eng.cfm?LANG=Eng&GK=CMA&GC=310.

Statistics Canada. (2012b). *Visual Census. 2011 Census*. Ottawa Retrieved from https://www12.statcan.gc.ca/census-recensement/2011/dp-pd/vc-rv/index.cfm?Lang=ENG&VIEW=D&CFORMAT=jpg&GEOCODE=305&TOPIC_ID=1.

Wilbur, S., Associates, Moncton, Town Planning, C., Sunderland, P. S., & Associates. (1972). *A transportation plan for the Greater Moncton metropolitan area : prepared for the town planning commission of the Metropolitan area of Greater Moncton*.

[i] Note: the original source of the document from the New Brunswick Department of Local Government is no longer available. Original URL is: http://www.gnb.ca/cnb/promos/flg/PDF/MainReport/mainreportchapter9-e.pdf

Type of Paper: Regular