

A Tale of Two (Mid-Sized) Cities
Analysis of External Factors Affecting Transit Ridership in
The City of Kingston and Region of Waterloo

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

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Abstract

This thesis evaluates how municipal transit ridership in mid-sized cities is influenced by external factors. External factors are forces outside a municipality's direct control but potentially affect the municipality in some way, in particular its transit ridership. The thesis also determines the appropriateness of municipal levels of response to each factor. Two mid-sized municipalities in Ontario, Canada – the City of Kingston and Region of Waterloo – were studied.

The evaluation, first, identifies the trends or “current conditions” between the municipalities and five sets of external factors to determine influence on ridership. The factors are 1. Population Growth and Density; 2. Demographics (Seniors, Students and Immigrants); 3. Regional Location; 4. Federal/Provincial Impacts; and 5. Fuel Prices.

Second, the municipality's level of response was measured in three ways. Staff awareness of the factor and its influence was gauged using key informant interviews and municipal councillor surveys conducted by the researcher. Internal policy and guidance documents measured whether policies relating to each factor are appropriate. Finally, observations of implemented initiatives determined whether they appropriately deal with each factor.

The study finds that more external factors act on Waterloo than Kingston. Therefore, Waterloo has strong incentives to prioritize – among many municipal responsibilities – its transit system and to focus on increasing ridership. The strongest incentives for Waterloo are population growth, the student demographic and federal/provincial impacts. Kingston has only one strong incentive: the senior demographic. The study also finds that Waterloo has appropriate levels of response to more of the external factors than does Kingston. Recommendations for Kingston and Waterloo are provided for improving their levels of response to each set of factors.

The paper concludes that municipal size is an important driver, but internal levels of response are critical success factors. The data analysis matrix developed for this study can be used by other municipalities to help identify appropriateness of internal responses as they relate to the influence of external factors within their municipality.

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Dedication

Behind every person who achieves a life goal is an invaluable support group. Therefore, this report is dedicated to Mom, Dad, Scott and Chuck.

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Chapter 1: Introduction

1.0 Research Problem

Transit was once a great way to move around town. Bus and streetcar networks of the late 1800s criss-crossed cities and towns all over North America, providing a fast, comfortable ride for people previously limited to two feet, three wheels or four hooves. Into the 1900s, rail transit technologies continued to improve in performance and spatial coverage.

Then the private automobile gained widespread popularity in the 1920s and 1930s. In the decades following World War II, major road infrastructure projects were commissioned by federal governments to expand the road – particularly highway – network. The ubiquity of roads and cars “changed conditions in cities dramatically,” and the negative effects of excessive car use on society were, and still are, quite serious (Vuchic, 2005, pp. 6-7). In fact, the “direct, negative impacts of vehicular traffic,” such as toxic emissions, traffic congestion, road accidents and loss of greenspace, “have been known and debated for a long time” (Vuchic, 2005, p. 6).

Now, nearly 60 years since the proliferation of automobile-oriented development, the “legacy of North America’s past transportation choices” – namely the promotion of the automobile and neglect of public transit – has become a crisis for many urban centres across the continent (Rubin, 2009, p. 117; Vuchic, 2007, p. 39). Planners, politicians and the general public have realized the impacts to mobility and quality of life that have resulted and are now, in many cities, seeking to balance transportation.

Transit can play a larger role in people’s daily travel habits if it is a viable option. If transit were once again a great way to get around town, ridership would increase and the greater revenues and demand for services would trigger more investments in the municipality’s transit service.

The challenges that transit agencies face in contemporary North American municipalities are many. Currently, automobile travel remains much more convenient and less expensive – at least in motorists’ considerations of travel time and out-of-pocket costs – than transit for many trips. Behaviourally, many people no longer meaningfully evaluate transit as a travel alternative;

instead, travelers default to their car for nearly all trips. Land use policies at various government levels have been created to promote decentralization and travel supported nearly exclusively by the automobile.

These problems are even more pronounced in mid-sized cities, defined as municipalities with populations between 50,000-500,000 residents (Bunting, Filion, Hoernig, Seasons & Lederer, 2007, p. 28). These municipalities tend to have lower densities, resulting in longer trips and more spatial area for transit to serve. As they grow, they tend to retain this decentralized form: population loss and downtown decay are often experienced and outward suburban growth continues, thus exacerbating further loss in the (already lower density) core (Bunting et al., 2007, p. 30). As a result, auto travel is far more convenient than transit.

1.1 Significance and Purpose of Study

The challenge, then, is to determine methods by which these municipalities may be able to attract transit ridership through the efficient provision of service, and through supportive, implementable policies. There are many factors that can affect an individual's decision to use transit. In aggregate, they affect the overall ridership of transit. Ridership refers to the number of residents who use the local transit system to make any trip, for any purpose, within the municipality. It is often measured through passenger counting devices installed on buses, and this data can be annualized in order to obtain the number of riders a transit agency served in a particular year.

The purpose of this study is to understand and document the external factors that influence transit ridership, specifically in mid-sized cities. External factors are defined as being outside the direct control of a municipality but that can have an influence over the functioning of the municipality and its transit system in particular.

Given this understanding, a second goal of the thesis is to evaluate municipal decision-makers' capacities to understand and successfully react – through policy, budgeting and infrastructure – to these external factors to improve ridership. “If every agency were able to generate a ridership level approaching that of the best-performing systems (operating in similar environments),”

Peck writes, “overall transit usage... would see a dramatic increase” (2010, p. 1). Two Canadian municipalities, the Regional Municipality of Waterloo and the City of Kingston, are used as case examples.

1.2 External Factors Influencing Transit Ridership

There exists extensive literature examining the factors that influence transit ridership. This literature is reviewed in subsequent sections of the thesis. Here, the external factors that were evaluated in this thesis are defined, as well as potential data sources and hypothesized relationships. These factors were selected based on which factors the literature has identified as important and on factors that could provide interesting comparisons between the two municipalities.

Population growth and density – These factors look at the present population levels, population and employment density, and population growth forecasts. Statistics Canada and municipal documents related to trend analysis and growth planning are the main data sources. Generally, higher population and higher population density are thought to be positively correlated to transit ridership. Similarly, population growth has the potential to increase land use density more rapidly and, as a result, increase ridership.

Demographics – This factor looks at senior, student and immigrant population levels (current and forecasted) and ridership among these groups. Statistics Canada, interviews and municipal documents are the main data sources. Generally, students, seniors and immigrant populations tend to have higher ridership rates per capita than the population as a whole.

Regional location – This factor considers proximity to major urban centres. Municipal and commercially available maps and informal discussions with transit staff are the main data sources. Typically, municipalities that are more proximate and therefore influenced more directly by larger urban centres tend to have greater opportunities for higher transit ridership. Moreover, municipalities that are located within a broader regional urban area may be eligible for greater levels of funding in support of transit from various tiers of government.

Federal/provincial impacts – This factor includes Ontario’s *Places to Grow Act* and Provincial Policy Statement, and transit-related funding provided by the federal and provincial governments. Interviews, provincial and federal planning documents and reports on transit projects that received upper tier government funding are the main data sources. The influence of Canada’s federal government on ridership is somewhat indirect, with the most important influence being the provision of funding for major capital projects. The role of the provincial government is much more direct. Municipalities’ policies on land use and transportation are largely derived from provincial standards. As provinces develop transit-supportive policies, municipalities follow. Provinces are also funders for infrastructure.

Fuel prices – This factor considers the impact of increases in fuel price on transit ridership. Interviews and literature on fuel price trends and how these trends influence consumer travel choice are the main data sources. The relationship between gas price and transit use is indirect and requires more long-term studies to determine the exact impact of the rising cost of fuel. Currently, it may be a minor consideration that only slowly discourages a driver’s use of their car.

1.3 Defining Successful Transit

Transit Cooperative Research Program (TCRP) Report 111 (2007) provides a definition of success and several ways to measure it. The report cautions that it is difficult to define and measure success due to the varying goals among transit agencies and the many external and other factors at play. However, the definition of success in the report focuses on a transit agency’s ridership: “minimizing the ridership losses from measures taken to increase revenues or constrain costs” (TCRP 111, 2007, p. 43). The tone of this definition is more pessimistic (minimize losses) rather than optimistic (increase ridership, for example), but perhaps it is a realistic reflection that transit agencies, particularly those in mid-sized cities, are challenged to retain existing riders due to the relative attractiveness of the car’s independent and comfortable mobility, despite its higher overall cost.

As identified by TCRP 111 (2007, p. 43), measures to evaluate the success of ridership strategies include changes and trends in the following:

- System wide ridership (e.g., increased from the previous year or continued growth—or at least sustained levels—over several consecutive years)
- Market share of particular target markets (e.g., increased ridership among market segments such as commuters, college students, or seniors)
- Per capita ridership (e.g., high level compared to other agencies within a similar type of service environment)
- Productivity (e.g., increased passengers per revenue service hour from the previous year)

In this thesis, successful transit is defined as:

- A system in which ridership is increasing on a year-by-year basis as a total percentage of trips taken in a metropolitan area (mode share) and consistent with appropriate targets for individual socio-demographic groups
- Achieving the first goal within budgetary limits, understanding the competition with municipal governments for the allocation of resources

1.4 Research Questions

The goal of this thesis is to evaluate the City of Kingston and Region of Waterloo, and their respective transit agencies, from a transit planning perspective. The overarching questions are below; they are not necessarily answered with a firm “yes” or “no” but provide a theoretical question for the thesis. :

1. Can a mid-sized city experience regular increases in transit ridership and modal share while being able to retain its size and character and overcome external constraints such as regional location, population and demographics?; or
2. Must a city become large in order for transit to become a more attractive option?

The sub-questions operationalize the overarching questions and are answered directly.

1. Which external transit ridership factors are influential in Kingston and Waterloo?
2. What is each municipality’s level of response to each factor?
3. What planning responses are appropriate?
4. Can these findings be generalized to other mid-sized Canadian cities?

Based on this analysis, recommendations are made in terms of the most influential factors in each municipality, where levels of response are lower and what strategies can be taken to improve response. The discussion also opens up to broader observations for the provision of transit service in Canadian mid-sized cities, drawing on the Kingston and Waterloo case studies and related literature. Lessons learned from Kingston and Waterloo may contribute towards a better understanding of transit in mid-sized cities and regions.

1.5 Introduction to Case Studies

The City of Kingston and Region of Waterloo are the two case studies for this thesis. These municipalities were chosen for four reasons:

1. Few studies on mid-sized municipalities – The literature reports that few studies have been done on mid-sized cities, and in particular on their transit systems. Mid-sized municipalities represent one-quarter of all municipalities in North America. If an overall goal is to make these emerging municipalities more sustainable, transit is a crucial component of that.
2. Municipal transit projects – Both municipalities are undergoing transit improvement projects: Kingston’s transit network redesign and Waterloo’s rapid transit project. Both projects are in the planning stages, which is a good time to identify critical factors for success.
3. Similarities and differences – There are similarities and differences among the municipalities’ characteristics that provide interesting comparisons in terms of how the characteristics affect transit ridership. Similar characteristics include the significant presence of post-secondary students and the prevalent suburban development patterns. Different characteristics include municipal size, location and senior demographic.
4. Data availability: The researcher has been involved in projects for both municipalities, so this aided in obtaining data and making informed observations about each study area.

City of Kingston, Ontario

Kingston is a mid-sized city of 119,700 residents and is located approximately 260 kilometres east of Toronto. The city is a single-tier municipality, which means that a single municipal government structure has jurisdiction over all municipal aspects of Kingston. The government is

comprised of an elected 16-member council, including the mayor, and public service employees. Kingston Transit (KT) is the only transit service in the city and it is provided by the City's transit department, which is under the transportation services department.

Kingston City Councillors who were surveyed for this research were asked to describe the city in terms of its demographics, economy and transportation system (Appendix 4 contains councillor survey results). They describe the city as well-educated and mixed-income with a large retirement population. The ethnic makeup is of relatively low diversity, with 8,150 people being a visible minority, or 7% of total population, in the 2006 Census.

The public sector is a major employer: the Canadian Forces Base, Queen's University, Kingston General Hospital, Limestone District School Board, Correctional Services of Canada, City of Kingston and Hotel Dieu Hospital comprise seven of the nine largest employers, with the other two being private sector (City of Kingston⁵, 2009, Appendix A). The manufacturing sector is weak while the retail sector is strong. There is a growing tourism element. The median per capita income in 2006 was \$53,072, which is below the Ontario median of \$60,455 (Statistics Canada, 2006). The population growth rate between the 2001-2006 census years was 2.6% (or 0.52% per year), compared to the Ontario average 6.6% (or 1.32% per year) (City of Kingston⁵, 2009, p. 1).

Councillors describe the transportation system as car-dominated, cyclist- and pedestrian-unfriendly, with good transit service in the downtown but not in the outlying suburbs. Thus, the city can be said to have the typical auto-oriented function as many other mid-sized North American cities that grew after WWII. What exacerbates the auto-dominance is the fact that local traffic volumes are minimal, which makes getting around by car convenient (15 minutes usually being the longest commute time, as reported by one councillor).

The city is an example of the increasing challenges regarding the state of municipal infrastructure, in particular with transportation and public transit. Kingston faces traffic congestion in key road corridors. The city's transit modal split, or percentage of the population that rides transit, is 4% while automobile use is 82% (personal communication with Kingston Transit staff, March 10, 2010; City of Kingston¹, 2004, p. v). Upgrades to transit infrastructure are a required component to increase ridership (City of Kingston¹, 2004, p. vi). As reported in

the 2004 Kingston Transportation Master Plan (KTMP), existing expenditures of \$12.1 million per year “are far short of what is required for replacing the existing infrastructure, which is \$23.3 million [per year]” (City of Kingston¹, 2004, p. x). The cost required for infrastructure increases to \$31.9 million per year when the cost for recommended transportation upgrades is included. The city’s population is expected to grow by 30-45% in the next 25 years, which will exacerbate congestion issues already faced by commuters (City of Kingston¹, 2004, p. 11).

Kingston recognizes these challenges and is currently undergoing the process of redesigning its bus transit network in order to attract new riders. The KTMP outlines the strategic policy direction for transportation over the next 25 years. Its goal is to increase transit usage from 4% to 11% in the next 25 years, or to the year 2030 (City of Kingston², 2005, p. 1).

Region of Waterloo

Waterloo is a large mid-sized urban centre that is forecasted to become a large urban centre in the next 20 years. It is approximately 115 kilometres west of Toronto with a population of 543,700 (Region of Waterloo⁴, 2010, p. 2). In contrast to Kingston, the region contains two tiers of government, each with their own geographical jurisdiction and mandate. The Regional Municipality of Waterloo is an upper-tier government with direct control over a number of services and policies that apply to all residents in the region. Transit, public health, waste management, police and strategic land use planning are some examples of regionally provided services. There is an elected regional council, headed by the Regional Chair, which represents the different wards. Grand River Transit (GRT) is the regional transit service operated under the Region’s Transit Services department; the transit planning functions are done by staff in the Planning, Housing and Community Services department.

The lower tier municipalities within the Region (three cities and four townships) are each run by separate mayors, councils and staff departments. Examples of lower tier responsibilities are economic development, parks, local roads and land use development approvals.

Waterloo Regional Councillors surveyed for this thesis describe the region as ethnically diverse, young and well educated. The region attracts many young, upwardly mobile families due largely

to its strong high tech sector. The population includes 61,980 residents of visible minority, or 13% of the population, in the 2006 Census (Statistics Canada, 2006). The region is the third youngest population by median age in the entire country (City of Waterloo, 2005, p. 9).

The economy is described as prosperous, innovative and integrated. Major employers are a mix of public sector and private sector. The top ten employers are Waterloo Region District School Board, Research in Motion, Toyota, Grand River Hospital, Region of Waterloo, University of Waterloo, Waterloo Catholic District School Board, Sun Life Financial, Manulife Financial and Schneider/Maple Leaf Foods (CIT², 2009). Tourism is strong, having employed over 5,000 people and bringing in \$165 million in tax revenue in 2007 (Dalton, 2010). The median per capita income in 2006 was \$64,522, which is above the Ontario median. The population growth rate between 2001 and 2006 was 9.0% (1.80% per year) (Statistics Canada, 2006), which is above the provincial average.

Councillors describe the region's transportation system as auto-dependent with too-long commute times, but they say the shift to transit is evolving. The Region recognizes that if it continues to implement road-centric solutions, by 2031 the following impacts would be felt in the community (Region of Waterloo¹, 2010, p. 2). The regional road network would need to be expanded by 25% within urban areas, and 280 of these roads would still experience congestion. Homes would be removed for road rights-of-way. There would be adverse impacts on cultural heritage and the natural environment, including habitat destruction and storm water impacts.

Waterloo is currently undergoing the planning process to implement rapid transit (light rail transit), and has been working to redesign its bus transit network in order to support the future rapid transit system. The region's modal split is about 4.5-5% and the population is expected to grow by approximately 43% from 2006 to 2029 (personal communication with Grand River Transit staff, July 20, 2010; Region of Waterloo², 2010, p. 11). Several policy documents, including the 2003 Regional Growth Management Strategy and Regional Transportation Master Plan, call for improvements to the transit system to accommodate future growth. The Region's target transit modal share is 17.3% by 2031 (Region of Waterloo¹, 2010, p. 8).

Table 1 displays municipal and transit statistics for Kingston and Waterloo, which will be further explored in the analysis of the related external factors in Chapter 4. Statistics are from sources produced between 2006 and 2011. Figure 1 shows the geographic context of Kingston and Waterloo.

Table 1: Municipal and transit statistics for the City of Kingston and Region of Waterloo

Municipal Statistic		City of Kingston	Region of Waterloo
Population		119,700	543,700
Population growth	Average annual 2001-2006	0.52%	1.80%
	Forecast average annual: Kingston 2009-2026 Waterloo 2010-2031	0.65%	1.62%
Population density		266 people/km ²	397 people/km ²
Demographics:	% seniors 65+	15.3%	12.0%
	% students	14.7%	14.5%
	% immigrants	14.0%	22.0%
Location: proximity to closest large urban centre		192 km (to Ottawa)	117 km (to Toronto)
Significant federal policies/programs:	Receives gas tax revenues?	Yes	Yes
	Required to follow Provincial Policy Statement?	Yes	Yes
Significant provincial policies/programs:	Required to follow Places to Grow?	No	Yes
	Receives gas tax revenues?	Yes	Yes

Transit Statistic	City of Kingston	Region of Waterloo	Ontario Mid-sized Municipalities (average among the 50,000-500,000 pop. group)
Annual ridership (revenue passengers)	3,348,503	16,599,974	4,137,728
Annual ridership change (average 2002-2009)	+3.96%	+6.57%	+5.17%
Service provided (# revenue vehicle kilometres (RVK))	3,485,146 km	11,271,570 km	3,618,937 km
Service utilization (transit trips/capita)	31 trips/person	39 trips/person	26 trips/person
Service efficiency (riders/RVK)	0.96 riders	1.47 riders	1.03 riders
Cost efficiency (operating cost/RVK)	\$3.29/RVK	\$5.16/RVK	\$4.21/RVK

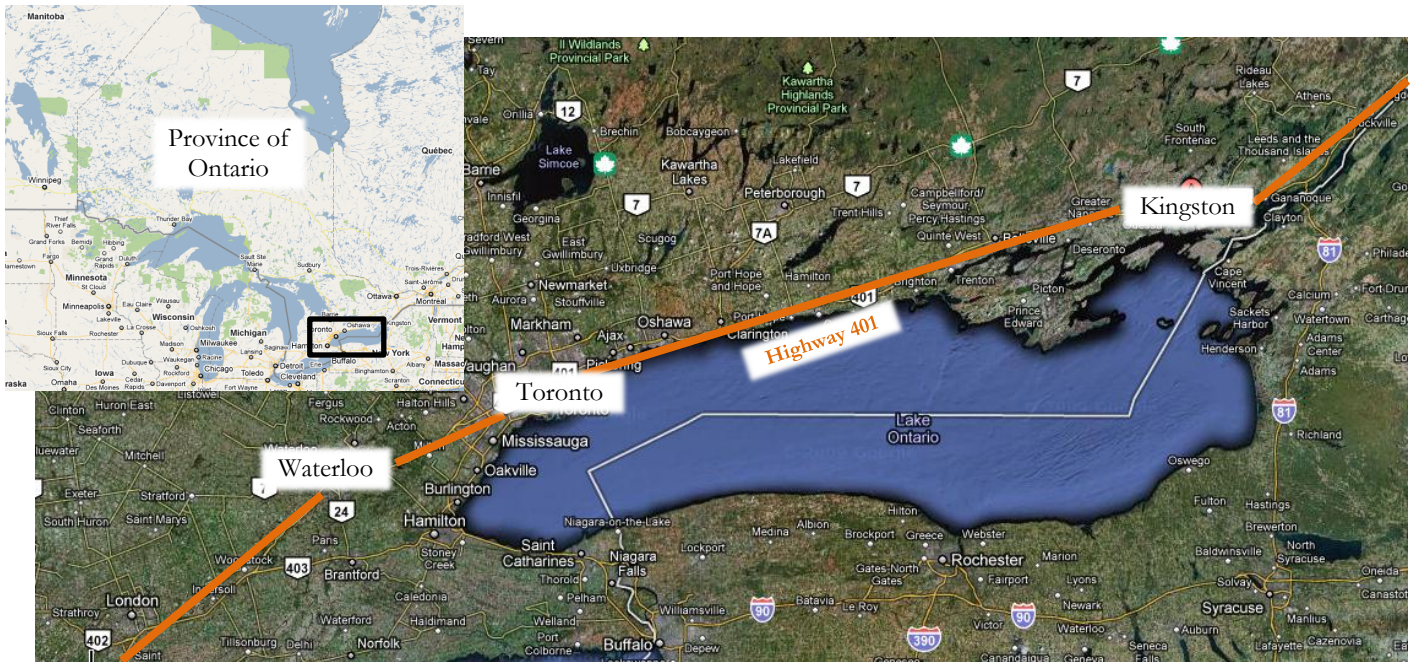


Figure 1: Locations of the Region of Waterloo and City of Kingston. Source: Google Maps

1.6 Scope of Thesis

This thesis provides a qualitative analysis of issues that provide opportunities or limitations to successful transit ridership. The study uses key informant interviews, City and Region councillor feedback and supporting qualitative and quantitative data reviews. The technical side of transit provision, such as vehicle technology, rights-of-way options, scheduling, and other specific infrastructure and technological aspects, are outside the scope of this study. This approach is appropriate since “in recent decades the main problems in urban transportation have occurred due to deficiencies in the treatment of transportation – its planning, organization, and policies – rather than by a lack of technological solutions” (Vuchic, 2007, p. 41). The technological side is equally important in the planning and implementation of any transit investment, and requires a different set of skills and resources for proper evaluation.

1.7 Outline of Thesis

This thesis is organized into the following chapters and sections.

Chapter 2 (Literature Review) presents literature on the overarching topics discussed in this thesis, and provides more detail about transit operations in the two case municipalities, Kingston and Waterloo.

Chapter 3 (Methodology) explains the research methods used to conduct this study, including the research framework, external ridership factors, and sources of information.

Chapter 4 (Results) presents the findings and analyses of each ridership factor under study. Each factor is written as a self-contained section, which includes: literature discussing the significance of the factor; primary research findings to identify the level of response to each factor within Kingston and Waterloo; and summary using a matrix to indicate the factor's level of influence on ridership and the municipality's level of response regarding the factor.

Chapter 5 (Conclusions and Recommendations) summarizes the major conclusions from Chapter 4. It then provides a set of planning recommendations for Kingston and Waterloo staff to implement in order to focus their attention on the most important factors, which will help address opportunities or challenges to increasing transit ridership. Future research areas are discussed.

Chapter 2: Literature Review

2.0 Chapter Outline

The previous chapter presented the research problem and purpose of the study, defined the five sets of external factors under evaluation, presented the research questions and introduced the case study areas, Kingston and Waterloo.

The objectives of this chapter are to:

- List sources of transit literature and identify gaps
- Explore the historical evolution of cities, emphasizing the relationship between transportation, land use and the role of transit; this section provides and validates the motivation for the thesis
- Describe the particular characteristics of mid-sized cities and related transit challenges
- Identify those variables that are known to be important in influencing transit and decision making
- Establish the policy contexts for both case study areas

2.1 Overview of Literature and Deficiencies

Many studies have been written to identify the success factors that help increase transit ridership. No fewer than 11 Transit Cooperative Research Program reports have looked at how to build transit ridership, identified future trends in the transit market, and looked at the needs of suburban and rural transit systems. The U.S. Federal Transit Administration (FTA) also maintains a website called Innovative Practices for Increased Ridership, which is a searchable repository and dissemination resource on success stories of transit agencies across the United States. This database is comprehensive and likely contains lessons that can be transferred to Canadian transit systems; however, it does not include Canadian examples and thus is unable to be as relevant within an Ontario context.

The Association of Municipalities of Ontario hosts an Ontario Municipal Knowledge Network website which, similar to the FTA website, allows municipal managers to access success stories

on various municipal initiatives, including transit. This is a good resource, but is limited in its inventory of transit success stories as it showcases only two such examples from 2006 and six from 2004.

Individual reports by transit agencies and practitioners are written on specific challenges that agencies face. For example, Peck (2010) and his team conducted a study on the barriers to using fixed transit routes that older adults face. Haire & Machemehl (2010) write about the impacts of fuel prices on ridership. These reports provide more in-depth information for individual subject areas that can be used to create a holistic picture of transit ridership impacts in specific cities.

This thesis is written about two mid-sized Canadian municipalities. Studying transit in mid-sized cities in Canada is still a nascent field: Andreas writes that there has been a deficit of research focussing on either mid-sized city transit or Canadian transit since 1976 (2007, p. 22). What the literature does report is that mid-sized cities are different, with their own distinct characteristics, opportunities and limitations that act on the city's transit system. Different municipal environments require different strategies. The suburban environment is perhaps the single greatest challenge facing the transit industry due to the increasingly dispersed travel patterns in suburban settings (TCRP 111, 2007, p. 38). This type of environment is defined as a stand-alone community within a metropolitan area; the suburban municipality's transit system is typically operated by a single transit agency (TCRP 111, 2007, p. 38). It is prudent for planners to design specific services for their urban environment because they can be quite effective at generating ridership (TCRP 111, 2007, p. 38).

2.2 History of Transit, Transportation and Land Use

For much of human history, the transportation options available to people living in cities were limited to walking and wheeled vehicles such as horse-drawn carriage. In the 1800s, rail technology brought a significant advancement to urban transportation in the U.S. and Canada. This is referred to as the tramway evolution. By 1893, 800 kilometres of tramway were constructed in 16 American cities (Vuchic, 2007, p. 14). In the 1920s, a staggering 90% of all trips in the U.S. were made by electric-powered rail transit, and only one in 10 people owned a

car (Rubin, 2009, p. 118). (By then, the modern private automobile had existed since 1893, although it was mostly affordable only to the wealthy (Berger, 2001, p. xvii).)

By the 1930s, “competition from the private automobile began to have a significant impact on streetcar ridership in the United States” (Vuchic, 2007, p. 22). Government preference for auto-oriented infrastructure, development of the trucking industry, subsidies for low-density housing, and powerful lobbyists in Detroit’s auto sector were contributing factors for the shift from transit to cars (Vuchic, 2005, pp. 7, 9 & 15; Rubin, 2009, p. 117; Hodge & Gordon, 2008, p. 111). For example, the U.S. Federal Aid Highway Act and the Highway Revenue Act of 1956 authorized a 66,000-km network of interstate highways and intended for at least 90% of all urban areas with a population of over 50,000 to be connected by highways (Vuchic, 2005, p. 93).

Paralleling the significant improvements in personal mobility offered by streetcars (to a limited extent) and by automobiles (to a great extent), land use patterns changed. Streetcar lines extended beyond the urban edge into undeveloped land, allowing people to live farther from the core on bigger lots of land and spend the same time travelling to work (Pederson, 1980, p. 11). Land densities in these outlying suburbs could be much lower than in the urban core, though this decentralization was still largely confined to areas adjacent to rail lines. Land use decentralization then proliferated with the automobile’s rise in popularity, particularly after World War II. This phenomenon is now referred to as suburban sprawl – the sprawling out of land development into undeveloped areas that surround established urban centres. The development is usually identified as dispersed, auto-oriented and irregular (Lindstrom & Bartling, 2003, p. xii; Frumkin, Frank & Jackson, 2004, p. 1).

Today, automobiles are a significant presence in virtually every North American city, despite the incongruence of this mode with the very nature of cities. Cars demand a lot of space per passenger. For example, “a trip by car consumes about 30 times more area than one by bus, and 40 times more than a trip on a rail line” (Vuchic, 2005, p. xx). Suburban residential developments made possible by the car typically have poor, indirect road connectivity and large housing lots, which require auto dependency in order to reach destinations such as shopping and school (Frumkin et al., 2004, pp. 8 & 67). Cars are a significant source of air pollutants (Frumkin et al., 2004, p. 68) and are associated with much higher fatality rates compared to other modes of

transportation. For example, in a 2003 travel survey in Great Britain, the number of deaths per billion hours of travel in a car, van or truck was 147 while for transit it was 4.8 (Litman & Fitzroy, 2010, p. 23).

Planners and other city officials now realize that roads necessitate the development of more roads rather than fewer. Thus, suburban growth and highway congestion have increased the public sector's interest in modernizing railway lines to reintroduce them for passenger service (Vuchic, 2007, pp. 35 & 39), as well as improving conventional bus transit and intercity transit connections.

The influence of automobile growth is reflected in transit ridership data (Andreas, 2007, p. 1). In the U.S., ridership peaked in 1908 and tumbled 75% by 1970 (Yago, 1984, p. 11). In Canada, ridership decreased from 13% of total trips in 1950 to 5% in 2000 (Hodge & Gordon, 2008, p. 111). In 2006, this figure rebounded to a modal share of 15% in Canada (CUTA², 2010, p. 15). The Montreal, Toronto and Vancouver census metropolitan areas accounted for 67% of all ridership in 2007, while they comprised 34% of Canada's population (Urban Transportation Task Force, 2009, p. 4). These statistics help demonstrate the need to improve transit ridership in the country's mid-sized municipalities.

Kingston and Waterloo are among the municipalities trying to reverse the harmful effects of car dominance. As mentioned in Chapter 1, both municipalities are undertaking important transit improvement projects with the goal to increase transit modal share significantly over the next 20 or so years.

2.3 Mid-Sized Municipalities and Transit

Mid-sized cities, those ranging in size from 50,000 to 500,000 residents, comprise one-quarter of all North American cities (Bunting et al., 2007, p. 28). Not only are there limited studies on transit in these municipalities, indicated by Andreas, but also there are limited studies on mid-sized municipalities in general (Bunting et al., 2007, p. 28). Instead, most literature on urban issues concentrates on places with 1 million or more people.

Mid-sized municipalities are distinguished as having a good balance between the convenience, access to natural amenities and low traffic congestion of a small town and the urban vibrancy and economic opportunities of a big city (Bunting et al., 2007, p. 44). These mid-sized municipalities often originated as low-density suburbs built to serve a nearby large urban centre, and as they grew they developed into cities of their own right. However, low population and land use density, dispersed travel patterns and high rates of automobile use remain common characteristics of these places (Bunting et al., 2007, pp. 28 & 44). As they grow, they become even more dispersed, especially if the municipality lacks an anchoring downtown and if local land use policies fail to prevent outward development into surrounding rural areas. Other factors that perpetuate the suburban, rather than urban, environment include residents' preferences for natural amenities, private home ownership and auto-oriented convenience (Bunting et al., 2007, p. 45). Whether these preferences are the actual preferred choices of residents or the habituated result of the suburban landscape is unclear.

What is clear, though, is that the historical evolution of mid-sized municipalities – decentralized and auto-centric – does not promote transit ridership. “Most mid-size places are unable to generate a self-reinforcing, inner-city, land use/transportation dynamic based on transit and pedestrian travel,” Bunting et al. write (2007, p. 46). The municipalities continue to stretch out and land uses must be adjusted to widespread car use, leading to an urban fabric that is “inhospitable to alternative modes of transportation” and more compact urban forms, which are characteristics that “are widely held to be the path to a more sustainable future” (Bunting et al., 2007, pp. 47-48).

2.4 Overview of Factors Affecting Transit Ridership

Increasing ridership is a goal among all transit agencies. Ridership is one of the main measures an agency uses to compare actual performance to targets, and how the agency compares itself to other agencies. Higher ridership often means more of the offered capacity is being used, which means the system is operating more efficiently.

Ridership growth also produces greater revenues; as long as these revenues increase faster than operational costs, the revenues can be used to improve the services and amenities of the transit

system, which helps increase ridership further. This is sometimes referred to as a virtuous cycle. Since transit agencies compete with other municipal departments for scarce resources, this further highlights the importance of being able to generate revenue to help fund transit operations.

The Transit Research Cooperative Program Report 111 recognizes that strong ridership also “supports a broad range of public policy goals, including air quality improvement, energy conservation, congestion reduction, provision of mobility to the transportation-disadvantaged, access to jobs, and promotion of economic development and sustained growth initiatives” (TCRP 111, 2007, p. 1). Hence, providing support for transit is a way for municipal governments to help achieve these goals.

Factors that influence transit ridership are complex and interrelated. It is usually combinations of reasons why people choose to drive their car instead of take transit or vice versa, whether it is a local bus or intercity rail. TCRP Report 111 explains the usefulness of identifying external factors: “while an agency may not be able to explicitly control these external factors, it can monitor them, anticipate their potential impact on transit demand, and take actions to mitigate—or take advantage of—them” (TCRP 111, 2007, p. 6). See Appendix 5 for a discussion on why people’s travel choices are influenced by a number of factors whether internal or external factors are more important in encouraging transit ridership.

Most Influential External Factors

Table 2 summarizes the external factors that have been shown to most strongly influence transit ridership, as identified by three reports that synthesized much of the literature on external factors – TCRP 111 (2007, pp. 6-12), TCRP 29 (1998, p. 27) and Taylor, Miller, Iseki and Fink (2008, p. 15). While there is no hierarchy in the table, the first two sets of factors listed are often cited as the most important factors to affect ridership.

Also, while traditionally the factors in the table have been externally driven, a number of them are increasingly seen by municipalities as opportunities where policies and initiatives can be used as tools to influence the factor. For example, while parking availability may have been more

developer-driven (land and business owners want to provide sufficient parking for customers), municipalities are now considering parking maxima policies to encourage residents to use alternative modes of transportation in order to reach shops and services.

Table 2: List of most important external factors that impact transit ridership

<p><i>Population growth, population density and demographics</i></p> <ul style="list-style-type: none"> - Larger population creates an expanded ridership base, particularly if the growth is in the populations of senior citizens, university students and recent immigrants, and to a lesser extent tourists - Greater densities result in transit serving more people per unit of area compared to lower densities, which often means a better level of service is provided to those higher density areas
<p><i>Local and regional economic conditions</i></p> <ul style="list-style-type: none"> - When the economy does well, ridership increases due to greater demand for travel in general (e.g. growth in late 1990s) - When the economy declines, so does ridership (e.g. in the early 2000s)
<p><i>Cost and convenience of other modes relative to transit service</i></p> <ul style="list-style-type: none"> - Rising fuel prices - Increased congestion - Longer auto travel times - Reduced parking availability
<p><i>Federal/provincial transit operating assistance</i></p> <ul style="list-style-type: none"> - When this is reduced and not matched at the provincial or local level, it suppresses ridership growth - Agencies do not have resources to address demand increases
<p><i>Public policies (provincial or federal)</i></p> <ul style="list-style-type: none"> - Integrate transit with education, social service programs and welfare-to-work efforts - Aimed at improving air quality such as car emission standards and anti-idling bylaws
<p><i>Regional development patterns</i></p> <ul style="list-style-type: none"> - Residential/employment relocation - Increased or decreased suburbanization

2.5 Kingston and Waterloo Policy and Operating Contexts

Kingston Official Plan

An Official Plan (OP) is a document required by Ontario municipalities under the provincial *Planning Act*. The OP is a strategic, long-term plan that outlines the policies that guide land use development within the municipality's borders, typically over a 25-year period. It coordinates the development of the municipality's built form and physical infrastructure, such as water and transportation, and outlines the desired community attributes to be managed and conserved,

such as cultural heritage, natural resources and other public interests. All public and private development or redevelopment proposed in the municipality must conform to the OP. The document is developed by municipal planning staff, with consultations from other departments, institutions, the private sector and members of the public. It is adopted by city or regional council and ultimately approved by the Ontario Ministry of Municipal Affairs and Housing. Every five years, the OP must go through an official review.

Kingston's Official Plan 2010 is the first OP for the City of Kingston as an amalgam of three former jurisdictions – the City of Kingston, Township of Kingston and Pittsburgh Township – which amalgamated in 1998. The OP sets a course for sustainable development and land use patterns to the OP's horizon year 2026. To paraphrase, the overall goals of the OP are to (City of Kingston³, 2010, s. 2, p. 21):

- Protect and strategically deploy the natural, cultural and built resources of the City
- Make all buildings carbon neutral by 2020
- Limit the extension of infrastructure or automobile reliance
- Foster local food sources
- Promote practices that increase sustainable development

From a transportation perspective, the policy direction under the OP is to support walking, cycling and transit, as well as commercial traffic, inter-regional travel and private vehicles (City of Kingston³, 2010, s. 4, p. 169). The plan aims to promote active modes of travel and reduce the need for automobile travel, while recognizing that automobiles will remain the primary travel mode in the city. For example, many of the transit-related policies in the OP require new commercial and residential developments to be mixed use and high density in order to be transit supportive. The OP indicates that infrastructure provision should promote transit use as outlined in the Kingston Transportation Master Plan. Appendix 7 contains a complete list of the transit-related policies and brief descriptions.

Kingston Transportation Master Plan

The 2004 Kingston Transportation Master Plan contains the policies for the strategic direction of the city's transportation network over the next 25 years. The outcomes guided by the KTMP may influence every trip taken by residents and visitors by outlining the investment priorities, system performance targets and supporting programs and infrastructure related to transportation (City of Kingston¹, 2004, p. v).

The strategic direction of the KTMP “focuses on satisfying travel demand by making efficient use of the existing infrastructure and by providing the facilities and services to encourage walking, cycling and transit as priority modes, before providing road based solutions” (City of Kingston¹, 2004, p. v). Specific to transit, the main objective is to increase transit modal split from its current level of 4% to 11% by 2029. The city recognizes that to achieve this target “investment in transit services and infrastructure will need to expand significantly” (City of Kingston², 2005, p. 1). Therefore, specific strategies include increasing the frequency, service hours and accessibility of service; providing a range of route structures, such as flexible and fixed routes and commuter and tourist shuttles; improving coordination with inter-city bus, rail, ferry and airport services; and modernizing the fleet (City of Kingston¹, 2004, pp. vi-vii). All of these strategies are internal in nature as they involve improving factors that are under the direct control of the municipality or transit agency. The KTMP is not requiring an assessment of the external factors that may be affecting KT's ridership and that could help to inform some of the internal strategies.

Transit Service in Kingston

The transit system in Kingston serves about 108,500 people. Forty-five buses operate on 15 routes seven days per week. The city's transit service is branded “Kingston Transit.” Operational service and transit planning are done by the Transit Division and the fleet is maintained by the Fleet Division; both are part of the Operations Department.

The three transit focal points are: the downtown transfer station at Bagot and Brock Streets; the Kingston Centre; and the Cataraqui Town Centre (the latter having the largest transit sales). Other main transit centres/attractors are Gardiners Town Centre, Queen’s University, St. Lawrence College and Kingston General Hospital (City of Kingston², 2005, pp. 12 & 37). The seven main transit corridors are Princess, Montreal, Division and King Streets, Bath and Gardiners Roads, and John Counter Boulevard (City of Kingston⁷, 2008, p. 30). See Figure 2 for a general overview of these major corridors and activity centres.



Figure 2: Major activity centres and corridors in Kingston

Kingston Transit has experienced a ridership increase of 31% between 2002 and 2009 (the last year of data availability), but there was a decrease of 0.92% between 2008 and 2009. Figure 3 shows the annual ridership for Kingston and all other mid-sized transit agencies in Ontario, those with a municipal population of between 50,000 and 500,000. Compared to other mid-sized municipalities, Kingston’s ridership is lower and its rate of growth is almost the same. Kingston’s transit ridership per capita, which is the average number of transit trips made per person in a year, was 31 in 2009; this is an increase from 23 trips per person in 2002.

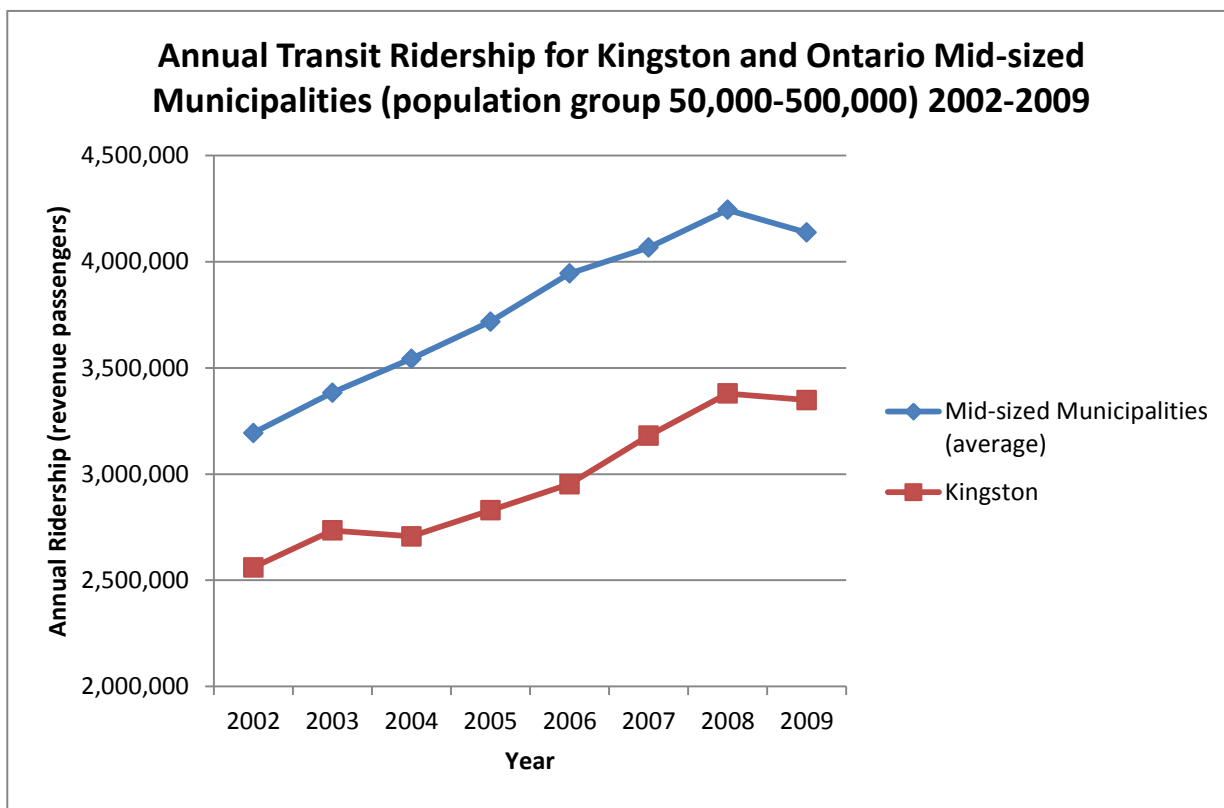


Figure 3: Annual transit ridership for Kingston and mid-sized municipalities. Statistical source: CUTA/MTO Ontario Urban Transit Fact Books

To further grow ridership and continue to work toward the goals in the KTMP, the city has implemented a number of initiatives intended to improve overall service. An online trip planner was launched in 2009, allowing potential riders to plan transit trips and determine required transfers and walking times from their residence. Kingston Transit also partnered with Google in 2010 for Kingston bus routes to appear on Google Transit’s website. A bus stop calling system, which provides audio stop announcements and shows the next stop on electronic signs, was installed in 2008 on each bus. This initiative ensured compliance with the Ontario Human Rights Commission. A smart card system was implemented in 2008. These are reloadable, monthly or 10-ride cards that are used by tapping the card onto the fare box onboard each bus. GPS devices were installed in 2008, allowing improved coordination and scheduling between in-service vehicles. As of 2007, each bus is equipped with a bike rack during the cycling season (they are removed in the off-season). In addition, the Kingston Shopping Centre, a major transfer point and terminal location, was upgraded in 2005 to improve passenger comfort and visibility of transit; it now includes shelters, bus bays, improved lighting and signage, and transit priority

signals at one of the entrances to the mall. Starting in 2003, KT began using low floor buses to make their service more accessible. In 2010, two new routes began service to provide better connections to the VIA and Coach Canada stations and to make a new uptown east-west connection.

These improvements will contribute toward improved transit service. Kingston is looking to continue improving the system and has worked with the University of Waterloo to redesign their route network.

Waterloo Regional Official Plan

Waterloo's Regional Official Plan (ROP) was approved with modifications by the Ontario Ministry of Municipal Affairs and Housing in January 2011, and is currently under appeal to the Ontario Municipal Board by various appellants (most of whom own land in rural areas that are slated for protection through the new ROP policies). The new ROP replaces the Regional Official Policies Plan, which was approved in 1995 and consolidated in 2006. The ROP will become final once the appeals process is complete and the Ontario Municipal Board renders its decisions.

Similar to the Kingston OP, the ROP contains major themes related to sustainable development. Unlike the Kingston OP, however, the ROP must be updated to comply with the provincial *Places to Grow Act* since the region falls within the growth plan area of the act. The act, and the *Places to Grow: Growth Plan for the Greater Golden Horseshoe, 2006 (P2G)* that was created under the act, requires all municipalities within the growth plan's boundary to develop differently than had been common practice in the past several decades (MPIR, 2006). Some of the main requirements of the 25-year plan are to intensify urban areas, protect farmland, create complete communities, provide housing options and improve transportation choice. Complete communities are neighbourhoods developed to provide the functions required for people's daily living – jobs, housing, services, schools, recreation and infrastructure – and ensuring convenient and safe options for transit, walking and cycling. Following these focus areas, the ROP's vision statement, paraphrased, is to (Region of Waterloo², 2010, p. 2):

- Be an inclusive, thriving and sustainable community

- Maintain harmony between rural and urban areas
- Embrace sustainability and liveability as central policy concepts in the ROP

The ROP places significant emphasis on non-auto based travel. Similar to Kingston’s OP, the ROP promotes walking, cycling and transit initiatives ahead of automobile initiatives. Another key policy objective is to support the Region’s planned rapid transit service. Policies will require that development applications make provisions for rapid transit stations, stops, rights-of-way and other infrastructure, and to include transit oriented development elements (e.g., compact urban form, mixed use, walkability, access between transportation modes). Both the ROP and the Regional Transportation Master Plan establish the framework for the transportation system (Region of Waterloo², 2010, p. 39).

Waterloo Regional Transportation Master Plan

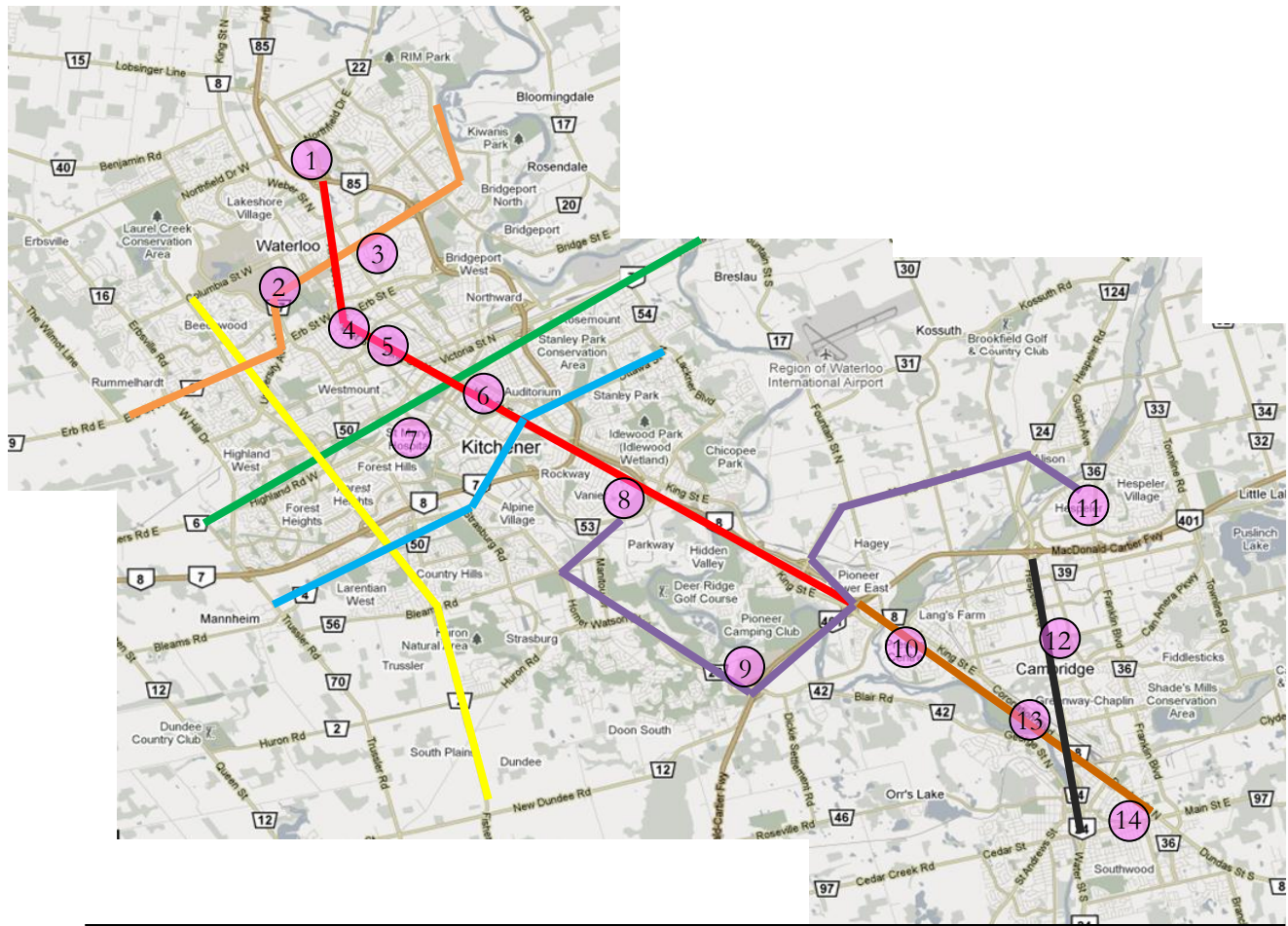
The Regional Transportation Master Plan 2010 (RTMP) lays the strategy for the transportation system over the next 20 years. The recommended strategy “builds on more recent successes in increasing transit ridership, and supports new cycling and pedestrian infrastructure” in a more compact urban form, while recognizing that driving will remain a major means of travel (Region of Waterloo¹, 2010, p. 1). The RTMP is guided by the *Places to Grow Act*, ROP, Regional Growth Management Strategy and Rapid Transit Environmental Assessment.

A major objective of the RTMP in terms of transit is to shift the modal split from its current level of around 5% to 17%. Specific strategies to achieve this target include the following (Region of Waterloo¹, 2010, p. 3). Transportation demand management, such as corporate bus pass programs, will educate regarding alternatives to car use. Intelligent transport systems use enhanced technology features to improve a rider’s experience, such as transit signal priority and real-time next bus arrival announcements. Increased service frequency will improve the convenience of taking transit. Better inter-regional coordination between Grand River Transit and Greyhound, VIA Rail and GO Transit is intended to promote local transit use for the start and end portions of longer distance trips.

Transit Service in Waterloo

Grand River Transit is an 11-year-old agency and has a fleet of 218 buses. The transit system serves the three cities within the region, or about 422,200 people. The day-to-day operational service is performed by the GRT Services Division of the Transportation and Environmental Services Department. The transit planning component is done by the Transportation Planning Division in the Planning, Housing and Community Services Department. The fleet is managed by the Fleet Division in the Corporate Services Department.

The three cities within Waterloo Region each have their own transit hubs and focal points. GRT's previous 5-year Business Plan 2001-2005 identifies the major transit attractors (Region of Waterloo¹⁰, 2001, pp. 32-34), and they are shown on Figure 4 along with the major transit corridors. Numbers 1-4 in the pink circles show the attractors in the City of Waterloo. Numbers 5-9 are the attractors in the City of Kitchener and numbers 10-14 are the City of Cambridge attractors. The region has a Central Transit Corridor (CTC), King Street, and most of the other major corridors are east-west feeders into the King Street corridor.



Legend	
Major Activity Centres	
1 Conestoga Mall	8 Fairview Mall
2 University of Waterloo/Wilfrid Laurier University	9 Conestoga College (Doon Campus)
3 Conestoga College (Waterloo Campus)	10 Preston downtown (Cambridge)
4 Uptown Waterloo	11 Hespeler downtown (Cambridge)
5 Grand River Hospital	12 Cambridge Centre
6 Downtown Kitchener	13 Cambridge Memorial Hospital
7 St. Mary's Hospital	14 Galt downtown (Cambridge)
Major Corridors	
— King St	— University Ave/Erb St
— Fischer Hallman Rd	— Highland Rd/Victoria St
— Ottawa St	— Homer Watson/Maple Grove Rd
— Coronation Blvd	— Hespeler Rd

Figure 4: Major activity centres and corridors in Waterloo Region

Between 1999 and 2009, GRT increased its annual service hours by 68%, which helped result in a ridership increase of 74% (from 9.5 million riders to 16.4 million riders) (Region of Waterloo¹, 2010, p. 5). Between 2008 and 2009, ridership increased 5%, and between 2002 and 2009 it increased 56%. The annual transit ridership for the years 2002-2009 are in Figure 5. Data lines for Kingston and other mid-sized municipalities are displayed for comparison. Waterloo's ridership is well above that of Kingston and mid-sized municipalities and its rate of growth is

much greater. Between 2002 and 2009, the average rate of ridership growth in Waterloo was 6.57%, while that for Kingston and mid-sized municipalities was 3.96% and 3.81%, respectively. In terms of per capita transit usage, in Waterloo Region roughly 11 more trips per person were made by transit between 2002 and 2009, from 28 to 39.

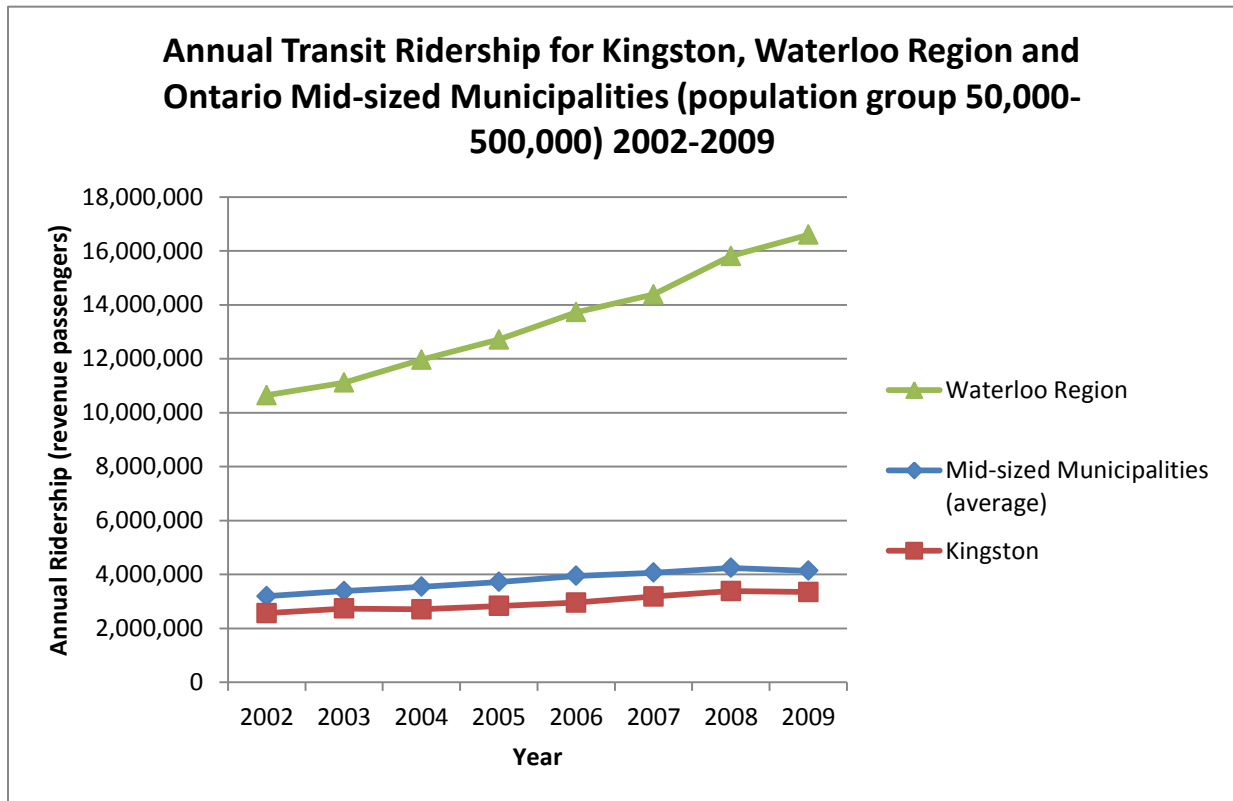


Figure 5: Annual transit ridership for Waterloo, Kingston and mid-sized municipalities. Statistical source: CUTA/MTO Ontario Urban Transit Fact Books

A number of recent service improvements can be attributed to ridership increases in the past decade, the most significant being the Urban Transportation Showcase (UTSP) and iXpress service. The UTSP was a federal competition for which GRT was granted \$2.65 million in 2003 to implement a number of transit programs. The centerpiece of GRT’s submission to the UTSP was iXpress, which became operational in 2005. This is a uniquely branded express service along the CTC. It provides limited-stop express service to key destinations along the corridor, including two shopping malls, major employment areas, the two universities, the downtowns of Waterloo, Kitchener and Cambridge, Grand River Hospital and transit terminals. iXpress offers shorter travel times, transit signal priority, maximum 15-minute headways, electronic real-time next bus displays, shelters and improved walking and cycling access.

Other transit projects have included making over 85% of buses wheelchair accessible and buying six hybrid buses, which have lower air emissions than regular buses (Region of Waterloo³, 2009). Since 2008, automated visual and audio stop announcements have been installed on many routes. A web-based trip planner was made available in 2008. In 2005, the region was the first municipal transit system in Ontario to install bike racks on all buses (Region of Waterloo⁸, 2008, p. 7). Also in 2005, automatic passenger counting was in place, which helps transit planners determine under- and over-capacity routes. Finally, service expansions were made each year between 2001 and 2008, except for 2006, which was an election year.

2.6 Summary of Literature Review

In summary, it is shown that transit historically was a lower infrastructure and policy priority than the automobile, but that municipalities are increasingly recognizing the important role transit plays in sustainable transportation and desirable land development. Kingston and Waterloo have experienced transit ridership increases in the past decade. Within the past 5-10 years, municipal policies and investments have demonstrated a focus toward improving the attractiveness and boosting ridership.

The literature shows that a number of external factors can influence ridership. Commonly cited external factors are population growth, economic strength, government policies and financial assistance, relative costs of other transportation modes, and regional development patterns.

The next chapter will outline the methods used to research the specific ridership factors that are pertinent in the City of Kingston and Region of Waterloo. Following that, the research results of selected factors will be discussed.

Chapter 3: Methodology

3.0 Chapter Outline

Chapter 2 presented literature on the major themes in this thesis. It identified some gaps in the literature regarding mid-sized Canadian municipalities, explored the historical development of cities and transit, explained mid-sized municipality characteristics, delved further into external ridership factors, and established the Kingston and Waterloo contexts.

The objectives of this chapter are to:

- Describe the research approach and framework
- Illustrate the research methods
- Introduce and explain the data analysis matrix that will be used throughout Chapter 4

3.1 Qualitative Research Approach

This study takes a qualitative approach to ridership analysis. Multiple data sources are used, including interviews, surveys, transit theory literature, case study documents and reported statistics, in order to obtain information from a variety of perspectives on transit in the two study areas. The information was used to “paint a picture,” or develop general qualitative conclusions on each transit situation. The past decade (2000-present) was the timeframe for which data collection was concentrated. Data are most readily available for this period – statistically and from participant knowledge – and it is arguably the most relevant in informing the current transit situation.

3.2 Theoretical Framework

The theoretical lens that guided this research process is that transit service is desirable in most communities and that low transit ridership is “the problem” that requires studying. While this is the lens through which the data are approached, it is not a theory. Figure 6 displays the theoretical framework used for this thesis. The figure shows the bottom-up nature of the process.

A slight departure from this framework is that the themes (factors) were identified prior to data collection. This was to provide guidance on what to ask of participants and ensure that the same variables were compared between the two municipalities. Themes were developed through literature reviews and the researcher’s knowledge of transit gained through coursework in transit planning.

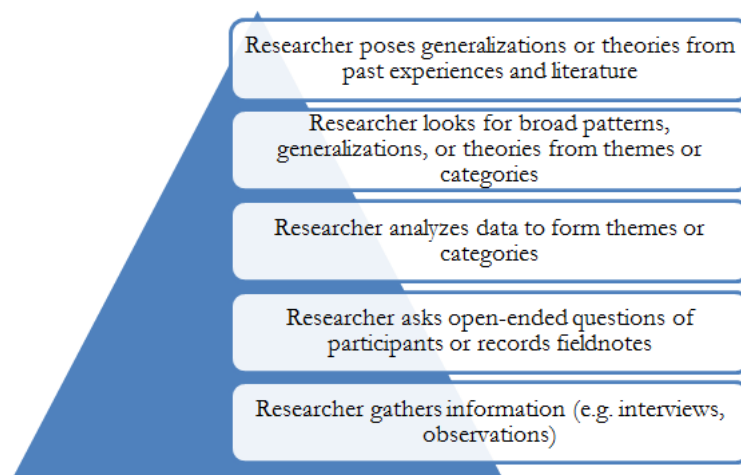


Figure 6: Theoretical framework for the study. Source: from Creswell, 2009, p. 63

3.3 Research Methods

The methodological framework for the research is shown in Primary and *Secondary*

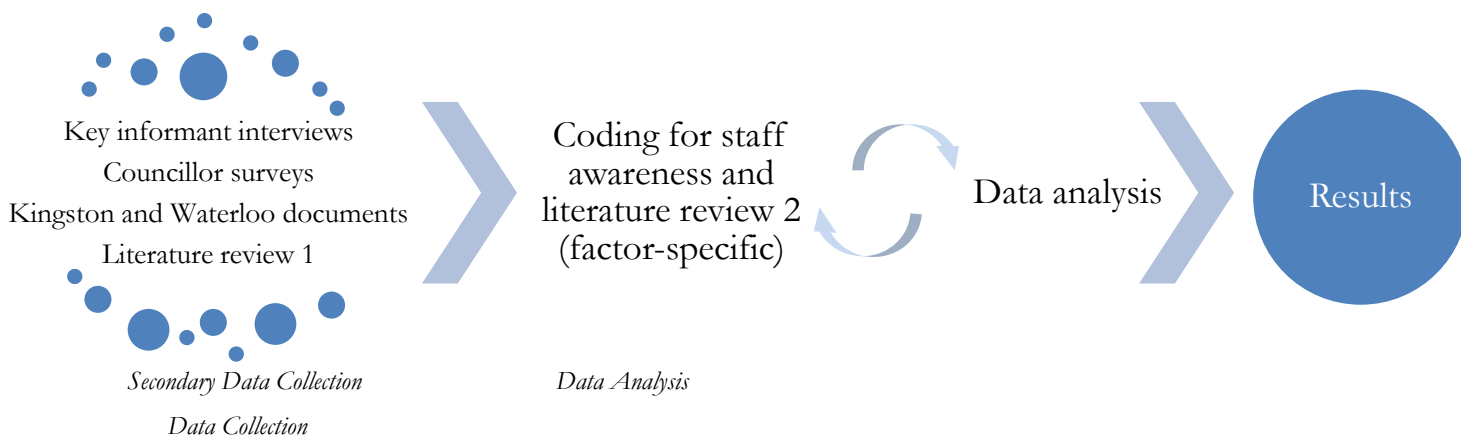


Figure 7.

Figure 7: Methodological framework for the study

Figure 7 displays an overall linear process from data collection to the formulation of results, conclusions and recommendations. Due to the inductive approach, the process was cyclical between stages two and three (collecting relevant literature, coding and synthesizing data to compare/contrast with the literature, considering and reconsidering conclusions). The stages in Figure 7 are discussed below.

Primary and Secondary Data Collection

Study Sites and Key Informant Interviews

The study sites and participants were selected by purposeful sampling, as explained in Chapter 1: both sites are mid-sized municipalities that are undergoing major transit projects, they share some municipal characteristics while differ in others, and data on each site were available to the researcher. The methods and results presented in this thesis can also be applicable to other mid-sized municipalities, as described in Chapter 5. The researcher collected personal observations from visiting each municipality, riding on the transit systems, and learning about challenges, opportunities and future plans for transit operations.

For the interviews, transit planning staff and other municipal staff were invited to participate in approximately one-hour-long interviews by phone and in person at their place of work. Participants were selected due to their intimate knowledge of transit operations and planning within each municipality. They were asked to offer their own knowledge and opinions of transit in each site. Interviews were structured yet conversational, meaning that the majority of questions were pre-determined while extra questions were added when further details were desired. Interviews were audio recorded and then transcribed in Microsoft Word. The interview questions are in Appendix 1. The following list provides the current work position of each interview participant, as well as the identifier assigned to each person:

Kingston

Participant K1 – Commissioner of Corporate Services, City of Kingston

Participant K2 – Service Planner, Kingston Transit
Participant K3 – Project Manager, Kingston Transit
Participant K4 – Director of Corporate Assets, City of Kingston

Waterloo

Participant W1 – Supervisor of Transit Development, Grand River Transit
Participant W2 – Principal Planner, Grand River Transit
Participant W3 – Manager of Transit Development, Grand River Transit
Participant W4 – Transit Planner, Grand River Transit

Councillor Surveys

Council members were invited to fill out a paper survey regarding their insights into transportation issues in their respective municipality. Councillors were chosen as participants because they make up the policy-forming and decision-making body of the municipal government, and therefore are responsible for directing transit policies and approving transit projects. Thirteen surveys were hand-delivered to Kingston's City Council Office and 16 surveys were hand-delivered to Waterloo's Regional Council Office. Each survey was provided in a self-addressed stamped envelope with an overview of the research study, purpose of the study, explanation of why councillor opinions were being sought, and instructions for completion. Survey results were recorded verbatim into Microsoft Excel. The survey questions are in Appendix 2. Four responses were received from Kingston City Councillors (response rate 31%) and five responses were received from Waterloo Regional Councillors (response rate 31%). The following list provides the identifier assigned to each person, including the number of years each has been a councillor and lived in their respective municipality.

Kingston

Councillor KC1 – City councillor for 3 years; Kingston resident 21 years
Councillor KC2 – City councillor for 4 years; Kingston resident 16 years
Councillor KC3 – City councillor for 6.5 years; Kingston resident 54 years
Councillor KC4 – City councillor for 6.5 years; Kingston resident 54 years

Waterloo

Councillor WC1 – Regional councillor for 16 years; Waterloo resident 59 years
Councillor WC2 – Regional councillor for 10 years; Waterloo resident 45 years

Councillor WC3 – Regional councillor for 28 years; Waterloo resident whole life

Councillor WC4 – Regional councillor for 20 years; Waterloo resident 60+ years

Councillor WC5 – Regional councillor for 13 years; Waterloo resident 68 years

Kingston and Waterloo Documents

Municipal documents were used in order to provide the context and operating environments of transit and to determine possible ridership factors. Major sources include staff reports, council minutes and other internal reports related to land use planning, transit operations and strategic planning, demographic trend analysis, growth planning and parking policies.

Literature Review 1

The initial scan of literature completed for this study was generally to determine the usefulness of a study that identifies ridership factors and to see what others had written on the topic. It was also done to ensure the uniqueness of the thesis topic for the two selected study areas. Peer-reviewed journals and reports and local newspaper articles were the primary sources of literature in this stage.

Secondary Data Collection and Data Analysis

Coding

As each section of the Results Chapter was being written, the relevant interview questions were analyzed. For example, question 9 asked participants to rank a list of factors associated with transit ridership from 1 to 6; the transcribed interview text was then copied into a separate Microsoft Word document. Each participant's rankings were input into a summary table. When feasible, these numeric rankings were averaged to aid in understanding the overall response to a factor. The coding process was completed for interview questions 9, 12, 13, 14 and 16, which are the questions that explicitly asked participants to rank factors according to their perceived influence on ridership. These results are described in Chapter 4. In addition to the tables, interview quotes were used within the Results Chapter to add contextual information to the numeric results in the tables.

Due to a low survey response rate, responses from surveys were not averaged among participants so as not to make any statement about the average, or overall, opinions held by all councillors. Instead, councillor responses were quoted in relevant sections of Chapter 4.

Literature Review 2

The majority of the literature review is in this stage. For the analysis of each ridership factor, related literature was sought to determine significance of the factor on transit ridership in general, future trends, and what is written specifically about Kingston and Waterloo. Literature sources are varied and include (in approximate order of usage): peer-reviewed journal articles and other academic papers, Kingston- and Waterloo-produced reports, newspapers and other media sources, books, government publications, industry reports, Statistics Canada, master theses and magazines.

Data Analysis and Results

After completing the coding of primary research data, literature reviews, and comparisons between the literature and primary data, a graphical matrix summarizes the results of each factor. Figure 8 introduces the matrix that is used throughout Chapter 4. It provides the key analysis of the factors presented in the thesis, as it indicates the importance of each factor on the municipality's transit ridership and the municipality's level of response to the factor. Below the matrix is an explanation of how to read across the rows and down the columns.









<i>Data Sources:</i>		<i>Key informant interviews</i> <i>Councillor surveys</i>	<i>Official plans</i> <i>Transportation master plans</i> <i>Other municipal policy plans</i> <i>Provincial policies and guidelines</i>	<i>Observations</i> <i>Staff reports</i>
Municipality's Level of Response →		Staff Awareness (knowledge of factor and its influence on ridership) 	Policies/Guidance (statements about how to plan for, manage or mitigate factor) 	Implementation (funding and execution of transit programs relating to factor) 
Impact of Factor on Transit Ridership ↓				
<i>CUTA annual transit statistics reported by Ontario transit agencies</i> <i>Kingston and Waterloo documents</i> <i>Other literature</i>	 Factor has strong positive impact on ridership			
	 Factor has weak positive impact on ridership			
	 Factor has weak negative impact on ridership			
	 Factor has strong negative impact on ridership			
	 Factor has very weak or no impact on ridership			

Figure 8: Data analysis matrix to present summary of results for each ridership factor

The data sources for the rows and columns are presented to show which data sources were used to analyze the ridership influence of factors and the municipality's level of response to the factors. These data sources are the same as those for each external factor as described in Chapter 1.

The rows of the matrix show graphically the influence of each factor on ridership. Differently sized plus and minus signs are used to denote the impact that each factor has on transit ridership in each municipality. For example, if a factor is expected to contribute to greatly increased ridership in Kingston or Waterloo over the next 10 years, then a large plus sign symbolizes this relationship. If a factor is expected not to have any influence on ridership over the near future, the donut-shaped symbol is used to denote this. The selection of graphics to summarize the relative impacts of each factor will be justified in the individual analysis portions of Chapter 4.

The columns of the matrix show the municipality's level of response toward each external factor. The "response" is measured in three ways: staff awareness, policies/guidance materials, and implementation of initiatives. Symbols are used for each measure to indicate whether the municipal response is appropriate (for which the relevant section of the symbol is filled in) or not appropriate (for which the symbol is blank). Appropriateness is determined according to the influence (plus and minus signs) that the factor is expected to have. The response of the municipality is measured by:

1. Red pie section: Firstly, staff and councillors' general awareness, as measured by the interviews and surveys, of critical external factors and the influence (positive, negative or none) on local ridership. Secondly, their specific awareness of significant factors as related to each municipality's major transit projects – Kingston's transit network redesign and Waterloo's rapid transit.
2. Green pie section: Policies or guidance documents, in particular the official plans and transportation master plans, that make references to factors and provide strategies to manage them. These policies are also compared to literature best practices where appropriate.
3. Blue pie section: Implementation of transit initiatives and funding allocations related to the factor.

As an example, if it is determined based on the literature that students are an important source of ridership for Waterloo (based on documents showing strong growth in student ridership), and

Waterloo staff have a high level of awareness of the region's student ridership trends, then this is an appropriate level of awareness for the student factor. The red pie section would be filled in for Waterloo under the factor "Students". On the other hand, if student ridership is not very important to the region's ridership (perhaps due to a low percentage of students in the region overall), but staff have actually indicated that this is an important factor and expensive projects are being implemented to attract more students, then this would be an inappropriate response to the student factor. The level of response indicates a possible waste of resources for this non-influential factor. Therefore, the red and blue pie sections would be left blank for Waterloo under the student factor.

By looking across and down to a particular cell within the matrix – depending on the importance of the factor and the level of responsiveness a municipality has toward it – this indicates the level of priority that the municipality should place on the factor. It shows where government resources (financial, staff, council, human resources, etc.) should be focused when developing transit services and strategies. In Chapter 5, conclusions about the influence of each factor on ridership in the municipalities are provided. These are followed by recommended planning responses.

Validation of Data

Due to the researcher's personal involvement in transit projects in both the City of Kingston and Region of Waterloo, possible bias may have been introduced when interpreting the primary research. To minimize the potential for bias, a number of validation strategies were employed, as follows.

- Triangulation – in order to test the validity of interview and survey findings, which are purely the opinions of the research participants at the time of data collection, multiple third party and objective data sources were used. These include Kingston and Waterloo municipal planning documents and staff reports, local newspaper articles, Canadian Urban Transit Association (CUTA) statistics originating from mandatory reporting requirements by transit agencies, Statistics Canada reports, and peer-reviewed literature. For example, Waterloo respondents indicated that an aging population may or may not be significant to transit ridership in the next 10 years. To further determine the effect that an aging population may have in Waterloo, newspapers and regional staff reports on the subject were reviewed to

either help support participant information or provide a different perspective on the trend and what it could mean for transit servicing.

- Member checking – each transcription was supplied to the participant to give him or her the opportunity to review their responses and provide clarifications or corrections.
- Presenting negative information that may run counter to the themes – the findings are intended to create an accurate description of which factors are at play in the city and the region. This will be most helpful to transit planners when they decide where to focus their resources.
- Peer debriefing – by nature of the thesis writing process, the researcher’s advisor and committee members serve as qualified peers who review, ask questions and provide additional interpretations about the study.

Chapter 4: Results

4.0 Chapter Outline

Chapter 3 presented the research methodology and provided the study's data analysis matrix for determining the ridership impacts of external factors and the municipalities' levels of response to the factors.

The objectives of this chapter are to:

- Present the factor-specific literature and data analysis of each factor's level of influence and each municipality's level of response. Each factor's section contains:
 - Literature related to the factor and its influence on ridership
 - Findings of Kingston and Waterloo, presented in the order: current conditions; staff awareness; policies and guidance documents; and implementation
 - Data analysis matrix, which summarizes the findings of Kingston and Waterloo
- Summarize the Kingston and Waterloo findings for all of the factors analyzed

The presentation of the external factors is in the following order:

- Population growth and density
- Demographics: seniors, students, immigrants
- Regional location
- Federal and provincial impacts
- Fuel prices

The detailed presentation and explanation of the interview and survey results are found in Appendices 3 and 4. The most relevant portions of these results are discussed in the Staff Awareness paragraphs in this chapter.

4.1 Population Growth and Density

Literature

The population characteristics growth and density are very important considerations in the planning and operating of municipal transit service. In the Transit Cooperative Research Program literature reviewed in Chapter 2, the impact of population growth was a quite significant factor affecting transit ridership due to the simple fact that a larger population translates to a larger market base. A municipality of 500,000 people has 500,000 potential transit users, while a municipality with only 5,000 people has 5,000 potential users. A Texas Transportation Institute report explains the importance of population growth and its effect on the potential transit market. The report, which evaluates proposed corridors for a rail transit project, indicates that population projections (for 2030, 2040, 2050 and 2060) along each travel corridor are “a measure of the market size from which ridership on a state-wide rail or express bus network will be drawn” (Morgan, Sperry, Warner, Protopapas, Borowiec, Higgins & Carlson, 2010, p. 27).

In addition to enlarging the transit market base, a larger population also typically worsens traffic congestion in urban areas. Severe traffic congestion is a problem in nearly all major metropolitan areas of the U.S., causing lost productivity, higher fuel costs, more pollution and aggravation (Crislip & Bush, 2010, p. 26). When too severe, congestion can instigate the consideration of other modes, such as transit, by travellers.

Population density is also important, perhaps even more so than straight population growth. It is a measure of the number of people or jobs per unit of land (acre or hectare). More so than the absolute population number, density gives an indication of how residents live and work – whether in highly concentrated areas or widely dispersed suburban or rural areas. Simply put, “public transit makes money in the core; it loses money in the suburbs” (Foot, 1996, p. 182) as it can reach more revenue-paying customers per vehicle mile in high density areas. Labrecque (1998, p. 53) and Yago (1984, p. 12) agree: the level of transit service a municipality provides is the outcome of its spatial characteristics; to maximize the efficiency of the service provided, the bus must be routed through densely populated areas.

The following empirical evidence helps to illustrate the role population density plays in transit ridership. Figure 9 shows the relationship between transit ridership and urban density in New York City. Reading across the graph, for each measure of density on the horizontal axis there are three bars – trips made by a high income group, trips made by a medium income group and trips made by a low income group. The important message of the graph is that, as residential density increases toward the right side of the graph, the number of trips made by auto (brown bar) decreases among all income groups and the number of trips made by bus and subway (yellow and green bars) increases. If it can be assumed that all modes are relatively equally available across the density categories, the graph shows that higher density development encourages different travel behaviour.

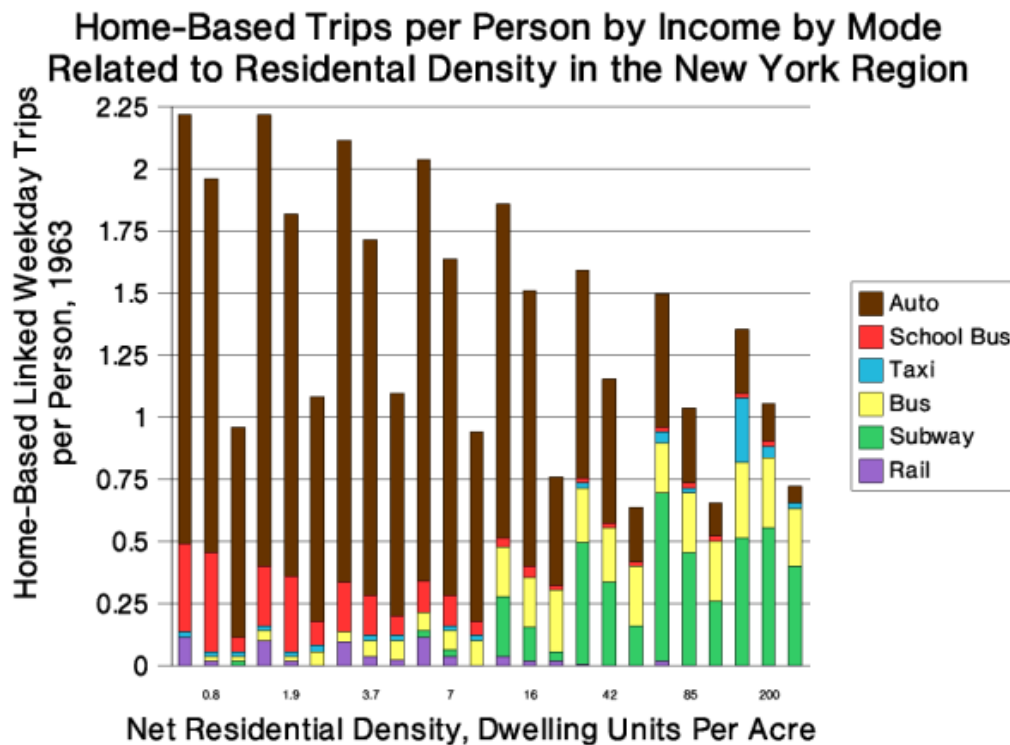


Figure 9: Residential density and trips by mode for high, medium and low income groups. Source: Pritchard, 2007

A number of studies have attempted to identify thresholds for density – points around which mode share changes quickly. Many of the studies’ conclusions provide similar thresholds, while cautioning that they are guidelines rather than firm numbers for planners and policymakers

when looking at residential densities in specific cities. The findings of Pushkarev and Zupan’s 1982 study and the recommendations of the Institute of Transportation Engineers (1989) are cited in TCRP Report 16 (1996, p. 15), and are presented in Table 3.

Along with the density thresholds, TCRP Report 16 indicates that it is important for planners to consider other things, including the cost at which transit service can be provided and the mix of services along the transit corridor.

Table 3: Residential density thresholds for transit service levels

Service Levels	Residential Density Thresholds
Pushkarev and Zupan:	
Bus: Minimum service (20 buses/day)	4 dwelling units/acre (9.9 units/ha)
Bus: Intermediate service (40 buses/day)	7 dwelling units/acre (17.3 units/ha)
Bus: Frequent service (120 buses/day)	15 dwelling units/acre (37.1 units/ha)
Institute of Transportation Engineers:	
1 bus/hour	4-6 dwelling units/acre (9.9-14.8 units/ha)
1 bus/30 minutes	7-8 dwelling units/acre (17.3-19.8 units/ha)

These thresholds will be applied later in the Kingston section.

The literature presented above reviewed the importance of two characteristics of the external factors population growth and population density on municipal transit ridership. It also introduced the density thresholds that will be used below to compare with Kingston’s land use policies. The following paragraphs discuss Province of Ontario literature that provides guidance on what a municipality can do internally in response to conceivable population growth and density issues. Specifically, the municipal guidelines are for land use development policies. The guidelines are then applied to Kingston and Waterloo to determine how their policies match with provincial recommendations.

Municipal land use policies regulate land development within the municipality’s borders. Such policies can either support transit use or discourage the use and efficient operation of transit. The Ontario Ministry of Municipal Affairs and Housing (MMAH) and Ontario Ministry of Transportation (MTO) compiled the Transit Supportive Land Use Planning Guide in 1992 to provide suggestions and advice for how municipal planners (as well as developers, engineers,

transit operators, politicians and others) can promote transit provision and use through policy and practice. Specifically, Guideline 4.3.1 of the guide, called Develop the Policy Framework for a Transit-Supportive Urban Structure in Official Plans and Secondary Plans (MMAH/MTO, 1992, pp. 75-76), provides an easy to follow list of 12 policy recommendations specifically for a municipality's land use policy documents, such as official plans. While the MMAH/MTO guide is 19 years old, its land use and transit policy recommendations are consistent with the requirements of the 2005 PPS and 2006 GGH Growth Plan, as well as with a 2009 document published by MMAH and the Ontario Professional Planners Institute, titled Planning by Design: A Healthy Communities Handbook.

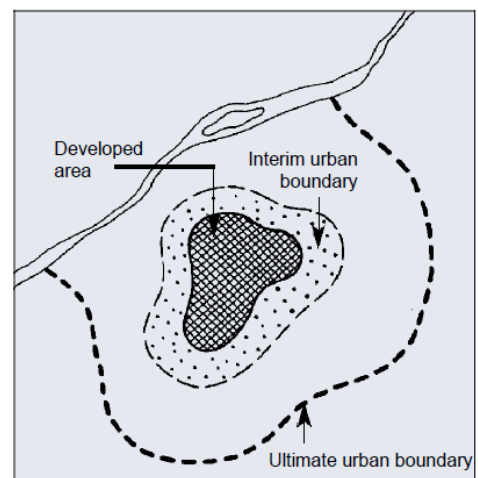
The 12 recommendations are as follows.

General policy statements:

1. General statement about the role transit is seen to play in the community.
2. Municipality's rationale for and commitment to incorporate transit and transit user needs into the planning process.
3. Establishment of a development review process that formally gives the transit agency an opportunity to comment on proposed plans and request changes, and to participate in consolidation and enforcement of final changes recommended by the municipal planning department.

Goals, objectives and specific policies:

4. Establishment of ultimate and interim urban boundaries to reduce urban sprawl and encourage compact urban development. An ultimate boundary is designed to be in place over the long term, in which development is limited. An interim boundary provides a short-term phased-in approach whereby development is first contained within the interim boundary before being permitted outside of it. The interim boundary encourages urban growth to occur in a compact, logical fashion, which supports higher levels of transit service.



5. Establishment of target development densities for employment and residential uses within urban areas that are sufficiently high to support desired levels of transit service.

The guideline refers to the same threshold guidelines specified above from Pushkarev and Zupan. It also indicates higher density development should be adjacent to transit routes.

6. Incorporation of a full range of housing types and land uses within urban area to reduce the need for inter-urban commuting.
7. Designation of one or more mixed-use, high density “activity nodes” in the urban area, which should be located at major intersection points in transit system. Similar to recommendation 6, this increases the convenience of transit since one single-seat bus ride brings a passenger to a location with many amenities. Activity nodes should also be planned where bus routes intersect, at transit stations, at trip generators like malls, and in the downtown.
8. Designation of major transit routes as medium density, mixed-use “activity corridors”. This recommendation formalizes certain corridors as targeted areas for development that will be transit-supportive. Mixed use development incorporates a variety of commercial, retail, residential, industrial, institutional, recreational and cultural uses.
9. Designation of a comprehensive network of arterial roads, collector roads and major transit routes in policy documents. Policies should require high density development along arterials to encourage transit-friendly road network designs.
10. Location of land uses frequented by transit-dependents or mobility-impaired people should be located adjacent to transit stops. Transit-dependent uses include seniors’ residences, high schools, universities, hospitals, community centres and social services.
11. Adequate spacing of arterial and collector roads to accommodate the needs of transit operators. There should be a balance of spacing roads far enough apart to avoid overlapping bus route coverage, and close enough together to reduce average walking distance to a bus stop. Policies should specify maximum and minimum distances. The recommended maximum spacing is 1 kilometre, which would place most land within a 400 metre walk to a bus stop. 400 metres is the generally accepted maximum walking distance for transit passengers.
12. Policy indicating that a significant majority (e.g. 90%) of residences, jobs and other activities/uses should be located within a 400 m walking distance of a transit stop.

The following sections evaluate the influence of population growth and density on Kingston's and Waterloo's transit systems. The current conditions of population characteristics, staff awareness of these characteristics, policies for growth and density, related budget items and implementation of initiatives are explored.

City of Kingston

Current Conditions

Kingston is a slow-growth city. Its growth rate of 2.6% between 2001 and 2006 (0.52% per year) "lags behind" that of nearby mid-sized cities and the province: Belleville's growth rate is 4.7%, Peterborough's is 5.1% and the Ontario average is 6.6% (City of Kingston⁵, 2009, exec. summary, p. 1). The projected 2026 population is 133,100 residents and the per-year growth will increase slightly from 0.52% to 0.65% if this forecast is realized. Over 2001-2006, the urban core experienced little or no population growth while new suburbs and rural areas around the city experienced the largest growth, partly due to families moving from the core to suburban homes. Suburban sprawl and urban decay may continue in the core if efforts are not made to rejuvenate the downtown (City of Kingston⁵, 2009, chap. 1, p. 1).

Shown in Figure 10, the highest concentrations of residents are in or near the downtown core, with pockets of higher density in northern and western residential areas. The western and eastern areas are planned for growth; generally, the city is expanding westerly, north-westerly and easterly into primarily rural land.

A large area to the west of Little Cataraqui Creek, between the eastern downtown areas and western residential areas, is very low density. Residential, commercial, institutional and industrial land uses, along with some open space and environmental protection areas, characterize this "low density gap." Along Bath Road, the east-west arterial that runs through the low density gap, Kingston's transit buses must travel approximately three kilometres to reach higher density areas and larger transit markets. New markets could be created if the gap was redeveloped into residential or commercial uses. Furthermore, if the redevelopment were higher density, this would allow the transit agency to operate more efficiently in the Bath Road corridor.

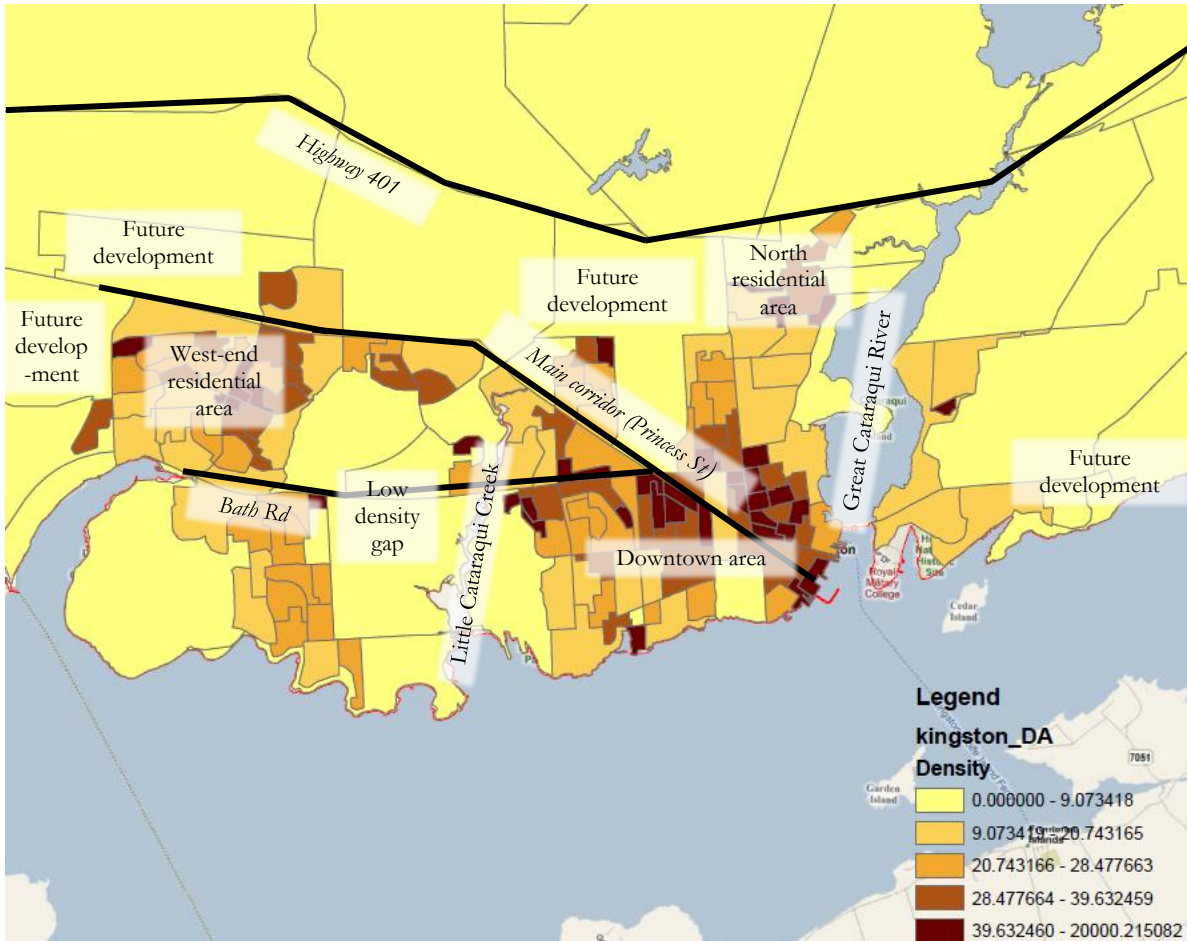


Figure 10: Kingston population density map. Statistical source: Statistics Canada, 2006

While Figure 10 shows current densities,

Figure 11 reveals changes in population between the 2001 and 2006 censuses. Illustrated is a clear movement outward from the core into suburban and rural areas. This is concerning from a transit perspective because the major transit market, urban residents, is being lost to a less reachable suburban and rural populace. A benefit that can be observed is that the aforementioned low density gap experienced population growth on the order of 11-20%. This growth may help transit service reach the west side the city more efficiently. Nevertheless, the trends in Figure 11 demonstrate a strong need to focus on intensifying the urban core to pre-empt more residents from moving to the suburbs and pulling businesses and services with them.

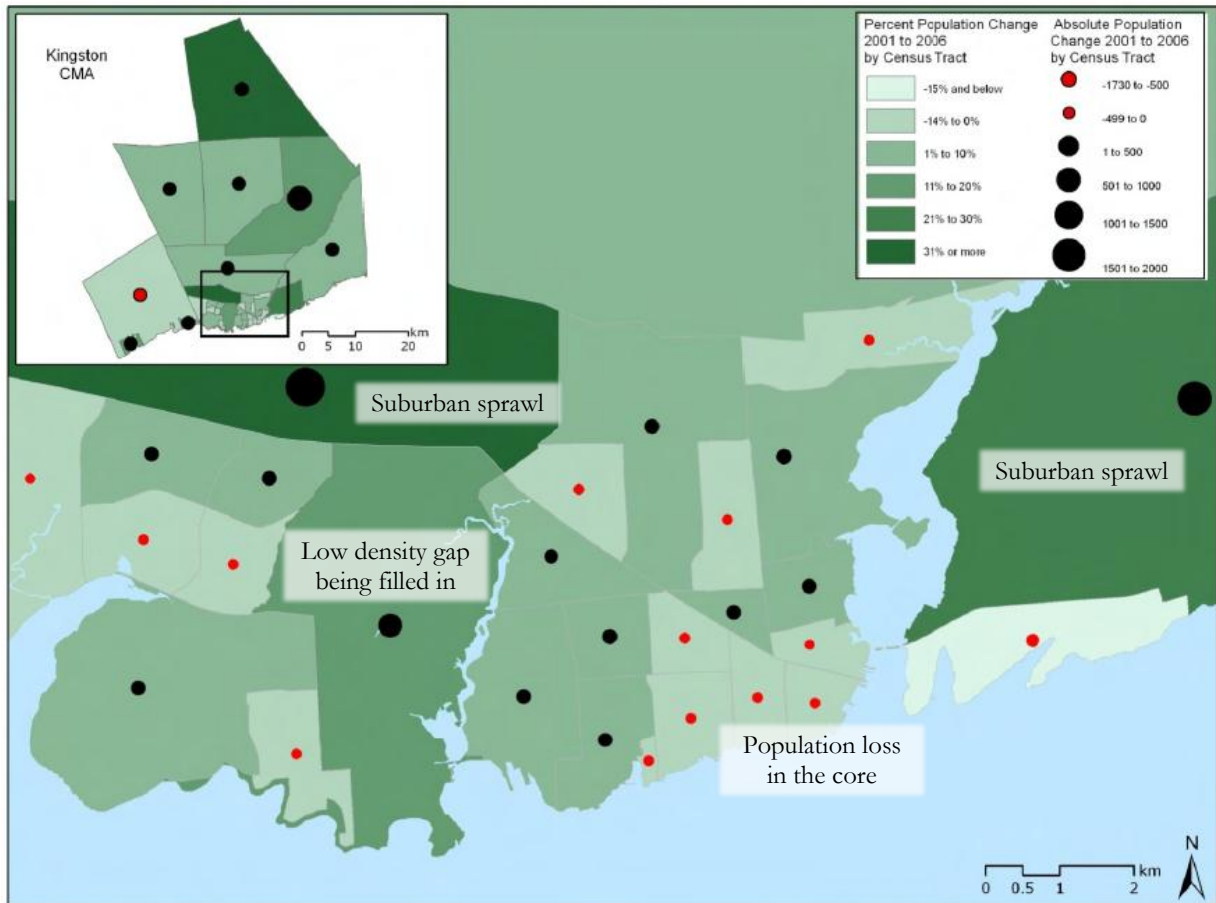


Figure 11: Population changes (percent and absolute) in the City of Kingston, 2001-2006. Source: City of Kingston⁵, 2009, chap 1, p. 2

The slow population growth and indicators that the city’s density is decreasing (movement to outer areas) suggests that this factor is expected to have low impact on ridership. However, the impact is expected also to be positive since the population is growing (rather than retracting or stagnating).

Staff Awareness

The Kingston interview respondents gave population growth a low score in interview questions 9 and 13 (Figure 42 and Figure 44 in Appendix 3). Question 9 asked respondents to rank the most important factors that led to the undertaking of the transit network redesign project – with 1 being the most important factor and 6 being the least important. Among the four respondents, the “population and growth forecasts” factor was ranked an average of 4.25 out of 6, or the second least important out of the six factors listed. Question 13 asked respondents whether they believed each factor listed was going to be significant or not significant to transit ridership in the

city over the next 10 years. The factor “population increases” was given a Not Significant score from all four respondents. Interview respondent K4 said, “I don’t think [population and growth forecasts] is driving Council so much.” Respondent K2 thinks, “what will be more significant is our ability to attract the riders that we don’t have now, not so much the population increase.” These interview results are consistent with the Current Conditions section above, which demonstrates Kingston’s low growth potential.

Regarding land development proposals and density policies, Kingston staff lack certain tools to ensure that new developments are transit-friendly. When KT is invited to comment on development applications, K3 wishes they had a Council-approved transit-oriented policy that helps staff make appropriate comments. The lack of such a policy or guide results in inconsistent and anecdotal feedback to different developers, according to K3, and it hinders the forcefulness with which KT staff can propose their comments on applications. K3 also cited a shortage of technical understanding of transit within the group of staff that provides transit comments on development proposals. Comments on each proposal are made somewhat piecemeal. This can hinder an overall, long-term awareness of the way the city’s transit system and built form fit together.

In the surveys with city councillors, when asked why the city’s transit network redesign project was undertaken, population growth was not mentioned, which is consistent with the interview results. Regarding population density, there are varying levels of understanding connecting transit ridership with density and land use planning. One councillor (KC4) makes this connection well, saying that big box shopping centres have been a very negative influence on ridership and that residential growth in the west end of the city has been a somewhat negative influence. However, councillor KC2 believes that west end growth can have a very positive influence on ridership if Kingston Transit can shorten the travel time of a trip to downtown to less than an hour. This may be true, but it is important for councillors to recognize, as KC4 does, that the further out the city develops the harder it becomes for its conventional transit system to provide high performing (very fast) service to downtown. Councillor KC4 points out that residents enjoy relatively short driving times – only 15 minutes typically. It is difficult for even a high performing transit system to compete with that.

Regarding transit performance, councillors' comments pertain to improving specific aspects of transit, such as frequency, reliability, travel times, directness of routes, rudeness of drivers, and special events bus shuttles. These comments suggest councillors believe KT's low ridership is caused solely by transit system performance; they do not recognize that the city itself is set up to favour car travel. The understanding of the land use and density planning connection is missing.

In the absence of significant expected population growth, Kingston is missing one of the strongest impetuses to improve its transit service. Staff and councillors may not be focusing enough on the need to increase land use density and direct growth to existing built-up areas.

Policies/Guidance

Some of the City's land use policies continue to encourage outward growth into rural areas, thus promoting lower urban density. One such policy is the City-commissioned Urban Growth Strategy 2004. This strategy provides a review of the growth issues faced by Kingston and an approach to growth management to the year 2026. The strategy was used in the development of the City's 2010 Official Plan. It is expected that the Urban Growth Strategy will exacerbate the outward movement of residents, similar to the observed increase in suburbanization between 2001 and 2006. According to the strategy, the development yield potential of the city's existing urban area (essentially the area below the yellow line in Figure 12) will be insufficient to meet the projected 11% population growth to 133,100 residents by 2026 (City of Kingston⁴, 2009, p. 2; City of Kingston⁶, 2004, p. 4). To accommodate the growth, the strategy identifies undeveloped areas that are suitable for development. There are seven such areas, called Growth Alternatives (GA), which are shown as the coloured areas in Figure 12.

The yellow line in this map indicates the Urban Boundary designated in the OP. The Urban Boundary is a growth boundary intended to limit development beyond it. The OP intends for the boundary to help curb urban sprawl, intensify existing built-up areas and support transit. Four GAs are contained within the Urban Boundary: GA1 West (which is inside the density gap discussed above), GA1 East, GA2 West and GA2 East. However, GA3, GA4 and GA5 are outside of it.

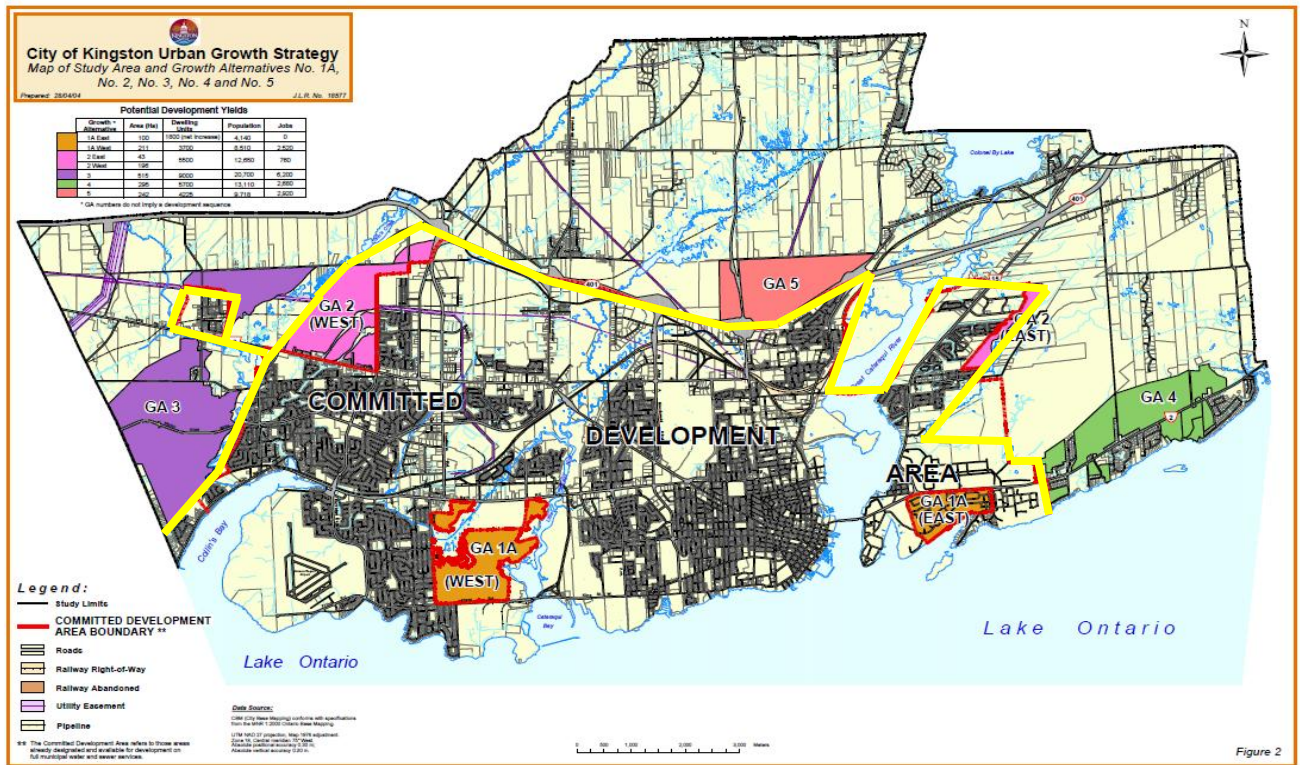


Figure 12: Growth alternative areas and urban growth boundary in the City of Kingston, 2004 and 2010. Source: http://www.cityofkingston.ca/pdf/urbangrowth/UGS_DraftFinalReport_Fig2.pdf

The literature indicates that transit benefits from high density development. However, by planning for growth in GAs that are outside of Kingston’s growth boundary, it seems the intents of the Urban Boundary could be undermined. Suburban development would continue to spread outward into rural parts of Kingston. This policy is not beneficial for transit operations and ridership.

A way to alleviate some negative transit impacts of planned urban sprawl is to make the densities of new suburban developments, which are typically low density, higher, or at least high enough to justify transit service. Otherwise, it becomes more difficult for the transit agency to stretch bus routes into these areas while providing a competitive frequency and travel time for commuters.

The predicted land areas and development yields of the GAs are provided in Figure 12. Using these figures, the residential densities are calculated below and are compared to the thresholds

determined by Pushkarev and Zupan and the Institute of Transportation Engineers (ITE) in Table 3.

GAs inside yellow line:

GA1A West – 17.5 dwelling units/ha

GA1A East – 18.0 units/ha

GA2 West – 28.1 units/ha

GA2 East – 127.9 units/ha

GAs outside yellow line:

GA3 – 17.5 units/ha

GA4 – 19.3 units/ha

GA5 – 17.5 units/ha

Since most of Kingston’s bus routes operate with a headway of 30 minutes (service frequency of 2 buses per hour), the Pushkarev & Zupan density thresholds for “intermediate service” – 17.3 units/ha – and the ITE thresholds for “1 bus/30 minutes” – 17.3-19.8 units/ha – are used for comparison to the densities of Kingston’s GAs. All the GAs meet these minimum thresholds, with five being at or very close to the minimum and two being well over the minimum. This means the new GAs that have been slated for suburban development will have a residential density sufficient to justify bus service from an operational efficiency standpoint. However, the three GAs outside the Urban Boundary have only minimal density potential, which may exacerbate sprawl and limit the propensity for residents in these areas to use transit.

As mentioned, Kingston’s Official Plan contains an urban growth boundary that is to be in place for the life of the OP (between 2010 and 2026). However, its boundary is somewhat “soft” as it is not intended to be a permanent boundary, which then undermines the ability of the boundary to limit outward development. The MMAH/MTO Transit Supportive Land Use Planning Guide recommends both soft (interim) and hard (permanent) boundaries. The Kingston OP does not contain permanent boundaries. This and the other 11 MMAH/MTO recommendations are applied in Table 4 below to the Kingston OP. Out of the 12 recommendations, the Kingston OP fulfills five, does not fulfill four, and partially fulfills three of them.

Table 4: MMAH/MTO transit supportive land use planning guidelines and their applicability to Kingston’s Official Plan

MMAH/MTO Policy Recommendation	Present in Kingston OP?	Summary of Associated Policies in Kingston OP
General policy statements:		
(combined) 1. General statement about role transit plays in community and 2. Municipality’s rationale for and commitment to incorporate transit into planning process	NO NO	OP does not provide rationales for role of transit or high level goals that include transit use in city. Section 2, which outlines OP’s strategic policy direction, is where transit could be incorporated into statements about desired community development. Section 4 (infrastructure and transportation policies) could clarify importance of transit by explaining why improved transit infrastructure is necessary. Related specific policies: 2.1, 2.3, Section 4
3. Establishment of development review process allowing transit agency to comment on proposed plans and participate in enforcement of final changes	YES	OP follows recommendation. Three policies require transit to be considered during reviews of development application, site plans and plans of subdivision. Related specific policies: 2.1.7(d), 9.5.32(d) and 9.6.4(b)
Goals, objectives and specific policies:		
4. Establishment of ultimate and interim urban development boundaries	PARTLY: SOFT BOUNDARY TO 2026	Recommendation is partly followed due to establishment of “soft” (limited term to 2026) urban boundary. Policies direct most growth inside Urban Boundary to promote transit and increase land use density. However, permanent boundary is not in place. Furthermore, OP plans for development of areas outside Urban Boundary, so continued outward development may undermine efforts to improve transit ridership. Related specific policies: 2.1.2, 2.2.4
5. Establishment of target development densities for employment and residential uses	YES	Policy sets residential density targets of 22 units/ha for overall minimum density, 37.5 units/ha in greenfields and for large-scale developments, and 75 units/ha along Princess St corridor. These targets fall in line with thresholds in Table 3. Related specific policy: 2.4.3
6. Incorporation of full range of housing types and land uses to reduce need for inter-urban commuting	YES TO MIXED LAND USES NO TO MIXED HOUSING	Recommendation is partly met. While some policies explicitly prohibit mixing housing types, a good number of policies require mixed land uses. Related specific policies: 2.1.2, 2.1.3, 2.1.4, 3.3.B.5 and 3.3.C.5

MMAH/MTO Policy Recommendation	Present in Kingston OP?	Summary of Associated Policies in Kingston OP
	TYPES	
7. Designation of one or more mixed-use, high density “activity nodes”	YES	<p>OP designates two intensified major centres and two minor centres and Princess St corridor as priority transit route and mixed use activity node.</p> <p>Related specific policies: 2.2.8, 2.2.10, 2.3.3 and Schedule 2</p>
8. Designation of major transit routes as medium density, mixed-use “activity corridors”	YES	<p>Policies support intensification and mixed use adjacent to transit routes, so OP generally follows guideline. However, since OP does not allow mixing of housing densities, it may be difficult to encourage medium density along transit routes in areas that are traditionally low density.</p> <p>Related specific policies: 3.3.8 and 3.4.1</p>
9. Designation of network of arterial roads, collector roads and major transit routes	NO	<p>Recommendation is not followed. Schedule 4 does not indicate major transit corridors or future transit corridors, nor does OP designate such a network.</p> <p>Related specific policy: Schedule 4</p>
10. Location of land uses frequented by transit-dependents or mobility-impaired people should be located adjacent to transit stops	PARTLY: SOME LAND USES SPECIFIED	<p>OP partly follows recommendation as OP generally requires seniors’ residences, corrections facilities and employment areas to be transit supportive and for centres to locate near transit stops. However, missing are policies encouraging other transit-supportive land use types identified in the guideline to be located near transit. These are recreational facilities, retail centres, high schools and universities, hospitals, community centres and other social services.</p> <p>Related specific policies: 3.3.D.1 and 3.3.D.7</p>
11. Adequate spacing of arterial and collector roads to accommodate needs of transit operators (1 km apart maximum)	NO	<p>OP does not include recommended policy as it does not require maximum distance between arterial or collector roads. Moreover, OP restricts number of intersecting streets in order to protect arterials’ carrying capacity (presumably of automobile traffic). Policy further restricts transit accessibility, since transit routes will be required to take more circuitous routes through neighbourhoods to reach passengers.</p> <p>Related specific policy: 4.6.30</p>
12. Policy indicating that significant majority (e.g. 90%) of residences, jobs and other activities/uses should be located within 400 m walking distance of transit stop	YES	<p>Recommendation is followed. Policy plans for transit stops within 300 metres of major activity centres and 95% of urban residences. Policy is better than generally recommended 400 metre maximum walking distance to stops. OP also goes further than MMAH/MTO guideline, saying it will strive to serve 95% of residents within 300 metres rather than 90%.</p> <p>Related specific policy: 4.6.38</p>

The KTMP agrees with the relatively low importance of population growth: “given the history of Kingston’s sporadic growth, future growth projections are uncertain,” so Kingston planners are cautioned to retain flexibility in transit requirements rather than plan for growth (City of Kingston¹, 2004, p. 17). Regarding population density, the KTMP does not provide strategies for encouraging transit-supportive densities in the future, only saying that more service should be provided in existing higher density downtown areas. The City’s primary document outlining transit and transportation policies, then, is fairly silent on one of the most important factors that can have an impact on transit ridership.

The policies for population growth and density, including those in the OP and KTMP, are inappropriate to improve the city’s land use density. This factor is important in terms of supporting transit operation and ridership, so Kingston is missing a key opportunity to make the city more transit-supportive.

Implementation of Initiatives

While population growth is an insignificant factor toward growing transit ridership in Kingston, the City has expanded its transit service. For instance, Kingston’s bus fleet has increased between 2003 and 2009; a larger fleet means that more service and routes can be added either to serve a larger population or to increase frequency on existing routes.

The transit budget growth has been much larger than the city’s population growth: between 2001 and 2011, the capital budget increased 156% and the operating budget increased 16% compared to a 4.8% population growth between 2001 and 2009. This demonstrates the City’s willingness to invest in transit even though the demand for service is not growing at any momentous rate.

While the KTMP does not provide many strategies to link land use density and transit, it suggests increasing service in the downtown. This recommendation has been implemented within the past decade. In 2003, KT added service along a route serving downtown, the Kingston Centre and the student areas around Queen’s and SLC. More service was also added along the high density corridor, Princess St (City of Kingston⁹, 2003). In 2010, a new route was

introduced that connects the downtown and the intercity transit terminals. These improvements help to promote the transit system within the denser parts of the city, which may over time help attract more residents and businesses that wish to be near convenient transit service. This implementation of initiatives and budget increases has been appropriate.

Conclusion

Kingston's population growth is low relative to the Ontario average. It has historically been 0.52% per year and is projected to increase to 0.65% per year over the next 15 years. The distribution of density has become less centralized with residential movement out of the urban core and into the city's perimeter. Therefore, the external factors of population growth and population density is expected to have a minimal effect on transit ridership. This effect is also expected to be positive because of the positive historical and expected growth in population.

There is a clear understanding among staff regarding Kingston's low population growth and its insignificant impact on transit ridership. Regarding population and land use density, there should be a better understanding, particularly among councillors, of the important connections between density and transit ridership potential.

In terms of policies, the Official Plan completely fulfills less than half of the 12 MMAH/MTO land use policy recommendations. A key policy that is not completely fulfilled is the Urban Boundary, which is proposed to be in place only for the life of the OP and is undermined by the Urban Growth Strategy, which plans for somewhat low density development beyond the boundary. Over the long term, a continued outward movement of residents combined with soft urban boundary policies will make it more difficult for transit to operate effectively and attract riders.

Despite the city's historically low population growth, it has increased transit funding at a higher rate than the population has grown. It has also increased service in high density areas. This suggests that the city wishes to continue to improve transit and provide adequate service to existing built up areas, rather than simply expanding service to newly developed areas. These initiatives are appropriate in relation to responding to the factor of population density and promoting transit.

Region of Waterloo

Current Conditions

Waterloo is a growing region. The growth rate between 2001 and 2006 was 9.03% (Statistics Canada, 2006), and the forecasted growth over the next 22 years will grow the region from a mid-sized municipality to a large one. The population will grow from 543,700 in 2010 to 729,000 in 2031. This rate is twice that of the national average (Region of Waterloo⁹, 2009, p. 42), and Figure 13 compares the region's projected growth to that of the country and province.

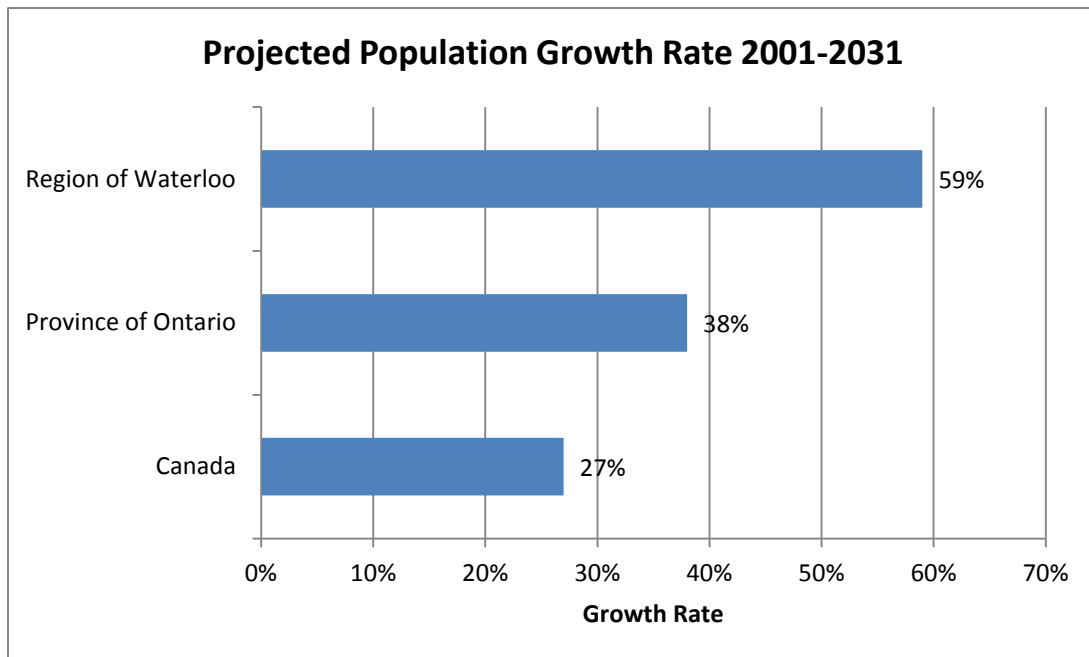


Figure 13: Projected population growth rates for Waterloo, Ontario and Canada. Source: adapted from <http://www.socialplanningcouncil-cnd.org/pdfs/publications/SIGNposts.pdf>

Based on these growth forecasts, as mentioned, the region is on the “verge of becoming a really big city” (Simone¹, 2010). A partner from the planning and design firm Urban Strategies believes that, because of this growth, big city transit options such as light rail will no longer be a choice but a necessity, and that Waterloo will need to become a much more transit-based community than it has been in the past (Simone¹, 2010). Simone notes that the region is growing faster than most other mid-sized cities in Ontario – being only second to Barrie – due to the university presence and that the critical mass of 500,000 residents has already been surpassed. In science,

the critical mass “identifies the point where the presence of sufficient materials or energy makes a process self-sustaining” (Robl, 2011). In transit literature, the critical mass of residents (higher density clusters of a certain number of residents in an area) can support high frequency transit service, as well as to foster vibrant, walkable communities and its retail, commercial and community functions (MMM Group, City of Brampton & City of Mississauga, 2009, p. ES 15). Municipalities with at least 500,000 people are sometimes called “engines of growth” (Fulton, Partridge & Olfert, 2006, slides 5-7). The specific use of the 500,000 threshold comes from North American experience (City of London, 2010, p. 4), where it often takes more significant population density than cities in Europe, for example, to justify the construction of higher orders of transit and to attract drivers to transit.

Along with population growth, intensification will increase significantly in the region. A dwindling land supply combined with an urban growth boundary that is proposed in the Region’s new ROP will help increase urban density.

The housing market trend in Waterloo is increasingly moving toward high density high-rise downtown condominiums. Condominium sales were up approximately 7.8% in 2010 compared to 2009, and they now account for almost one in every five homes sold in the region. Young technology professionals, and others who do not want the hassles of property maintenance such as retiring baby boomers, can be credited for the condo boom. This trend is expected to continue well into the future as land supply dwindles (Simone², 2010).

This factor is expected to contribute to large positive increases in Waterloo’s ridership over the next 10 or so years.

Staff Awareness

Regional staff understand the important role that growth will play in supporting transit. For interview question 9, the population and growth forecasts factor was ranked highly, 2.75 out of 6, regarding the reason that the current rapid transit project was undertaken. For question 13, all four respondents believe that population increase will be a significant factor for transit ridership in the region over the next 10 years. Interview respondent W1 says, “population increase has always driven transit ridership growth here.” Respondent W3 believes the “population and

growth forecasts were critical because this is all about managing growth and quality of life.” Without the expected growth, “the rationale for [rapid transit] would be very challenging because if you’re not growing, how are you going to get the redevelopment and intensification?”

Regional councillors also recognize that forecasted growth will require transit upgrades to grow ridership. Four out of five cite population growth as a reason for undertaking the rapid transit project. The councillors also comment on the need to build a rapid transit line in order to intensify the region’s land uses, otherwise the region faces increasing congestion and the need to build much more road capacity.

Both transit staff and regional councillors understand the role that population growth plays in the region’s ridership and the important link between intensification and transit.

Policies/Guidance

The provincial Places to Grow Plan, which requires a number of municipalities in south-western Ontario to intensify urban areas, requires the Region to reach population and employment density targets: 200 people + jobs per hectare for the Kitchener and Waterloo downtowns, 150 people + jobs per hectare for the Cambridge downtown, and 50 people + jobs per hectare for designated greenfields. People + jobs per hectare refers to the number of residents and jobs combined per hectare that are found within the defined municipal downtowns. It is a measure of the population and employment density in the area. To comply with the Places to Grow Plan, the Region’s ROP contains these density targets.

The 2003 Regional Growth Management Strategy (RGMS) and the 2010 RTMP cite increased density and intensification as key goals to support the future transit network. The RGMS is a long-term framework to outline the desired residential and employment growth patterns in the region. One of the six goals of the RGMS is the intensification of the Central Transit Corridor to support higher order transit and revitalize downtown cores. The RTMP, guided by the P2G, RGMS and ROP, adopts the views to integrate transportation and land use and to support intensification to manage growth (Region of Waterloo⁶, 2010, p. xiii).

As mentioned, Waterloo has an urban growth boundary called the Countryside Line (Figure 14 – identified by black line). It also has a Protected Countryside (Figure 14 – identified by green area). These two designations serve to prohibit outward development into the region’s farm fields and environmentally protected areas. The Countryside Line will be in effect for the length of the ROP (to 2029), while the intersecting boundaries of the Countryside Line and Protected Countryside will create a long-term growth boundary.

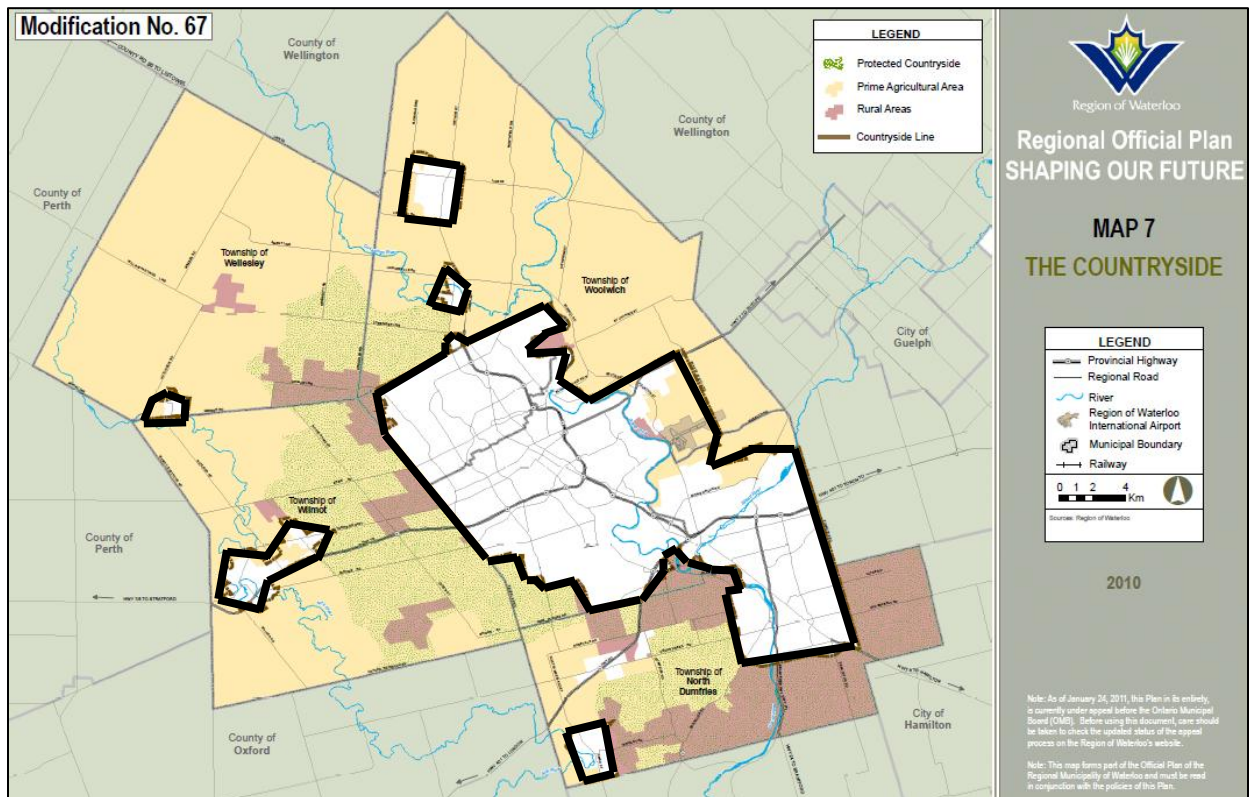


Figure 14: Waterloo Region’s proposed urban growth boundary, the Countryside Line. Source: Region of Waterloo², 2010

The urban growth boundary in Waterloo’s ROP proposes both interim and ultimate boundaries, which follows the MMAH/MTO policy recommendation. Table 5 presents the analysis of ROP policies compared to the MMAH/MTO recommendations. Out of the 12 recommendations, the ROP fulfills nine, does not fulfill one and partially fulfills two of them.

Table 5: MMAH/MTO transit supportive land use planning guidelines and their applicability to Waterloo’s Regional Official Plan

MMAH/MTO Policy Recommendation	Present in Waterloo ROP?	Summary of Associated Policies in Waterloo ROP
General policy statements:		
(combined) 1. General statement about role transit plays in community and 2. Municipality’s rationale for and commitment to incorporate transit into planning process	YES YES	ROP thoroughly follows recommendation in Chapters 1, 2, 3 and 5 (which contain introduction, planned community structure, livability and infrastructure policies, respectively). Role of transit in community structure, larger transportation network and efforts to reduce automobile dependency are made clear to readers. Related specific policies: Chapters 1, 2, 3 and 5
3. Establishment of development review process allowing transit agency to comment on proposed plans and participate in enforcement of final changes	YES	Several policies follow recommendation. They require Region and Area Municipalities to apply Transit Oriented Development and other transit provisions when reviewing development applications. Related specific policies: 2.D.2, 2.D.10 and 5.A.3
Goals, objectives and specific policies:		
4. Establishment of ultimate and interim urban development boundaries	YES INTERIM TO 2029 AND ULTIMATE	Both interim and long-term boundaries are established in ROP, thereby fulfilling recommendation. Policies establish Countryside Line and Protected Countryside (to ROP planning horizon of 2029). Where Countryside Line and Protected Countryside coincide, this creates permanent boundary that disallows expansion of urban development. Related specific policies: 2.B.1, 6.B and Map 7
5. Establishment of target development densities for employment and residential uses	YES	Recommendation is followed as density targets are mandated by Province under Growth Plan, and they are established for downtowns and greenfields. They also improve on Province’s mandate to put 40% of all new annual residential development within existing built-up areas – it establishes target of 45% for Area Municipalities, which exceeds provincial target by 5%. Related specific policies: 2.D.3(e), 2.D.17(b), 2.E.6(b) and 2.C.2
6. Incorporation of full range of housing types and land uses to reduce need for inter-urban	YES	Two policies encourage lot intensification, mixing of housing types and site intensification. Thus recommendation to provide range of housing and land uses is met.

MMAH/MTO Policy Recommendation	Present in Waterloo ROP?	Summary of Associated Policies in Waterloo ROP
commuting		Related specific policies: 3.A.3 and 3.A.5
7. Designation of one or more mixed-use, high density “activity nodes”	YES	<p>There are four major types of activity nodes identified in policies in ROP that satisfy recommendation. They are: 1. Transit Corridors (policies 5.A.8 and 5.A.9, map 5a); 2. Central Transit Corridor Study Area (policy 5.A.10, map 3a); 3. Reurbanization Corridors (policy 2.D.11, map 3a); and 4. Major Transit Station Areas (policy 2.D.6, map 3a). In addition to identifying these primary activity nodes, ROP indicates in policies 2.D.14 and 2.D.15 that Area Municipalities will designate Major Local Nodes in their OPs, which are development clusters near key transit corridor intersections.</p> <p>Related specific policies: policy 2.D.6, 2.D.11, 2.D.14, 2.D.15, 5.A.8, 5.A.9, 5.A.10, Map 3a and Map 5a</p>
8. Designation of major transit routes as medium density, mixed-use “activity corridors”	YES	<p>Policy satisfies recommendation by outlining transit oriented development policies that Region and Area Municipalities will apply when reviewing development applications. Furthermore, policies outlined in previous row, which identify different transit and activity corridors, require higher density and mixed use development along corridors.</p> <p>Related specific policy: 2.D.2</p>
9. Designation of network of arterial roads, collector roads and major transit routes	YES	<p>ROP achieves recommendation by designating transit network, road network and even cycling network in policies 5.A.8 and 5.A.9 for transit, 5.A.22 for roads and 5.A.14 for cycling. The networks are found on maps 5a, 5b and 5c.</p> <p>Related specific policies: 5.A.8, 5.A.9, 5.A.14, 5.A.22 and Maps 5a, 5b and 5c</p>
10. Location of land uses frequented by transit-dependents or mobility-impaired people should be located adjacent to transit stops	PARTLY: SOME LAND USES SPECIFIED; OTHERS IDENTIFIED IN COMPLETE COMMUNITIES CONCEPT	<p>Recommendation is partly followed as some transit-supportive land uses are specified to be located near transit, as in policies 2.G.7 for office and commercial uses, 2.D.2 for high density residential, 3.A.10 for community housing and 3.H.2 for public health and social services. While ROP does not specifically mention other land uses in Guideline 2.4.2 (schools, recreation/community centres, seniors’ homes and hospitals), its complete communities policies such as 2.D.1 help establish self-contained areas with one characteristic being convenient access to transit.</p> <p>Related specific policies: 2.D.1, 2.D.2, 2.G.7, 2.4.2, 3.A.10 and 3.H.2</p>
11. Adequate spacing of arterial and collector	NO	ROP does not comply with recommendation as it does not specify maximum distances between arterial or collector roads.

MMAH/MTO Policy Recommendation	Present in Waterloo ROP?	Summary of Associated Policies in Waterloo ROP
roads to accommodate needs of transit operators (1 km apart maximum)		However, it does call for a road network design that provides for direct and efficient transit routes. Related specific policies: 2.D.17(e) and 5.A.32
12. Policy indicating that significant majority (e.g. 90%) of residences, jobs and other activities/uses should be located within 400 m walking distance of transit stop	PARTLY: % OF RESIDENCES AND JOBS NOT SPECIFIED, BUT POLICIES ENCOURAGE PROXIMITY TO TRANSIT STOPS	Recommendation is partly fulfilled. ROP does not specify percentage of residents that should be located within certain distance of transit stop, but it does outline several policies that encourage developments to be located close to transit stops, and in some policies the actual distance is specified. Related specific policies: 2.D.2, 2.D.6, 2.D.17(f), 2.G.4, 2.G.6 and 2.G.7

Waterloo’s policies are appropriate for dealing with the forecasted increase in population and for encouraging higher density land use, two elements that will be important in the region in the near future.

Implementation of Initiatives

GRT has implemented initiatives that help prepare for growth and grow ridership in the high density corridors of the region. Since 2000, the agency has expanded service regularly and it continues to do so in order to prepare for the forecasted population increase. For example, \$4.5 million per year is budgeted from 2011 to 2018 for new buses, and initial rapid transit funding was budgeted in 2010. The RT project is intended to help curb urban sprawl, encourage development along the primary corridor and attract greater numbers of drivers to transit. The iXpress bus service, which was implemented in 2005, was a significant improvement to the regional network within the primary corridor.

Most recently, Regional councillors have approved a \$5 million transit expansion to launch in June and September 2011 (Outhit², 2011). These improvements, approved in the 2011 budget, are among the first initiatives within the RTMP to be launched. Among the new services is an express route along Fischer Hallman Road in Kitchener and Waterloo; this road is identified as a high density, mixed use transit corridor that is intended to help achieve the Region’s transit modal split targets (The Planning Partnership, 2011, p. 136). Other services include increased

frequency of several routes and redesigned routes in order to improve speeds and support the future rapid transit line.

These initiatives demonstrate an understanding that transit needs to be continually expanded to deal with increased demand, and that the highest density areas of the region should get a high performing transit system (in terms of travel time, frequency and convenience) in order to encourage ridership.

Conclusion

The Region's population is expected to increase to almost $\frac{3}{4}$ of a million people by 2031. This is expected to have a large positive impact on transit ridership. Regardless whether political or public opinion is or is not in favour of transit expansions, the forecasted growth and provincial requirements to increase density are unavoidable and provide the impetus to continue to make transit a priority.







Regional transit staff rank population growth as a strong impetus for transit improvements and a key driver of ridership, both past and present. Staff also communicate an understanding of how to accommodate the growth trends. Councillors make the important connection between transit and land use planning, noting that transit is necessary in order to avoid costly road expansions.

All of the Region's major planning and transportation documents – the ROP, RGMS and RTMP – place strong emphasis on increasing land use density, limiting urban sprawl, and integrating transit and land use. In particular, the ROP achieves most (nine out of 12) of the MMAH/MTO transit and land use policy recommendations. One of the most notable of these, the urban boundary is intended to be a permanent boundary to limit suburban sprawl.

The Region has expanded and improved services that have grown ridership tremendously over the past decade. These improvements continue to be scheduled, such as the rapid transit project and the introduction of new express routes.

Below is the data analysis matrix, first introduced in Chapter 3, which provides a summary of the information presented above regarding population growth and density in Kingston and

Waterloo. The summary for Kingston is shaded orange and the summary for Waterloo is shaded green.

POPULATION GROWTH AND DENSITY			
Municipality's Level of Response →	Staff Awareness	Policies/Guidance	Implementation
Impact of Factor on Transit Ridership ↓			
+	WATERLOO - Population growth is expected to increase significantly and make big impact on ridership as region transitions from mid-sized to large municipality		
	 <ul style="list-style-type: none"> - Transit staff place high priority on population growth for both historical and future ridership - Regional councillors are aware of population forecasts and understand transit and land use density connections 	 <ul style="list-style-type: none"> - The ROP, RGMS and RTMP work together to manage population growth and promote transit supportive land use policies, such as increased density 	 <ul style="list-style-type: none"> - GRT has expanded service regularly since 2000 to accommodate growth - Rapid transit is one example of initiative intended to help curb urban sprawl and attract more passengers
+	KINGSTON - Population growth is slow but positive, and density is low, so impact on ridership is weak positive		
	 <ul style="list-style-type: none"> - Kingston transit staff are aware of low population growth, but require more tools to become stronger advocates for transit supportive land development - City councillors do not make a connection between transit and need for greater density 	 <ul style="list-style-type: none"> - OP provides some language to transit use and intensification, but is missing certain key policies - KTMP is not strong on promoting transit-supportive densities 	 <ul style="list-style-type: none"> - Kingston's bus fleet has increased between 2003 and 2009 to expand service - Transit budget has grown at greater rate than population growth, which helps attract riders

4.2 Demographics

In order to increase transit ridership, it is not just the size of the population that is important, it is also the characteristics of the population. To paraphrase Waterloo interview respondent W1, the type of population has almost more of an impact on ridership than population by itself. Certain demographic segments are more likely to ride transit than others are – specifically these include seniors, students and immigrants. Therefore, this section evaluates these user groups in terms of their impact on transit ridership.

Seniors | Literature

For many older adults, those aged 65 and older, public transit forms a vital role in maintaining their quality of life. In fact, many studies cite transportation as the primary challenge for older adults (Peck, 2010, p. 3). Lack of access to transportation can prohibit their ability to complete daily living activities, such as “visiting friends and family, grocery shopping, and obtaining and managing medications and healthcare” (Peck, 2010, p. 1). Adequately serving the senior population will become a significant challenge in the coming decades. The “graying of America” trend, which is also occurring in Canada, forecasts that by 2050 21% of the American population will be 65 years or older, compared to 12% in 2000 (Peck, 2010, p. 1).

While transit planning certainly should focus on the senior market now and in the future, it is unclear how big the impact of the “graying of America” on transit planning will be. A U.S. study suggests that only 3% of seniors take public transit for meeting their travel needs within their communities. Canada has a similar rate of high reliance on the automobile and, furthermore, the Canadian boomer generation has higher expectations for personal mobility than in preceding generations (Region of Waterloo⁵, 2010, p. 183; PriceWaterhouseCoopers, 2008, pp. 10-11). David Foot, demographer and author of *Boom, Bust and Echo*, predicts low transit usage among today’s and tomorrow’s seniors. “The aging of the [baby] boom [generation] was a disaster for many of Canada’s public transit systems,” Foot writes, since, in their working adult lives, boomers moved out of the inner city to the suburbs and used the car as their primary mode (1996, p. 182). Peck agrees with the car’s popularity among the boomer generation: “private vehicles are used for 90% of all older adult transportation needs” and, today, older adults walk,

ride public transit, and ride with others less frequently than those of previous generations (2010, pp. 1 & 4). Seniors in 2030 or 2050 will be more able-bodied than seniors today, due to improved health care, so they will not have to give up driving as quickly once they reach the end of their driving expectancy. Thus any positive impact on transit ridership resulting from an aging population may not be significant.

In contrast to the above research, Peck believes, “many researchers and policy analysts have argued that the increasing older adult population represents a largely untapped source of ridership for public transit (2010, p. 38). This could be due to the sheer proportion of older adults in the coming decades or because the gap between seniors’ driving expectancy and life expectancy is increasing from previous generations (Peck, 2010, p. 3). This information suggests an increased need for transit service among the senior demographic once seniors stop driving (or possibly an increased burden placed on family members and caregivers to provide transportation to seniors). There is also unmet demand for paratransit service, which enables seniors to call a dispatcher from the local transit agency for a ride to a destination. The gap between the supply and demand of older adult paratransit is expected to continue to widen (Peck, 2010, p. 4).

Considering the research presented above, low transit use among seniors contradicts an apparent need for more service for older adults. In order to serve this market, however, the significant barriers for seniors to use public transit should be identified. They are summed up in the five “A”s: availability, accessibility, affordability, adaptability and acceptability. Seniors are less likely to use transit if any one of the As is missing from the transit service (Peck, 2010, p. 9). Transit service should be *available* and *accessible* to seniors’ homes and other destinations. Stops should be located within a quarter mile of the destination because many seniors may not feel comfortable walking two or more blocks to a stop (Peck, 2010, p. 28). There should be a variety of bus lines to access. Off-peak service should be frequent because this is when seniors typically use the service (midday and on weekends) (Peck, 2010, p. 32) and since it may be difficult for someone to wait at a stop for long periods. In addition, the physical design of a stop should facilitate a senior’s access on and off the bus, and buses themselves should be a low floor design, which does not have stairs at entrances/exits. For the third A, reduced fares can make transit more *affordable*. The fourth trait is the ability of a transit agency to *adapt* its routes and services according to the changing needs of seniors as well as individual preferences. *Acceptability*, the

fifth A, involves a combination of the four As, which forms a senior's perception of the acceptability of using transit over both the short and long terms. Some of the suggestions to improve the five As would incur higher costs (due to increasing service frequency and coverage) and lower revenues per passenger (due to reduced fares); therefore, a transit agency would have to determine whether an increase in ridership justifies the extra expenses, or if additional funding can be made available for initiatives to attract senior citizen customers.

Another challenge to serving seniors relates to housing options. Peck (2010, p. 9) writes that much has been written about the "aging in place" phenomenon: seniors remain in the house in which they spent most of their adult years, typically a single detached house in a low density suburban neighbourhood. A seniors living centre in a higher density area, for example, might better serve their travel needs.

Despite the challenges associated with serving senior citizens, whether from a transit market or social service perspective, it will still be important for transit agencies to serve effectively this important population segment. It is a well-known fact that the senior population segment will increase in size in the next 10+ years and that seniors are living longer. Providing adequate transit service to older adults can increase ridership and revenue, lessen automobile dependency, enhance mobility and reduce social isolation (Peck, 2010, p. 41).

Seniors | Kingston

Current Conditions

Kingston's population has been aging for some time. Kingston is the seventh oldest Census Metropolitan Area (CMA) in Canada. The Kingston CMA includes the City of Kingston, South Frontenac Township, Loyalist Township and Frontenac Islands Township. Adults in the 65+ age bracket comprise 15.3% of the city's population, which compares to 14.2% in 2001 (Tripp, 2007). The growth in the senior population will accelerate as more baby boomers enter retirement.

Seniors represented 10% of transit riders according to the 2008 Transit Discussion Paper (City of Kingston⁷, 2008, p. 9), which is higher than average use found in the literature. There was a

3% increase in senior ridership from that reported in the City’s 2005 5-year Transit Business Plan (City of Kingston⁷, 2008, p. 9). Ridership then dropped drastically from 2008 to 2009. These trends can be seen in Figure 15. Overall, there has not been a large ridership attraction for the past eight years, and the level in 2009 is well below what it was in 2002. Historically, the use of transit by Kingston seniors “has remained relatively static for some time as there are more seniors driving and switching to the specialized transit services operated by Kingston ACCESS Bus” (City of Kingston², 2005, p. 5). It is unclear why ridership suddenly dropped in 2009, as no staff reports are available that have analyzed the situation. If transit ridership by senior citizens does not keep pace with the growth in the senior population, as is the case now, then this will represent an underserved market and an opportunity to increase ridership.

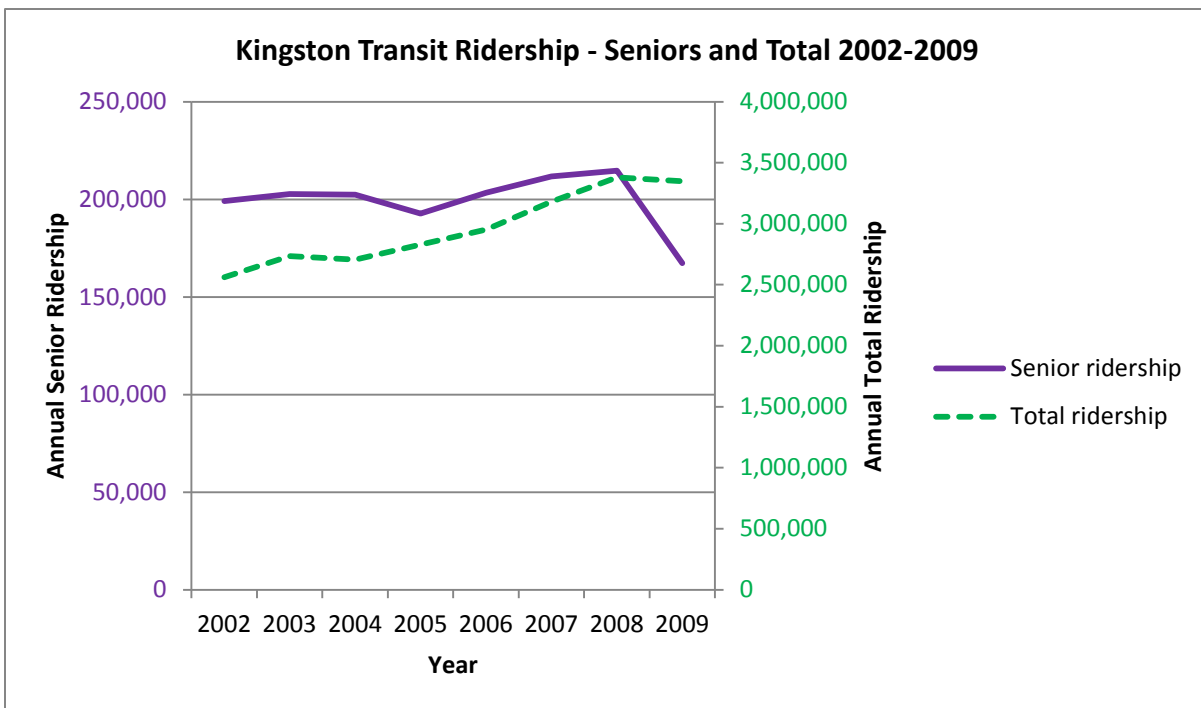


Figure 15: Kingston seniors and total transit ridership, 2002-2009. Statistical source: CUTA/MTO Ontario Urban Transit Fact Books

Kingston recognizes its aging population in the area of housing. Kingston is starting to adapt to this growing demographic by building new retirement residences and planning hundreds of more spaces. The Kingston Economic Development Corporation believes that Kingston is “very well placed to be opportunistic about [an aging baby boomer generation] in terms of [being] a regional health-care centre” (Tripp, 2007). Kingston Transit must be ready to serve these new residences in order to retrieve, and then grow, the ridership of the senior population.

Given the size and expected growth of the city's senior population, it is expected that this factor has a potentially large positive influence on ridership. That will depend, however, on the City's ability to attract the market.

Staff Awareness

All four interview participants identify the aging population as a significant factor impacting ridership in the city over the following decade. Respondent K1 is well aware of Kingston's status as a retirement destination, noting that the city offers a "slower lifestyle" and is regarded as a desirable place to live. In regard to the aging population, respondent K2 believes that ridership may increase as seniors become unable to drive. Given the comments made through the literature on the lack of transit use among seniors, respondent K4 accurately points out that "that there's an opportunity for a market [from the retirement community] if we can get it right in terms of service."

All four councillors regard the city as an older community and retirement destination. Councillors seem not to be aware of the recent drop in senior riders as they do not make any note of providing better service for seniors. However, since both councillors and staff are aware of the aging trend, staff awareness of this factor is considered appropriate.

Policies/Guidance

The KT 5-year Business Plan 2005 recognizes this demographic factor. It points out that, in order to achieve the KTMP's modal split goal of 11% by 2029, the City will need to focus its transit improvement efforts on the needs of seniors and adults (City of Kingston², 2005, p. 68).

The 5-year Business Plan and 2008 Transit Discussion Paper identify the main issues that seniors particularly experience when using transit (City of Kingston², 2005, pp. 42 & 69; City of Kingston⁷, 2008, pp. 9 & 11). The main issues are:

- Bus stops and shelters located too far from seniors' access points
- Routes located too far from seniors' residences (e.g. Fairmont Homes and Country Pines)
- Long headways (60 minutes) on some routes
- Reduced service in non-peak hours, since seniors typically use non-peak service

All four of these issues relate to the availability, accessibility and acceptability barriers defined in the literature, and the fourth barrier may also impact the adaptability of the agency to provide non-peak service as is required by seniors. The fifth barrier, affordability, does not seem to be a barrier in Kingston since KT offers discounted fares, which are under the senior fares offered by several similar-sized transit systems in Ontario (City of Kingston⁷, 2008, p. 13). Peck pointed out that the absence of any one “A” can significantly reduce the propensity of seniors to use transit. These issues were identified in 2008, but no guidance documents have been produced that are available to address either these issues or the 2009 loss in ridership.

There has been some guidance provided on this market segment, which is appropriate in identifying service needs. However, follow-up studies would be helpful to analyze the loss of senior riders in 2009.

Implementation of Initiatives

Kingston is doing some things well in targeting this growing market. The agency began to replace its fleet with low floor buses in 2003 and the fleet is now almost fully accessible. Low floor buses provide easier boarding for people using wheelchairs or walkers or who have trouble climbing stairs. Discounted bus tickets and passes are provided to seniors – a single trip fare is reduced by \$0.50 to \$2.00 and a monthly pass is reduced by \$21 to \$44 compared to the regular adult fare. KT also runs a program called the Support Person Pass. It is a free bus pass issued to eligible people who need to be accompanied by a caretaker. Eligibility includes physical, mental or learning disabilities or mental disorders. A dial-a-ride service is operated in the rural north part of the city, where at least one retirement centre is located.

For the most part, these initiatives indirectly benefit the senior market, with the exception of the reduced fares for seniors. The other programs are designed for passengers with physical or mental impairments; these passengers may or may not also be senior citizens. The fact that some of these initiatives have not addressed the service gaps that were identified in Kingston’s 2008 Transit Discussion Paper demonstrates an inappropriate response to implementing required initiatives. The continued issues may have contributed to the lack of ridership growth and the

large drop in senior riders in 2009. Not addressing these issues will impact senior ridership going forward.

Conclusion

The senior population is an important transit demographic since Kingston is one of the oldest CMAs in Canada, and Kingston's population will continue to get older in the future. Kingston is also considered a retirement destination. It is expected that services designed for the seniors market will become very important, and that the growth in the seniors market will contribute a large growth in ridership if these services are provided.

City staff and councillors recognize that the growing senior demographic will be an important factor in the transit market in the future. This is an important recognition, but it is also important for councillors to be aware of the lack of ridership growth in this market. Staff awareness of the factor is appropriate but could be improved.

With the exception of a staff report to provide an update on recent losses in senior ridership, the KTMP and transit guidance documents provide information on the need to prioritize Kingston's senior ridership.

Municipal initiatives to encourage older adult ridership contributed to a 3% increase between 2005 and 2008, but there was a 22% loss between 2008 and 2009. There are important service gaps that negatively impact the availability, accessibility, adaptability and acceptability of the service for the senior market. These service issues should be addressed before more seniors abandon transit.

Seniors | Waterloo

Current Conditions

Like Kingston's, Waterloo's population is aging. Compared to Kingston being the seventh oldest CMA in Canada, the Kitchener CMA (comprising Kitchener, Waterloo, Cambridge, North Dumfries Township and Woolwich Township) is the fourth youngest, according to Statistics Canada. However, by 2028 the proportion of 55+-aged adults in the region is projected to grow

by 89%, or from 22% to 31% of the population. This is a similar growth in the rest of the province, where the projected growth is expected to increase from 25% to 33% in the same period (Region of Waterloo⁵, 2010, p. 8).

Older adults in the region are primarily car users rather than transit users. A Region of Waterloo 2010 Older Adults Health Status Report provides travel mode data for older adults. The report (Region of Waterloo⁵, 2010, p. 180) states that, in 2006, 91% of adults aged 55-64 drove or rode as a passenger in an automobile for trips to and from work. Out of the remaining 9%, only 2.7% used public transit. For the higher age group, adults aged 65+, the rate of transit use decreased to 2.1%. The high rate of car use among seniors in Waterloo Region is the same as the findings in Peck (2010), which show that 90% of seniors use the automobile as their main mode.

Author David Foot, on a visit to the region to discuss the rapid transit proposal, provided context to the low rate of transit use by seniors. He cautioned expectations that an aging population would lead to increased ridership or that light rail transit would attract older adults. “They’re going to drive their cars until they can no longer drive them,” he said, also predicting that few suburban residents will relocate to downtown condos as they get older (Outhit¹, 2010).

While the rate of transit use is low in the region, the growth rate of this demographic using transit has matched the growth rate for total ridership (Figure 16). This means that seniors have continued to be attracted to the service between 2002 and 2009.

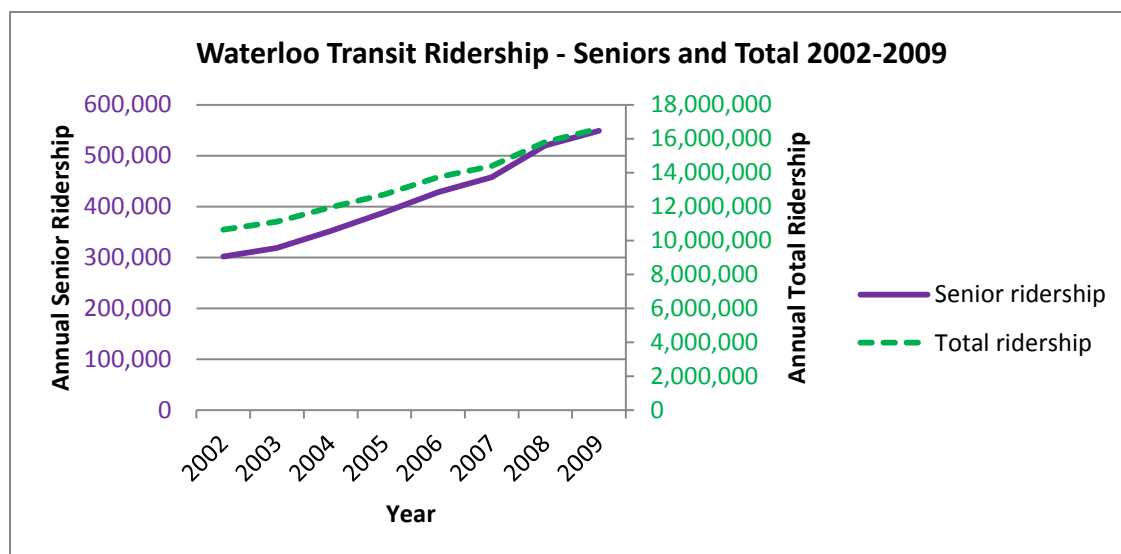


Figure 16: Waterloo seniors and total transit ridership, 2002-2009. Statistical source: CUTA/MTO Ontario Urban Transit Fact Books

In addition to the positive growth rate in ridership, a reason why seniors may become of greater importance for transit servicing in Waterloo is the data that suggests seniors are moving away from suburbs, traditionally where the car is the dominant form of transportation, and into more urban areas in the region, where transit service is better. The Aging in Place phenomenon, where people live in the same house for as long as possible, was dominant during the 1980s and 1990s. Aging in Place “became the basis for establishing a whole range of services for seniors in the suburbs” (Pender, 2010). Now, however, the demand for smaller dwellings and more compact unit types will continue as the population ages (Region of Waterloo⁹, 2009, p. 50). The marketing campaigns for condo projects are targeted at empty nesters (Pender, 2010). The marketing for transit should increasingly target this demographic.

Due to the positive historic growth in senior ridership and the expected growth in the senior age cohort, transit ridership is expected to benefit from this factor. However, the expectation is tempered by seniors’ high driving rates and the increasingly better physical health and affluence of seniors, as explained below. It is uncertain whether this factor will lead to big or small ridership growth, but the conclusion is that at least small ridership gains will be realized.

Staff Awareness

Two interview respondents believe that the aging population will be significant in Waterloo while two believe this trend will not be significant. The respondents who predict significance, however, caution that this demographic may not have a huge impact. Respondent W1 says that the future population of seniors will be in better health for longer and hence will drive longer, so they will not use transit as much. Respondent W2 says, “we’ll get more seniors but the baby boomers are the most affluent seniors we’ll ever see... They’ve grown up in an age of the private automobile and they’ve got this whole idea of individual freedom that’s built into the culture, so I think that getting them out of their car will be very very difficult.”

Among the councillor respondents, WC1 recognizes that Waterloo is aging. WC2 identifies the senior population group as “sometimes homebound.” There is no mention by any councillor of targeting this group as a key opportunity for ridership growth in the future. This low level of attention on the senior market is appropriate for two reasons. First, ridership among seniors has

kept pace with that of total ridership, making it a low priority to try to attract more of these residents. Second, transit staff are uncertain whether, in fact, the growth of the seniors demographic has a potential to accelerate ridership; hence councillors can focus their attention on more influential factors. Councillors should remain apprised of ridership trends and needs of seniors, but currently it is not a concern if they are not very engaged. This level of awareness among staff and councillors is appropriate.

Policies/Guidance

The 2010 RTMP makes two comments about the aging population. It says, as already mentioned, that the demand for smaller dwelling units will rise. It also says that the share of discretionary travel will increase as a percentage of total travel, which means that transit demand for the traditionally non-peak time of day – midday – will increase significantly (Region of Waterloo⁶, 2010, p. 3-35). The RTMP does not provide further conclusions or specific recommendations for the senior market, despite acknowledging that this population sector will grow.

While the proportion of seniors using transit in the region is low and it is unsure how high senior ridership will get in the future, the Region’s public health department recognizes the continued importance of improving transit service for this population group. The Region reports that “many older adults spend a large proportion of their time” locally to access services and engage in social or recreational activities” (Region of Waterloo⁵, 2010, p. 186). GRT serves the communities in which seniors spend most of their time; therefore, the senior population represents a key market.

It may be difficult for municipal staff to assess how effectively this market is served and how it will be accommodated in the future. However, the lack of specific policy guidance is appropriate for the time being since it is unclear how important the senior market will be in the future.

Implementation of Initiatives

GRT provides most of its services relating to seniors in a program called MobilityPlus. This is a special service for physically disabled residents of the cities of Waterloo, Kitchener and Cambridge; for residents of one of the four townships within the region, people aged 65+ or

who have mental disabilities are also eligible. MobilityPlus registered participants can utilize a paratransit service by booking trips by phone between two and 28 days in advance. They can also subscribe to permanent bookings if a customer has repeated trips at the same time every month, for example. There is a taxi service that allows a MobilityPlus participant to buy pre-paid coupons for use with any taxi service in Waterloo, Kitchener and Cambridge. These paratransit services are cited in the literature as some of the more “fruitful techniques” for dealing with user needs of older adults (TCRP 82, 2002, p. 129).

For the region’s conventional transit, MobilityPlus registered riders can ride free. There is no discounted cash fare for seniors; they pay the regular adult fare of \$2.50. Apart from MobilityPlus, GRT provides discounted monthly passes for seniors – they pay \$50 versus \$60 for adults.

GRT partners with two agencies to provide reduced monthly passes to low income residents. The passes cost \$34 to eligible participants, and the remaining cost is back-filled by the Region’s Social Services department. This fare structure is consistent with best practice: agencies will often provide reduced fare monthly passes or partner with a social service organization or volunteer society to provide the pass (Peck, 2010, p. 39). Interview respondent W2 indicates that this delivery method works well as it is a partnership between GRT, the Region’s Social Services department, social service agencies and advocacy groups in the community.

In addition to fare discounts, much of the bus fleet is low floor accessible, benefiting seniors who have trouble climbing stairs. The low floor fleet and MobilityPlus services help GRT to fill the demand and supply transit gap for seniors identified in the literature section above. They have contributed to a senior ridership growth that has kept pace with total ridership.

These initiatives have been appropriate in encouraging senior ridership over the past decade. The continuation of these programs is appropriate for the relative influence seniors are expected to have on the region’s ridership.







Conclusion

While the seniors demographic is expected to increase, their improving health and affluence may lead to more driving behaviour rather than less. Most seniors in Waterloo Region drive. At the same time, more seniors are expected to move into downtown condos. It will be important to continue to serve the seniors market, but it is unclear how much the senior cohort will influence ridership of the GRT system. Therefore, this factor is determined to have a small positive impact on ridership in the future, which may or may not become a large positive impact.

Staff and councillors are aware of the aging trend, but staff are unsure exactly what impact this may have on ridership depending in part on whether the baby boomer demographic has a propensity to ride transit. This is an important knowledge gap considering the aging trend in the region. Staff should conduct analysis on the possible future impact of this market in order to help plan services.

The Region's RTMP and public health department have some guidance documents on this market. This is appropriate while senior ridership continues to grow alongside total ridership growth.

Waterloo is providing transit services that specifically benefit seniors. Programs such as MobilityPlus and low floor buses have helped create a continued growth in ridership.

DEMOGRAPHICS – SENIORS			
Municipality's Level of Response →	Staff Awareness	Policies/Guidance	Implementation
Impact of Factor on Transit Ridership ↓			
+	KINGSTON - Kingston is expected to get older, demographically, in the future, so seniors represent an important market segment		
	 <ul style="list-style-type: none"> - Kingston staff recognize this important market segment - Councillors recognize Kingston as a retirement destination; however, their awareness of recent ridership losses can be improved 	 <ul style="list-style-type: none"> - The KTMP and Transit 5-year Business Plan mention the need to improve service for seniors in order to reach target modal split - A staff report should be produced to analyze the loss of senior riders in 2009 	 <ul style="list-style-type: none"> - Important service gaps in transit for seniors remain and have led to a large drop in ridership
+	WATERLOO - Waterloo's senior population is expected to grow but it is unsure whether this will lead to large or small transit ridership growth		
	 <ul style="list-style-type: none"> - It has not been made clear by staff what impact the senior cohort will have on ridership 	 <ul style="list-style-type: none"> - Some guidance is provided on this market, which is appropriate since senior ridership is currently healthy 	 <ul style="list-style-type: none"> - Implementation of projects has led to strong ridership growth among seniors

Students | Literature

Students represent a strong target market for transit operations. Canada's youth (aged 16-24) account for one third of the country's transit ridership; in small and mid-sized cities, they can make up as much as 65% of ridership (CUTA¹, 2004, p. 1). The Ontario Centre for Municipal Best Practices indicates, "post-secondary institutions, both universities and colleges, represent a significant transit market in most communities" (2004, p. 3).

There are continuing challenges with attracting and serving student riders, however. Growing enrolments exert more pressures on existing transit services and campus roads, and a larger number of students now drive to work, which adds to local congestion and creates more demand for parking (CUTA¹, 2004, p. 1). Other challenges for transit agencies in serving the student demographic are: rising costs for fuel and other services, demographic changes, construction of housing within walking distance of campus, school funding cuts, provision of accessible services, and the seasonality of service (summer's lower volume) and related workforce issues (TCRP 78, 2008, pp. 1 & 12).

Despite these challenges, many university communities experience ridership increases. TCRP Synthesis 78, titled Transit Systems in College and University Communities, provides information on practices and trends of planning and operating municipal transit systems within college and university communities. The report builds upon a 2001 TCRP report, synthesizing information from schools, local transit systems and government agencies. In a survey of 62 American universities/colleges or transit agencies that provide specialized student transit service, 55 respondents reported an increase in ridership. The increases were typically between 1-5%. The commonly cited causes for this were (TCRP 78, 2008, p. 12):

- Increasing gas prices
- New routes or increased service levels
- Universal university pass (U-pass) agreements or other price incentives
- Growing student enrolment and other demographic shifts
- Decreases in parking availability on campus
- Increased awareness of routes
- Marketing

U-passes accounted for the single most widely used strategy among the case study agencies in TCRP Report 111 (TCRP 111, 2007, p. 51). TCRP Reports 111 and 39 find that U-pass programs have proven successful in university communities throughout the U.S. and are appropriate collaborations for all transit modes (bus, rail) and service environments (downtown core, urban, suburban and rural). U-passes are prepaid transit fares, typically paid through university tuition fees, that grant students unlimited access to the municipal transit system. Often, the student card serves as the proof of payment. U-pass programs have been in place on American campuses as early as the 1960s, and the first Canadian campus to launch the U-pass is Queen’s University in Kingston in 1973 (TCRP 39, 2001, p. 29; University of Lethbridge, 2009). Over 60 Canadian universities have implemented a U-pass program (University of Lethbridge, 2009). Figure 17 shows the growth in U-pass programs at Canadian post-secondary schools between 1994 and 2003.

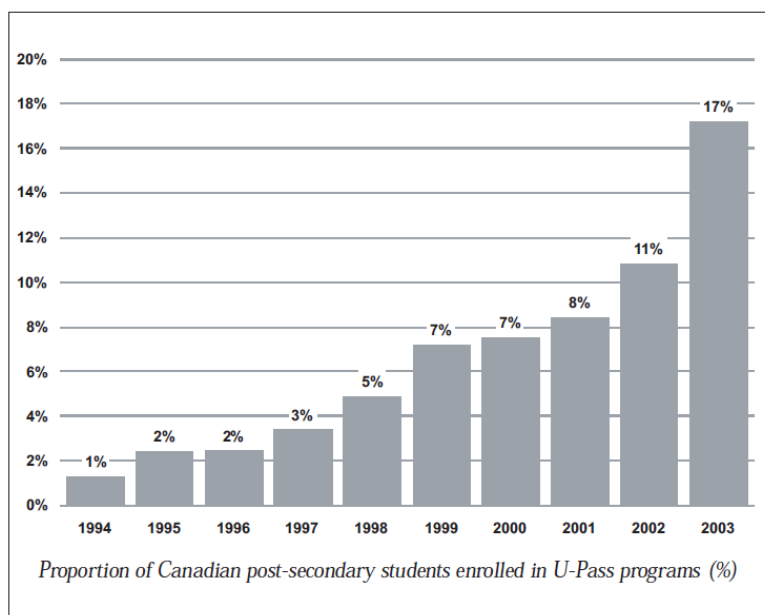


Figure 17: Proportion of Canadian post-secondary students enrolled in U-pass programs, 1994-2003. Source: CUTA¹, 2004, p. 2

Post-graduate attendees are not the only students to make use of transit. High school students represent a large market for transit. They are less likely than university students to have access to a car for personal use. Transit agencies often have relationships with school boards to provide school specials or discounted passes. Mid-afternoon is when students let out of school, so

providing non-peak service utilizes spare transit agency capacity without a proportional increase in operating costs (CUTA¹, 2004, p. 3). School boards also reap the benefit of providing cost-effective student transportation with a local partner (CUTA¹, 2004, p. 3).

Students | Kingston

Current Conditions

Kingston is a university and college town, so students are a significant demographic in the city. There are several post-secondary schools and a number of high schools. Queen's University is one of Canada's oldest universities and had approximately 17,800 full-time students in 2009. There is also St. Lawrence College (SLC) with 6,000 students and Royal Military College (RMC) with 1,500 students.

In the 2006 census, the proportion of residents (15-24 years old) in the city was 14.7% (6.6% aged 15-19, which approximates high school students, and the remaining 8.1% aged 20-24, which approximates university and college students). The 2001 census recorded a similar proportion of 15-24 aged residents – 14.9%.

According to KT's webpage "Kingston Transit – Profiled," Queen's and SLC students contribute 37.5% of KT's ridership. Students aged 6-18 comprise 9% of the ridership. Figure 18 and Figure 19 below show interesting – and concerning – statistics regarding student ridership on Kingston Transit. Total ridership in the city increased from about 2.6 million trips in 2002 to 3.3 million trips in 2009. However, student ridership decreased substantially within the same period. Between 2002 and 2005, ridership dropped steadily to 266,000 students until 2006, which saw a slight increase, and 2007, in which there was a large increase to 357,000. Then a sharp decrease to 174,000 occurred by 2009 – a 45% drop. University enrolment increased by 8% at Queen's University between 2005 and 2009, while total student transit ridership dropped 35% between 2005 and 2009. This begs the question of why, during times of increased total ridership and student enrolment, there was such a significant loss of student passengers.

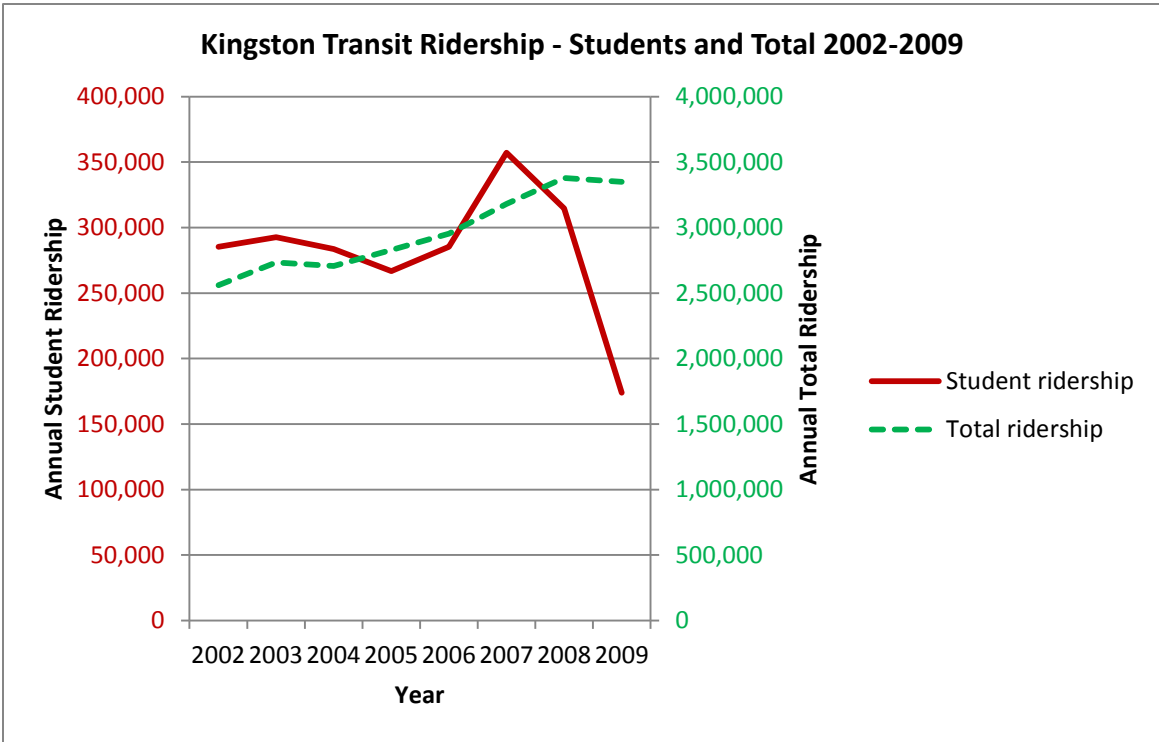


Figure 18: Student and total ridership on Kingston Transit 2002-2009. Statistical source: CUTA/MTO Ontario Urban Transit Fact Books

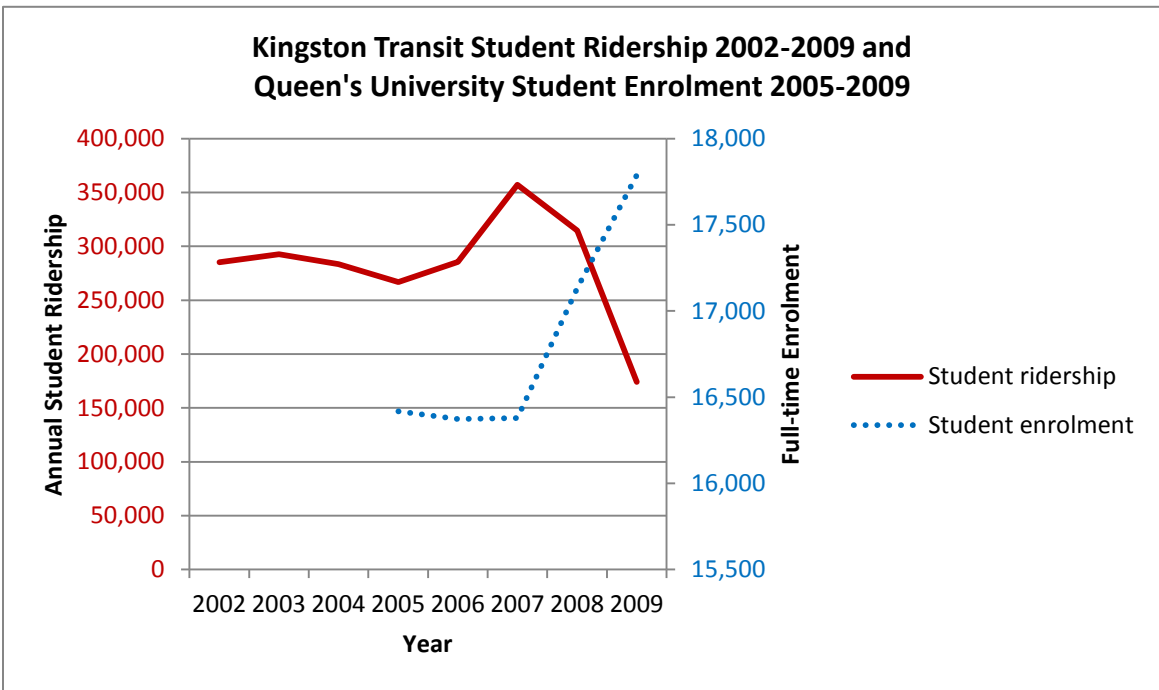


Figure 19: Kingston Transit student ridership compared to Queen's University enrolment. Statistical sources: CUTA/MTO Ontario Urban Transit Fact Books and Council of Ontario Universities' Common University Data Ontario

Before looking at the possible reasons for the ridership drop, the increases in 2006 and 2007 will be examined. This increase can be attributed to service improvements effected by Kingston Transit. In consultation with student organizations and other members of the public, the agency added new routes. In 2006, KT launched My Ride, a marketing program that increased residents' awareness of increased frequency and more service hours, including on the weekends (Armstrong, 2008). The agency also installed bike racks on buses, a program called Rack 'n Roll. These improvements are thought to have increased the number of youth and adult riders (Kingston Whig-Standard, 2008).

Then student ridership fell. As mentioned, student enrolment in post-secondary education is not the cause; also, total transit ridership rose in this period. Anecdotally, some students say that they live so close to campus that they have no use for the bus. While student residences are located near campus, this cannot explain the large drop in ridership. In addition, student representatives have expressed key service issues. These reasons for the ridership loss are examined in the Policies/Guidance and Implementation of Initiative sections.

Another concern is that Kingston university students tend to leave the city upon graduation. It was mentioned in the literature that students who use a U-pass during their post-secondary career might have a higher tendency to use transit as working adults. However, in Kingston, it is estimated that, out of the 96% of students who come to study at Queen's from outside the city, 92% leave upon graduation. The post-graduation exodus is due to "strong dissatisfaction with Kingston's employment prospects" (City of Kingston⁸, 2011, p. 6). Hence, Kingston Transit's efforts to attract post-secondary students should focus on meeting their needs while they are students. Using resources to promote the city's transit as a long-term lifestyle choice could be wasteful.

Like that for post-secondary students, ridership among high school students is important for KT. Students aged 6-18 comprise 9% of ridership. However, due to demographic trends, this segment may contribute a loss of ridership in the future rather than a growth. It is expected the proportion of high school students will decrease in the future. This is because the 2009 Kingston Community Profile indicates that two of the family types increasing the fastest are common-law

couples without children and married couples without children (City of Kingston⁵, 2009, exec. summary, p. 2). With fewer children residing in the city, there will be lower high school admittance. A deflated market base of these typically captive riders could have a direct negative effect on transit ridership.

The student factor is expected to have a large negative influence on Kingston's transit ridership for three reasons. First, student ridership has been falling over a number of years, with a very dramatic drop in 2008. Secondly, students tend to leave the city after graduating from college or university. Thirdly, families with children are becoming a less common type of household in the city.

Staff Awareness

Interview respondents point to the importance of the student population to KT's ridership. While respondent K3 suggests that the city's population increase will not be significant to ridership in the next decade, the caveat is that "the population increases that have recently occurred at the post-secondary educational institutions are likely more relevant than the general population increases for transit." The example that the respondent provides is the spreading out of Queen's University residences to the West Campus due to space constraints on Main Campus. Kingston Transit is then required to move these students back and forth between Main Campus and West Campus. The interview results help demonstrate some level of understanding among transit staff regarding the student market. Nevertheless, based on the negative growth and absence of some key service improvements in the past few years, there appears to be a lack of awareness of student needs.

Three out of four councillors are aware of the population growth at Queen's, SLC and RMC. They believe this has had a positive effect on transit ridership over the last 10 years. Gleaned from these responses is a lack of awareness of the negative student ridership numbers in 2008 and 2009. It is also notable that, when asked their opinions of students' top concerns and desired elements in the transportation system, three out of four councillors venture no opinion, with one saying they hear no complaints. The fourth councillor, KC1, accurately specifies some common student concerns: greater frequency, more direct routes and busses passing waiting

passengers. Councillors' awareness of student ridership issues and the concerning downward trend should be improved.

Policies/Guidance

The 2004 KTMP mentions only three brief strategies to serve the student population. The first instance is to tailor services such as flexible routing, demand responsive service or smaller vehicles “to the needs of key market segments including workers, students, seniors and tourists to significantly increase the attractiveness of transit” (City of Kingston¹, 2004, p. 48). The second states, “advertisement campaigns and promotions [should] target specific groups in an effort to increase ridership (i.e., high school students, seniors)” (City of Kingston¹, 2004, p. 50). These two strategies do not provide sufficient detail to guide transit staff in actually implementing them. The third strategy identifies the Queen’s University/Kingston General Hospital precinct as a corridor where expanded service should be introduced (City of Kingston¹, 2004, p. 41). Again, details are deficient regarding this recommendation.

St. Lawrence College, which also has a U-pass and is an important transit rider generator, was not mentioned in the KTMP except for an indication that the college area provides a concentrated area of pedestrian and cycling demand (City of Kingston¹, 2004, p. 12). While student ridership increased in 2006 and 2007, the failure of the KTMP to outline specific and targeted strategies to increase student ridership in the long term helps explain the loss of momentum after 2007.

Also, perhaps due to the KTMP’s lack of insight into students’ transit issues and service requirements, a number of issues remained for students even after the 2007 service improvements. Kingston’s 2008 Transit Discussion Paper recognizes low and decreasing ridership among this demographic. The paper identifies the main concerns obtained through discussions with Queen’s and SLC student representatives (2008, pp. 9 & 11):

1. Bus routes do not adequately serve key destinations (campuses, intercity bus/train stations, Cataraqui Town Centre and the cinema at RIOCAN Centre)
2. Long waiting times if transfers are missed
3. No service after 10 pm, which is needed after watching a movie at the cinema
4. Indirect routes, such as 2 and 6, leading to long travel times

Another piece that helps explain the loss of student passengers is a staff report, titled 'Transit Service Review Status Report, which was produced after the student issues outlined above were identified. The report outlines 2009 transit priority projects. Out of the eight priority projects, none specifically addresses the ridership issues among the student population. Two or three of the projects may indirectly benefit students since they relate to improving usability (the online trip planner) and system-wide operational improvements (the route redesign project and transit signal priority along the main corridor). The other five projects do not address the student concerns mentioned above: upgrades to a park and ride, relocation of a terminal to the west end, storage facilities for the fleet, monthly passes for low income residents, and administrative/organizational issues within Kingston Transit. If some of these projects addressed student priorities, this would help ridership.

The city policies on the student segment are inappropriate to address student needs or the ridership losses.

Implementation of Initiatives

Queen's and SLC both have U-passes; Queen's has had it since 1973. Evidently, the convenience of a U-pass is not enough to attract or even retain riders. Other strategies are required to address the issues named above.

To address the first issue, a new route (yellow line in Figure 20) commenced in fall 2010 that answers student requests for a convenient connection to the VIA Rail and Coach Canada stations in the north part of the city. Route 18 provides direct connection between Queen's, SLC, VIA Rail, Coach Canada and downtown.

Headways on the route are roughly one hour and a trip from Queen's main campus to VIA

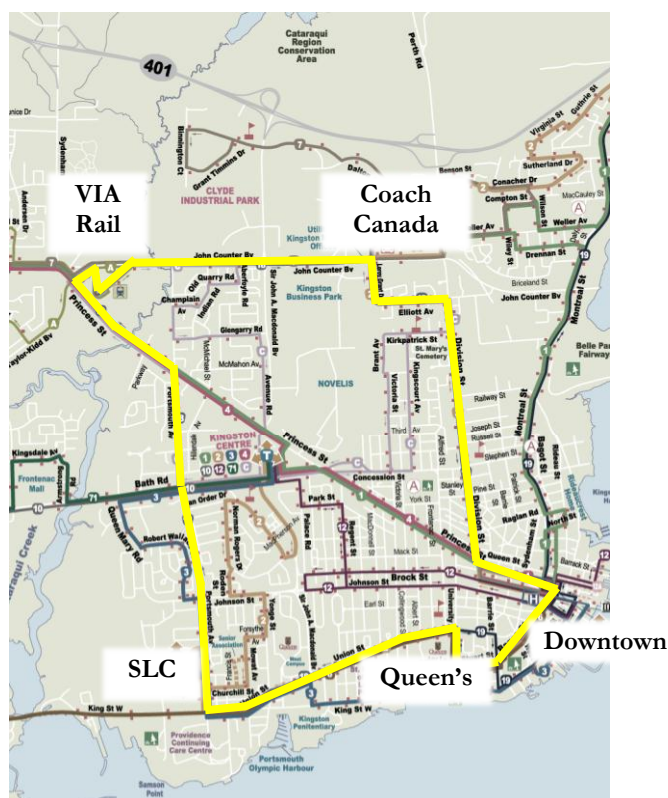


Figure 20: New Kingston bus route connecting students, downtown, VIA Rail and Coach Canada. Source: <http://www.cityofkingston.ca/residents/transportation/transit/schedules/index.asp>

Rail takes 20 minutes. This route has been successful so far. However, trips to other popular student destinations – RIOCAN Centre and Cataraqui Centre –require a transfer and take 30-40 minutes according to Kingston’s transit trip planner, whereas driving or taking a taxi takes 11-13 minutes according to Google Maps.

Long waiting times due to missed transfers (issue two identified above) was noted in 2009 by bus operators as a key operational issue, and it still exists. Drivers indicate that transfer time windows are too narrow to make connections, which causes riders to miss transfers (personal communication with bus operators, December 7, 2009).

Regarding issue three, if a student watched a late night movie at the Cineplex Odeon at RIOCAN Centre, it would require 61 minutes of travel time and two transfers to return to their residence near Queen’s University. This issue remains.

The fourth issue is not resolved as routes 2 and 6 are the same as they were in 2008 when the issue was discussed.

Returning to the literature on student transit usage, seven factors were found to positively influence ridership. Four of these, however, have not had this effect in Kingston. Increasing gas prices in 2008, new routes introduced in 2007, the U-passes and the growing student enrolment at Queen’s should have helped ridership. The opposite has happened. Based on the drop in student ridership since 2007, it appears that the student market has not been as high a priority as it should be. The priority for student servicing should be higher – this is a potential “easy win” for KT as students are traditionally a captive market and because U-passes are paid for by all post-secondary students. Kingston Transit maintains consultations with post-secondary schools, which may result in addressing the service issues noted. However, current initiatives have been inappropriate to grow, or even retain, student riders.

Conclusion

Contrary to the literature, which says students represent a significant ridership base for a transit agency, in Kingston the opposite has been true for the past several years. Between 2003 and 2005, student ridership decreased slightly, then increased and peaked in 2007 before dropping

45% to the 2009 level. The 2009 ridership was in fact lower than the 2002 ridership. In addition, the market base of high school students is expected to contract due to the rising prevalence of households without children in Kingston. Therefore, based on the current outlook, student ridership is expected to contribute a large negative growth to ridership in the future.

Staff recognize the importance of student riders and demonstrate a level of understanding toward student needs. In contrast, councillors believe that rising post-secondary admissions have had a positive effect on ridership in this market when in fact it has not. The level of awareness is not appropriate given the current ridership situation. Councillors should be made aware of the recent loss of student riders and place this as a high priority when reviewing transit project proposals.

Some recent initiatives, like the new train/intercity bus connection, should help to reverse the loss of student ridership. Also, the online trip planner launched in 2009 will make transit more user-friendly. It is likely that more programs aimed to address key student concerns will be needed in order to make significant gains with the post-secondary student populace.

Students | Waterloo

Current Conditions

The Region of Waterloo has a significant presence of post-secondary students, as well as high school students. The Region is home to several university and college campuses. Within the City of Waterloo are the main campuses of the University of Waterloo (UW) and Wilfrid Laurier University (WLU), and the Waterloo campus of Conestoga College. In the City of Kitchener are the main Conestoga College campus and two satellite campuses for UW and WLU. In 2009, UW and WLU had a combined 39,600 full-time students enrolled. In the 2006 census, the proportion of 15-24 year olds in the region was 14.5% (7% being 15-19 year olds and 7.5% being 20-24 year olds). In 2001 this percentage was 14.1%.

In the 1990s, regional ridership decreased despite population growth (Figure 21). Specifically, student ridership had been declining throughout the decade due to funding constraints and

service cuts (Region of Waterloo¹⁰, 2001, p. 30). However, this trend was completely reversed in the 2000s.

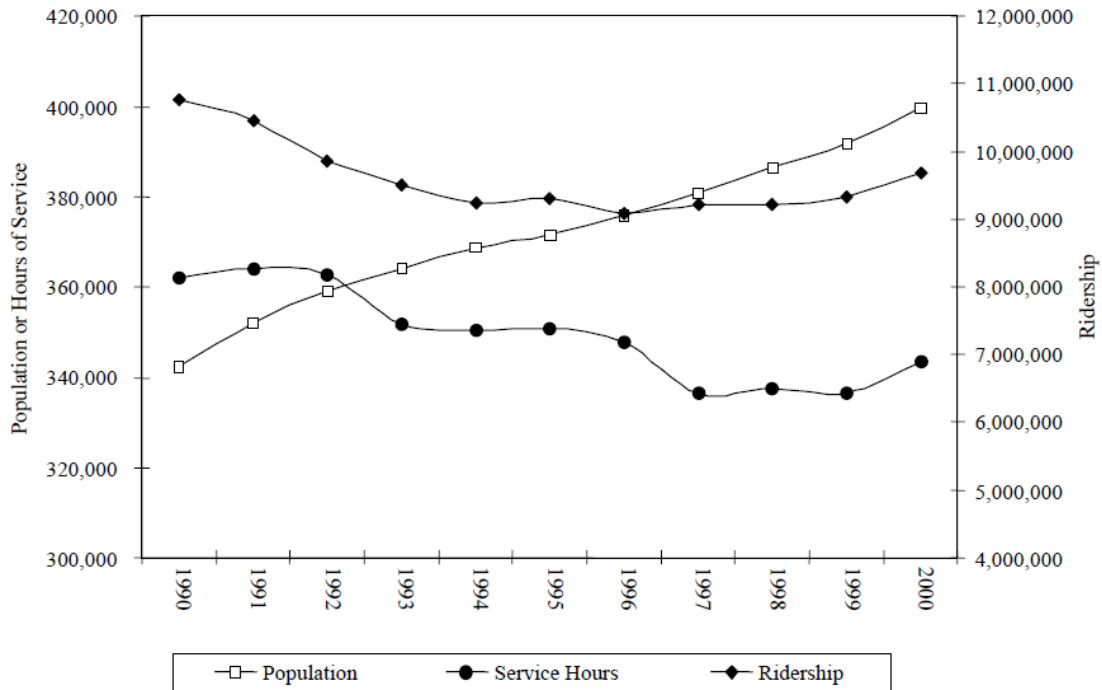


Figure 21: GRT ridership, population growth and transit service hours 1990-2000. Source: Region of Waterloo¹⁰, 2001, p. 29

Figure 22 displays the effect that student usage has on the GRT system in the 2000s. There is a strong positive relationship between total and student ridership. From 2002 to 2009, total ridership increased by 56% and student ridership increased by 82%. Figure 23 shows another positive relationship – between student ridership and student enrolment at UW and WLU. Enrolment increased 16% between 2005 and 2009. Ridership growth is consistently strong.

It is expected that the student market will continue to provide large positive increases in GRT’s ridership over the next decade.

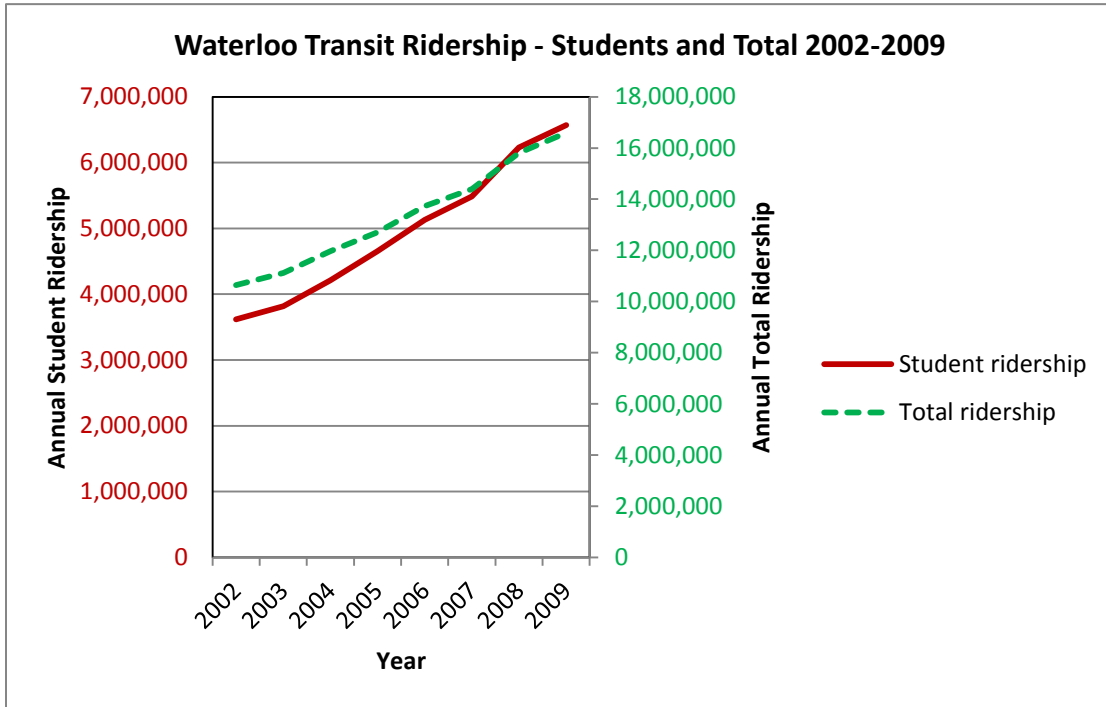


Figure 22: Student and total ridership on Grand River Transit 2002-2009. Statistical source: CUTA/MTO Ontario Urban Transit Fact Books

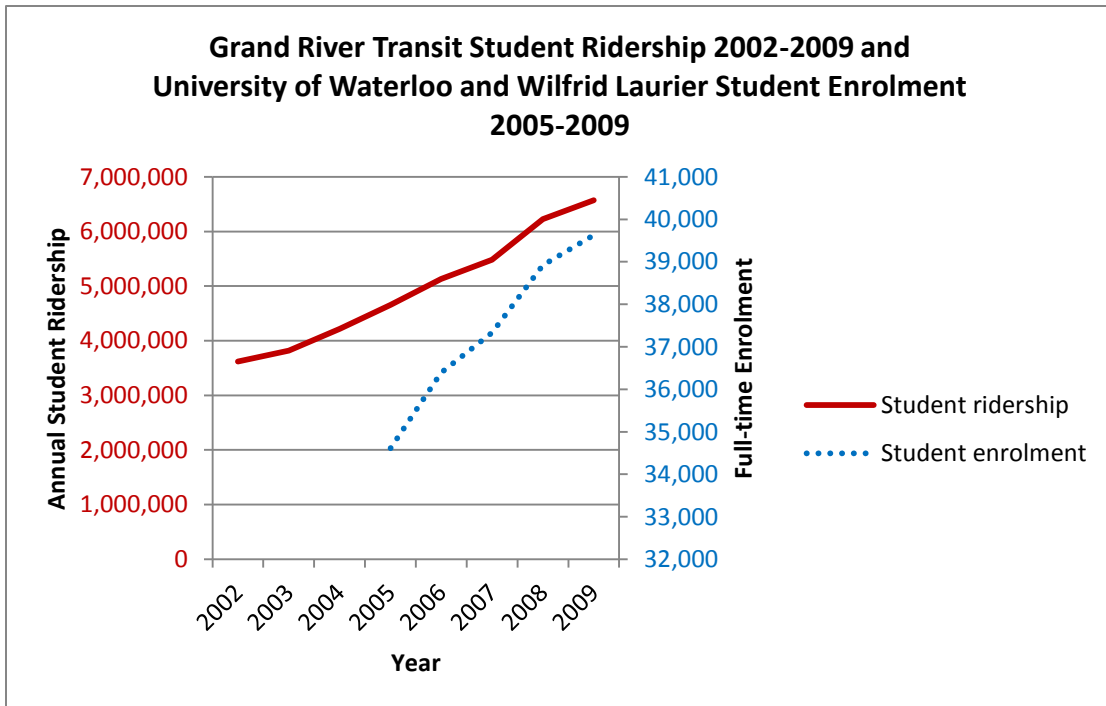


Figure 23: Grand River Transit student ridership compared to University of Waterloo and Wilfrid Laurier University enrolment 2002-2009. Statistical sources: CUTA/MTO Ontario Urban Transit Fact Books and Council of Ontario Universities' Common University Data Ontario

Staff Awareness

Interview respondents have a clear understanding of student transit needs and of the growth in student ridership. W4 says that the introduction of the U-passes (explained in the Implementation of Initiatives section) has “driven a lot of our growth,” even during years when the agency did not expand service. W4 says that U-passes were implemented because students wanted them and because the Region wanted to increase ridership. W1 says the U-pass may even deter students from bringing their car to the region upon starting the school year. However, W4 expects ridership growth to slow since each university cohort has now had the U-pass for all four years of school. Staff thus demonstrate an awareness of past and future trends related to student ridership.

Regional councillors do not mention the influence of students on ridership. Only one mentions the subsidization of student passes as a change that has had a very positive impact on overall transit ridership, and this response did not specifically mention university bus passes, which have been a boon for GRT. While councillors need to realize the important role students have played in the region’s ridership, they do identify some key concerns for this group. Key concerns include overcrowding, long travel times, the need for more express routes and continuation of subsidized passes. The survey responses show that there is some awareness among councillors and some knowledge gaps. The current awareness among staff and councillors is appropriate.

Policies/Guidance

After Kitchener Transit and Cambridge Transit merged into GRT in 2000, a 5-year business plan was generated and annual service expansions were made. The business plan recognized that a significant growth in the student market was occurring. Thusly, the business plan emphasized providing services for this market in order to attract more riders and achieve transit modal share targets (Region of Waterloo¹⁰, 2001, p. 3). What differentiates GRT’s 2001 business plan from KT’s 2004 KTMP is the specificity of strategies to attract students. For example, the GRT plan noted that a largely underserved student area was along Columbia Street, on which its houses were rapidly turning over into student residences. Express service along the main (King Street) corridor and five other possible corridors to bolster service were identified. The implementation of these strategies has proven very successful throughout the 2000s.

Looking to the outlook of student ridership in Waterloo Region, the RTMP identifies service improvement priorities for the 0-5, 5-10, 10-20 and 20+ year periods. One of the improvements in all periods is to provide extra service to meet increased student demand (Region of Waterloo⁶, 2010, p. 27). It is interesting that GRT continues to plan service expansions specifically for students even though they expect ridership growth to slow.

The RTMP mentions strategies pertaining to high schools, including maintaining collaborations with school boards to develop efficient servicing and limiting student parking at high schools. Details on any other ridership-promotion strategies for this market are not provided. Considering that student passes and tickets (not including U-passes and college passes) make up a fairly low percentage of iXpress ridership as shown in Figure 24 – and that this low rate may be expressed across GRT’s other routes – a more specific outlay of high school market initiatives may be warranted.

The policies pertaining to students appropriately indicate that this market is a high priority and include specifics in the strategies to encourage ridership growth.

Implementation of Initiatives

Compared to Queen’s University in Kingston, which has had its U-pass in place for undergraduates and graduates since 1973, UW and WLU began U-pass programs with GRT much later. The programs began in 2005 for WLU undergraduates and 2010 for WLU graduates, and in 2007 for UW undergraduates and 2010 for UW graduates. The U-pass fee per four-month term is \$53 for UW students, which compares to \$197 for a four-month college pass for Conestoga College students, or \$240 for four months’ worth of a GRT adult monthly pass. The U-pass partnerships with GRT have been “overwhelmingly successful,” according to interview respondent W4, who explains it is due to a combination of their deeply reduced cost and the much higher service provided in the university area.

The iXpress service that began in 2005 was also hugely successful with UW students (Figure 24). This was budgeted for a total of \$4.6 million in the 2005 and 2006 transit capital forecast budgets. The iXpress route stops at both UW and WLU and provides fast and frequent service to popular student destinations, such as Conestoga Mall, Fairview Mall, uptown Waterloo,

downtown Kitchener and the intercity bus station in Kitchener. GRT staff involved students in the development of the iXpress service to ensure the project would meet their needs. Interview respondent W1 believes there is a good working relationship between GRT and the student associations, saying, “we think we did a good job working with the university... on the [implementation of the iXpress] project.” The figure shows lower usage rate by college passes. This may be because the iXpress route does not directly serve the college’s two campuses, so transfers would be required from regular bus routes to access iXpress. Therefore, the iXpress project has been very successful with students, but perhaps the college market represents unrealized ridership potential along one of GRT’s more popular routes.

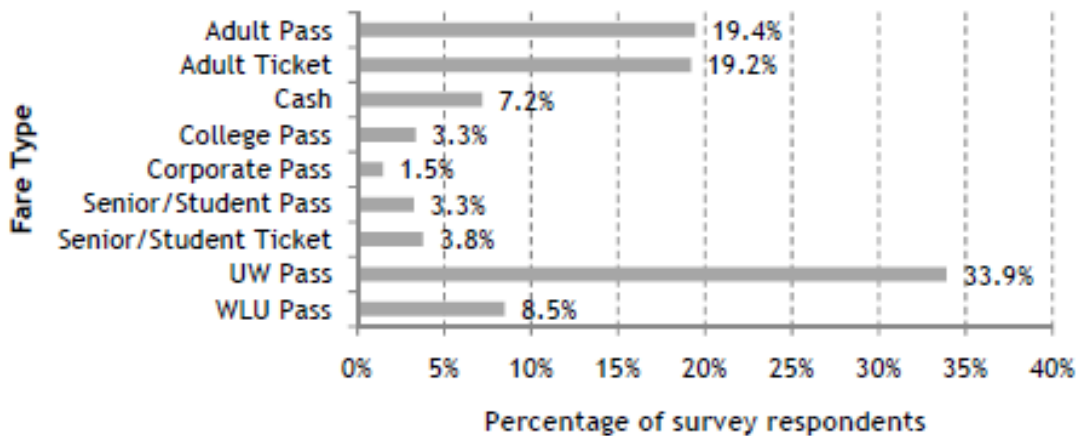


Figure 24: Distribution of iXpress riders by fare type 2008. Source: [http://www.grt.ca/web/transit.nsf/0/F6DE7F8752F8C8C985257640004DC050/\\$file/Region%20of%20Waterloo%20UTSP%20Final%20Report%20Dec_09.pdf?openement](http://www.grt.ca/web/transit.nsf/0/F6DE7F8752F8C8C985257640004DC050/$file/Region%20of%20Waterloo%20UTSP%20Final%20Report%20Dec_09.pdf?openement)







The implementation of initiatives has been appropriate to deal with increased student demand and the importance of this market.

Conclusion

In Waterloo, students comprise an important share of GRT’s ridership. Transit usage in this market increased by 82% between 2002 and 2009. It is expected that this trend will continue as post-secondary student enrolment continues to increase. Also, the RTMP commits to increasing overall modal share and providing sufficient services for the student market. Therefore, student ridership is expected to provide large positive impacts to GRT’s ridership in the future.

GRT staff recognized the importance of the student market and consult with students on the implementation of projects. Councillors understand some key student issues regarding service provision. It seems that councillors could be better made aware of some of the successes in increasing the number of student riders. The Region’s overall level of understanding of student transit needs has been very good.

Initiatives like the U-passes, iXpress route and expanded service in student areas turned around a loss of student riders in the 1990s to a strong increase in each year of the 2000s. The Region continues to plan expansions in student areas in the future.

DEMOGRAPHICS – STUDENTS			
Municipality’s Level of Response →	Staff Awareness	Policies/Guidance	Implementation
Impact of Factor on Transit Ridership ↓			
+	WATERLOO - Waterloo has had strong growth in student ridership, and it is expected that increasing enrolment in post-secondary schools will, in part, maintain this growth		
	 - GRT staff understand student ridership trends and needs - Councillors are aware of some key student concerns	 - RTMP plans for expansions in student areas in short, medium and long terms	 - Programs have been very successful at attracting student riders, reversing ridership losses from the 1990s
+			
-			
-	KINGSTON - Kingston’s ridership is suffering due to losses in student ridership, and the student market base may contract rather than expand, at least in the high school demographic		
	 - Kingston Transit staff recognize this important market segment - However, councillors do not seem to realize that student ridership has been decreasing	 - KTMP fails to outline specific and targeted strategies to increase student ridership	 - Transit programs for students have not increased ridership - Implementation of new student-requested route is hoped to reverse loss of riders
○			

Immigrants | Literature

According to the literature, immigration contributes substantially to transit use, at least in the short-medium term. Figure 25 is a diagram that shows the possible relationships between immigration and transit ridership. These relationships are explained below.

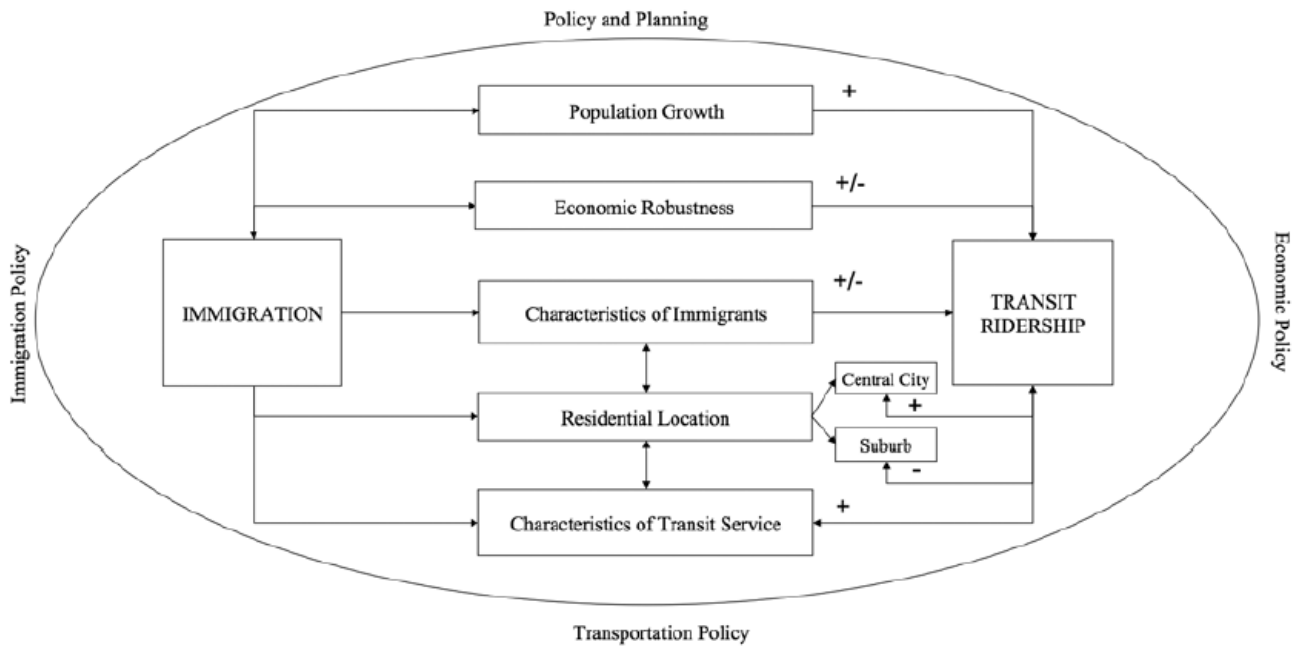


Figure 25: Effects of immigration on transit ridership. Source: Blumenberg and Evans, 2010, p. 26

High rates of immigration contribute to population and employment growth. A larger municipal population due to an influx of immigrants equates to a larger market base for transit service, which translates into higher ridership. In fact, in Canada, immigration provides two-thirds of the country's population growth, and by 2030 it is expected that immigration will be the only growth factor. Canadian transit ridership will become more dependent on immigration, given this prediction.

Not only does the number of immigrants boost ridership, but also the characteristics of new residents increase the transit-using likelihood compared to native-born adults. For example, in the state of California, immigrants account for nearly 50% of all transit commuters, but only comprise 26% of the state population (Blumenberg & Evans, 2010, pp. 23 & 25). The reasons why immigrants are more frequent transit users in California and elsewhere is because they very

often cross-cut other demographic groups that have a propensity to use transit. These other groups include low income people, those who do not own a car, those who originate from a country with a low prevalence of car use and/or a country with high transit usage (e.g. developing countries), and people who live and work in high density areas (Blumenberg & Evans, 2010).

While these demographic traits may hold for a short or medium period, immigrants' use of transit later diminishes once the new residents acquire personal vehicles and adapt to auto-oriented travel. This is the typical pattern. An immigrant will move from a less developed country to a more developed one. They will settle in a larger city because that is where job opportunities are believed to be, and because large urban centres often have established ethnic enclaves. Immigrants are attracted to such enclaves because they provide the businesses, services, institutions, social and cultural support, housing affordability and transit connections needed to aid the transition into the new city. The enclaves may attract more immigrants and become high density neighbourhoods themselves. After a period, immigrants then tend to leave these enclaves once they have built up some income and become settled. Due to their now higher income, the desire to start a family, or other reasons, they move out to the suburbs. Since, in a suburban environment, transit service is more limited and the car becomes a greater necessity, these previously frequent transit users may lessen or eliminate their use of transit (Blumenberg & Evans, 2010, p. 27). Statistics support this theory: more settled immigrants (who have lived in the U.S. for 10 years or longer) are twice as likely as recent immigrants to own vehicles. Residential choice, therefore, is linked to an immigrant's transit usage.

While settled immigrants may reduce or even eliminate their transit use over time, they still represent an important market for transit agencies, as do newly arrived immigrants. Settled immigrants are half as likely as native-born Americans to own a vehicle (Blumenberg and Evans, 2010, pp. 27-28). Therefore, they may still carry some of the characteristics of transit-propensity that they did when they first settled. Transit planners "ought to be concerned about immigrant ridership and, therefore, adopt ridership retention policies to retain immigrant transit users" (Blumenberg & Evans, 2010, p. 38).

Some policy options to attract immigrant riders include the following, which are not sufficient as stand-alone strategies but must be part of a suite of efforts to retain this transit demographic (Blumenberg & Evans, 2010, p. 39).

- Transit information provided in multiple languages
- Service improvements within immigrant neighbourhoods, such as better coverage, increased frequency and easier transfers
- Alternatives to traditional fixed-route service that may emulate travel experiences in an immigrant's country of origin, such as taxis, jitneys, limited route deviation buses and bicycles

Immigrants | Kingston

Current Conditions

Kingston's immigrant proportion is 14% of the population, which is low compared to the Ontario average of 28%. The proportion is in range with selected peer cities that, like Kingston, have a small to mid-sized municipal population and/or are somewhat isolated from a major urban centre (Figure 26). However, while "cities such as Guelph and Peterborough have seen decisively more growth" in immigrants, Kingston's immigrant growth has remained constant at around 380 new permanent residents a year since 2000 (Hendra, 2010; KIP, 2010, p. 6). City size and distance from the nearest large city (Toronto or Ottawa) may partially explain the consistently lower immigration percentage in Kingston. Figure 27 displays the growth in immigrants within Kingston and other cities in Canada.

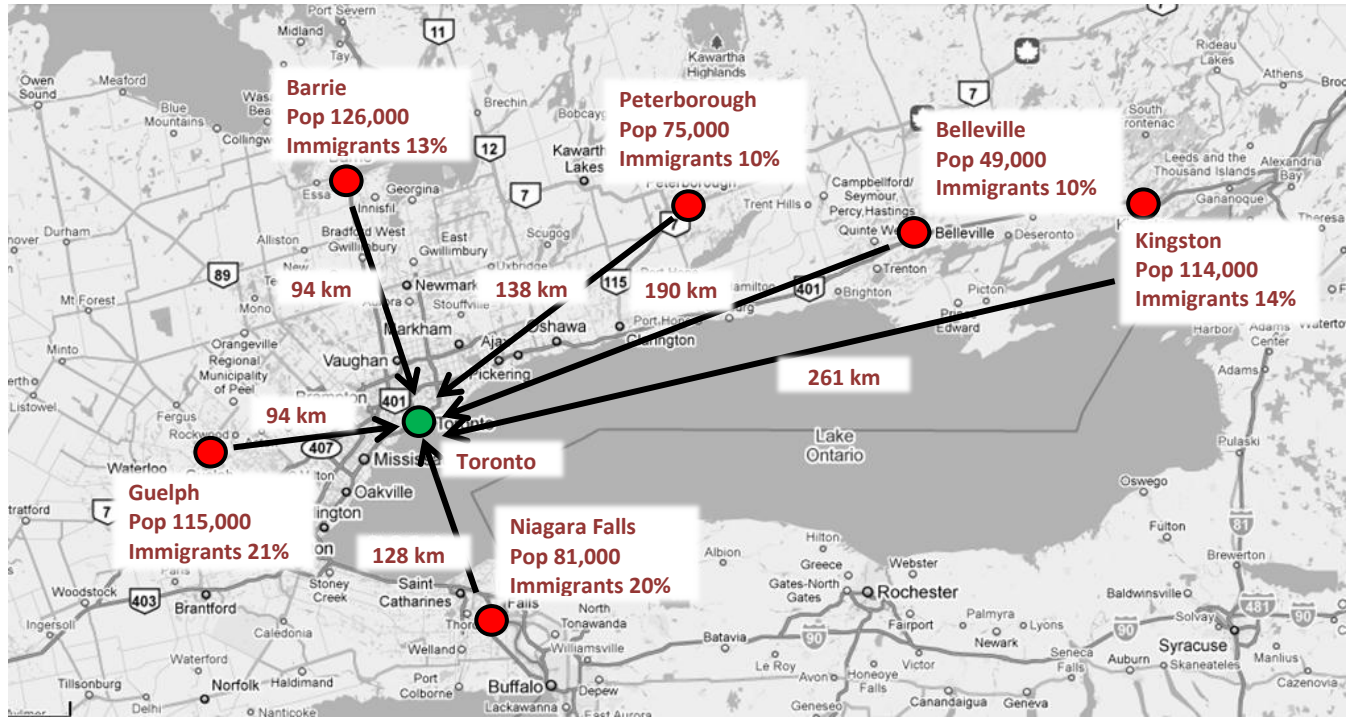


Figure 26: Immigration rates, population and proximity to Toronto in Kingston and peer cities. Statistical source: Statistics Canada, 2006

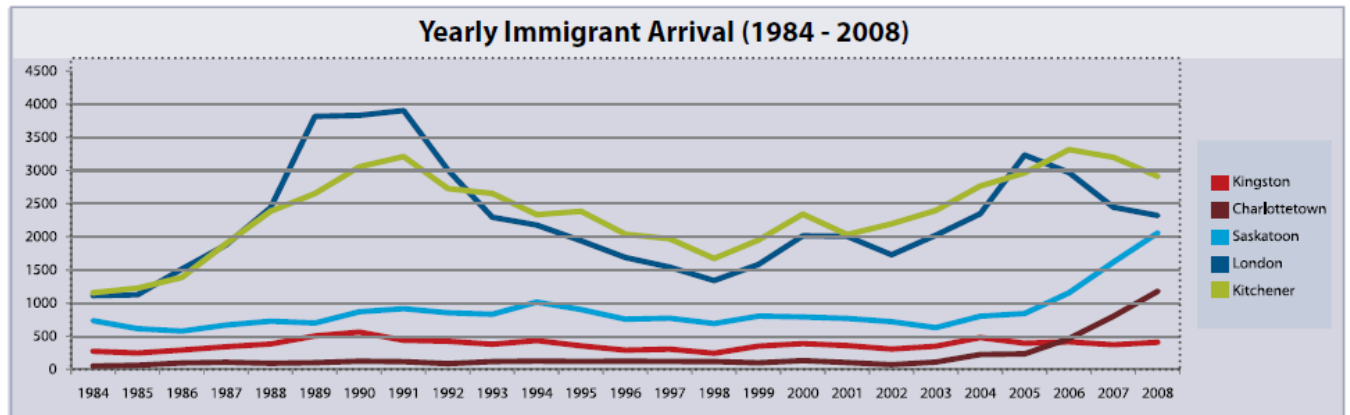


Figure 27: Immigrant arrival in Kingston and other Canadian cities, 1984-2008. Source: KIP, 2010, p. 7

The majority of immigrants in Kingston are in the “settled” group – described as those who have lived in the city for 10 or more years. Almost every three in four arrived before 1991; by comparison, the Ontario and Canada averages are about half of immigrants arriving prior to 1991 (KIP, 2010, p. 6). The Kingston Immigration Partnership (KIP) Strategy 2010 reports that there is a growing diversity gap between Kingston and larger Canadian cities. Kingston’s

proportion of immigrants is not predicted to increase substantially in the next 20 years, but the proportions in other cities like Toronto, Ottawa and Waterloo will grow, hence the gap. The majority of immigrants in Kingston are from the United Kingdom, and other countries of origin include Portugal, Holland, Germany and the U.S. However, countries in Asia, Africa and Central and South America may become the most common places of origin.

A large portion of immigrants eventually leaves the city to live elsewhere. KIP reports that, between the 1990s and 2006, about one-third of immigrants had left. Furthermore, in 2010, 40% of new immigrants surveyed expected they would be living elsewhere in five years (2010, p. 2).

While data were not available from city staff regarding transit ridership and immigrants, there is information that helps characterize a typical immigrant residing in Kingston. Regarding country of origin, 69% of immigrants who arrived in 2008 were from Africa, Asia and Central and South America. The remaining 31% were from the U.S. and western Europe. In terms of educational achievement, according to the KIP website, 77% of new immigrants have a university degree, trade certificate or non-university diploma. The vast majority of new immigrants, 89%, have an advanced occupational level (professional, managerial, skilled or technical), while the remaining 11% are in clerical or labour occupations. The majority (69%) are also 25 years of age or older, which suggests that the majority are able to work and produce an income. The largest concentrations of both recently arrived and settled immigrants are in the city's downtown, along the main (Princess St) corridor, in the area of Queen's University/ St. Lawrence College, and in the west end near Kingston Centre (green and blue sections in Figure 28). The west end is attracting newcomers, whereas the downtown areas were more popular for settled immigrants (pre-1991).

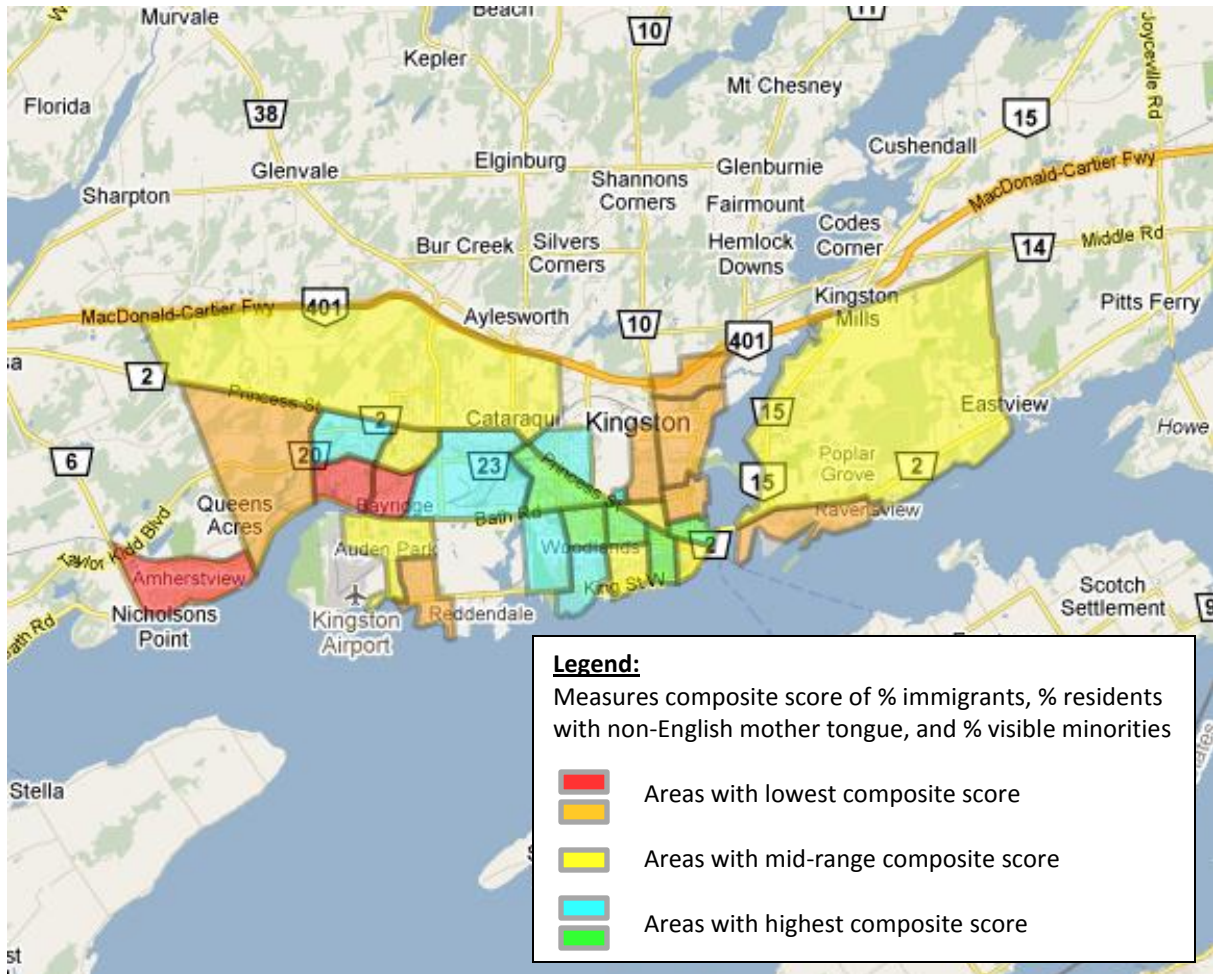


Figure 28: Immigrant residential locations in the City of Kingston, 2006. Source: Kingston Immigration Partnership website

This profile of the Kingston immigrant is helpful in comparing to the literature on a typical transit rider. The majority of Kingston’s newcomers are from countries where English is probably not the native language. A mono-linguistic Kingston Transit service may discourage non-English speakers from using transit.

They are older, well-educated and can gain well-paying professional jobs. Higher educational and occupation levels may mean that a new immigrant’s income is high enough that they can afford to buy a car even upon recent arrival in Kingston.

In the past, immigrants lived in the city’s downtown, but are increasingly locating in the west-end suburbs. This is also where much suburban residential development is occurring; therefore,

whether due to the available housing stock or due to immigrant housing preferences, many newcomers will be living in low density, single-detached housing. While a new immigrant may have a greater propensity to use transit than the average resident may, they may be pushed to driving instead due to living in an area that is low density and less well served by transit. The more settled immigrants live in the higher density downtown, where transit use is usually higher, but settled immigrants may be car owners since they are established.

These characteristics of the typical Kingston immigrant – including the suburban locational choice of new immigrants – and the KIP report that states many immigrants eventually leave the city suggest that the immigration factor will have little to no impact on Kingston’s transit ridership in the next 10 or so years.

Staff Awareness

Kingston interview respondents give a “not significant” rating to immigration, indicating that they do not think it will be an influence on transit ridership in the next 10 years. K1 observes that immigrants tend to locate in large urban centres like Toronto or Montreal, and expects the immigrant ridership impact to be “quite low.”

Councillors characterize Kingston as a city of low ethnic diversity, which is consistent with the interview results. The councillors do not mention immigrants when asked about primary concerns regarding transit, and this suggests a lack of awareness or lack of priority regarding immigrants’ transit issues in the city. However, this level of awareness is appropriate since it is expected that immigrants will contribute little to the ridership growth of Kingston Transit.

Policies/Guidance

To retain more immigrants and to improve the city’s service delivery for them, the KIP Strategy 2010 was created. The strategy identifies the immigration trends outlined above and it provides action items in eight focus areas to be put in place within five years.

One of these focus areas is Housing, Transportation and Family Services. Four goals are contained within this focus area, one of which being to make the transit system effective for newcomers. The action items are to provide transit information (including the online trip

planner) in multiple languages, host transit orientation sessions, provide free and discounted passes to newcomers, seek feedback from immigrants on transit services, train staff on cultural diversity, and relay newcomer feedback to staff (KIP, 2010, p. 23). These initiatives are somewhat prudent since non-English speaking immigrants are becoming more common and since newcomers are expected to more likely to depend on transit, particularly in their first year in Kingston. Kingston Transit staff were involved in the strategy formation. Interview respondent K3 adds that they will be providing language documents and sensitivity training for drivers.

These initiatives may boost ridership among the immigrant population in the short- and long-terms. Compared to the literature, the initiative to increase language diversity in transit service is appropriate. However, due to the consistently low number of immigrants actually arriving in Kingston, these efforts may not “pay off” in terms of ridership.

The KTMP does not have any information about immigrant trends or strategies. There are also no data available from staff on immigrant ridership. These guidance pieces would further help to identify specific immigrant service issues. However, much like the KIP action items, it is questionable whether efforts to attract the small immigrant population would help to boost ridership. The lack of policies for this factor is appropriate, given the information in the Current Conditions section.

Implementation of Initiatives

The current and previous capital budgets for transit, at least in the last 10 years, have not specified immigration-related strategies for improving transit service. The KIP Strategy’s transit action items – multi-language transit information, free passes for newcomers, driver sensitivity training, etc. – have not yet been implemented. While this lack of implementation appears to be a failure concerning this external factor, it is considered appropriate in this analysis given the low influence that immigration will likely have on the city’s ridership. Only when immigration forecasts can demonstrate a significant opportunity to grow ridership should these plans be put into place.

Conclusion

While immigrants represent a market of frequent transit users, at least the newly arrived subset, it is expected that immigration will have a low impact on Kingston's transit ridership. Kingston's immigration rate is historically low and is expected to stay low.

Staff have created the KIP Strategy to retain immigrants and provide services they need. Part of that strategy is to promote the transit system. These efforts may help attract and retain a certain number of immigrants, but it is uncertain how successful the efforts will be and whether municipal resources should be spent. Whether the efforts will be useful or not, the city has some level of understanding regarding the city's immigrant trends. The lack of data on immigrant ridership is a gap in information that can help determine the need for immigrant-attraction strategies for transit; for the time being, this factor should not be a priority.

Immigrants | Waterloo

Current Conditions

Immigrants comprised 22% of Waterloo Region's population in the 2006 census, and the region has one of the highest per capita immigrant populations among urban areas in Canada (Region of Waterloo¹¹, 2006, p. 1). Figure 29 shows similar proportions of immigrants in other medium and large municipalities in southern Ontario.

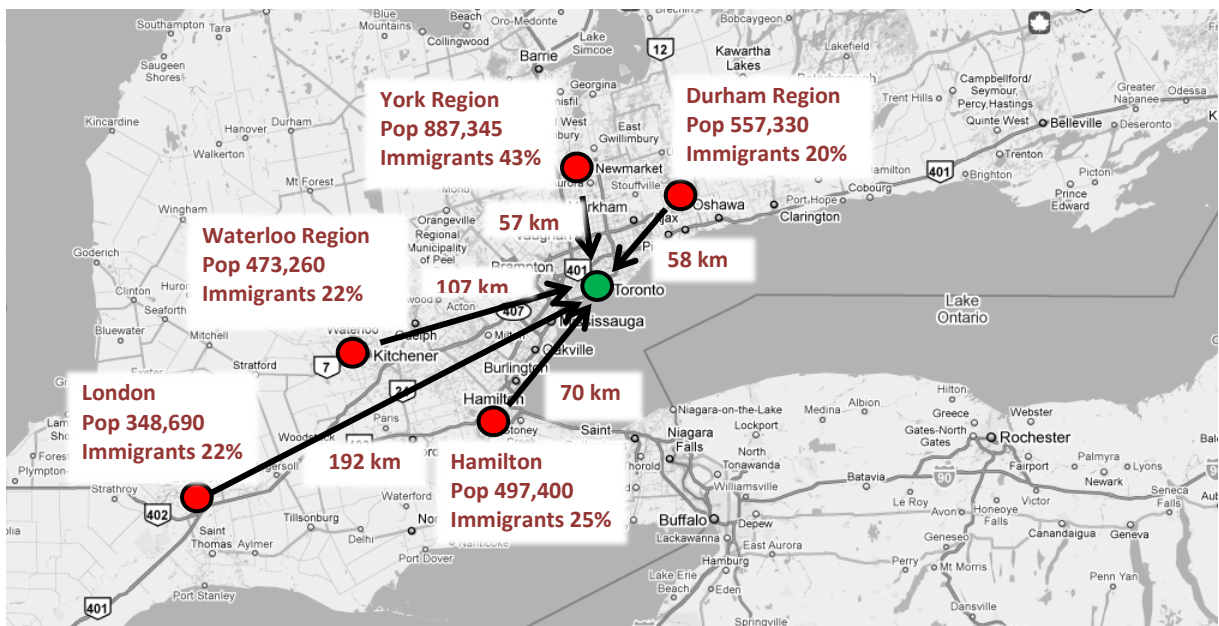


Figure 29: Immigration rates and population in Waterloo and peer cities/regions. Statistical source: Statistics Canada

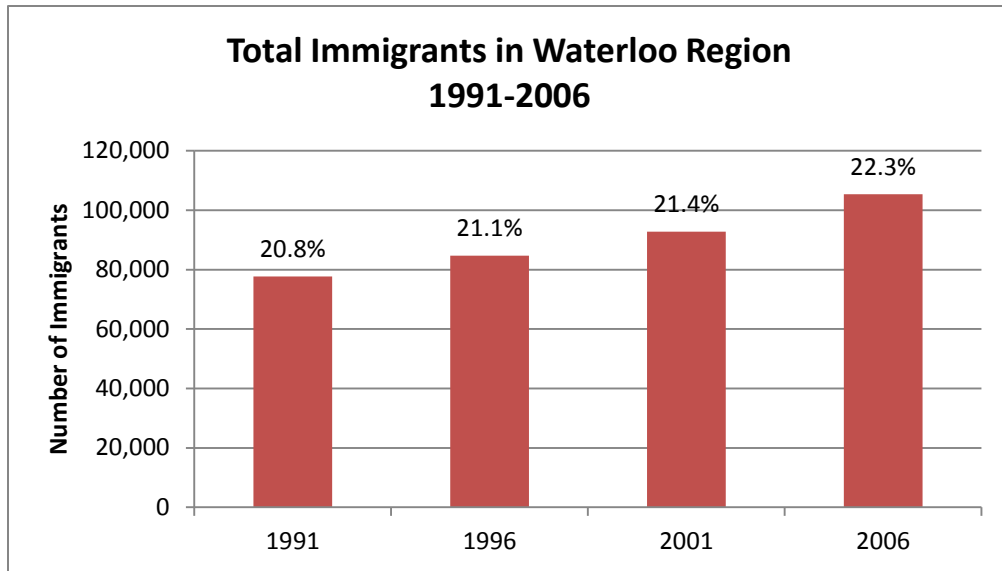


Figure 30: Immigrant population and proportion of immigrants relative to total population in the Region of Waterloo, 1991-2006. Statistical sources: Region of Waterloo¹¹, 2006, p. 2; Statistics Canada, 2006

In terms of the geographical distribution of immigrants in the region, the four townships (Wellesley, Woolwich, Wilmot and North Dumfries) have the highest proportion of immigrants who settled before 1971. Cambridge has the highest proportion of immigrants who arrived in the 1970s and 1980s. The greatest number of the most recent immigrants, arriving in the 1990s and later, has settled in Kitchener and Waterloo (Region of Waterloo¹¹, 2006, p. 3).

Figure 31 shows the distribution of recent immigrants and the location of the Central Transit Corridor. The highest concentrations of recent immigrants are along the CTC or in suburban areas that are currently served by transit. This is good news for transit. By settling in urban areas, new immigrants help increase the population density of areas most efficiently served by transit, which in turn encourages transit use. Further, recent immigrants are more likely to use transit than are long-settled immigrants. A population group that is likely to use transit combined with a location well-served by transit thus predicts higher ridership for GRT.

Distribution of Recent (10-year) Immigrant Population by Neighbourhood in Waterloo Region 2001

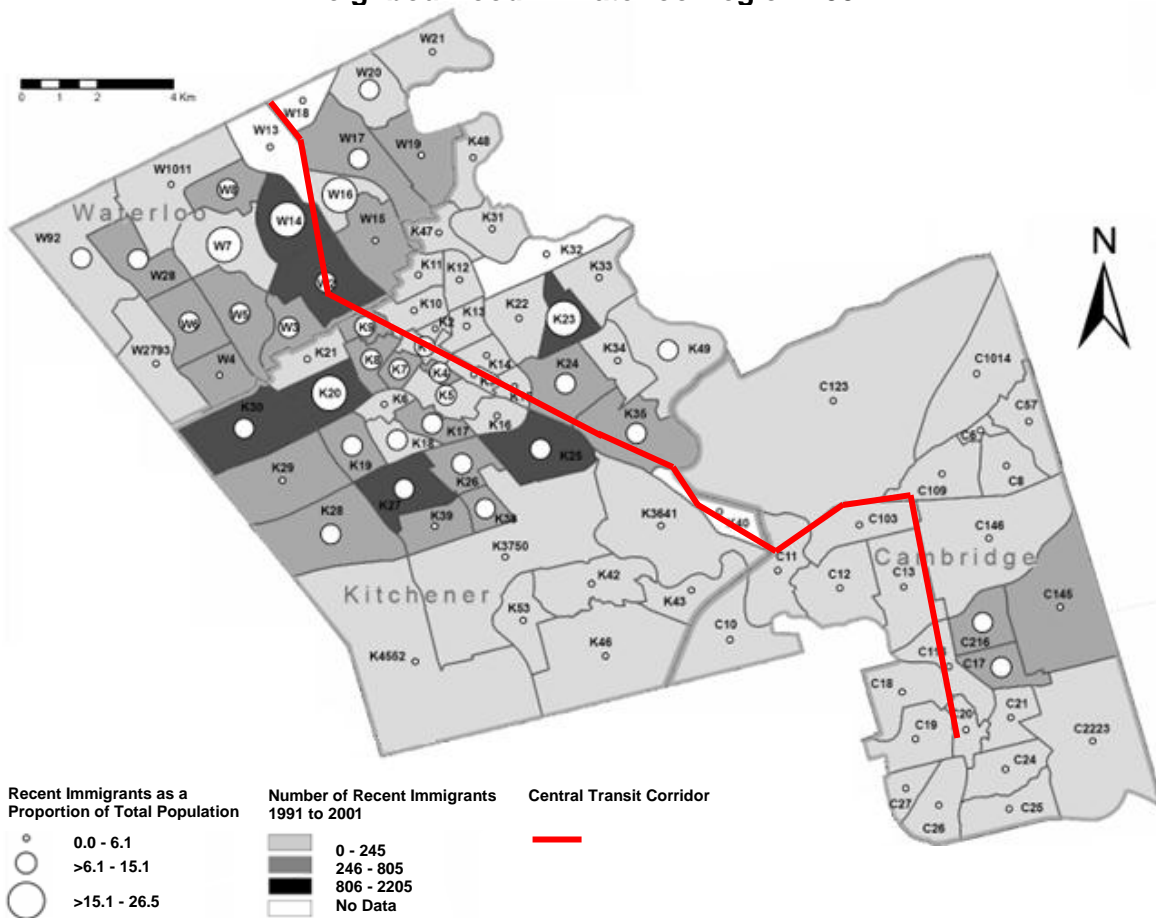


Figure 31: Immigrant residential locations for recent immigrants in Waterloo Region, 2001. Source: Region of Waterloo¹¹, 2006, p. 5

Data were not available from region staff regarding transit ridership and immigrants. The profile of the typical Waterloo Region immigrant is as follows, with data from the Region’s 2006 report on immigrants and growth and the 2009 immigrant fact sheet (Region of Waterloo¹¹, 2006; Region of Waterloo¹², 2009). The largest category of immigrants (44%) arriving to Waterloo between 1996 and 2008 were economic immigrants. This category of immigrants includes skilled workers, entrepreneurs, investors or self-employed people. Recent immigrants are highly educated, with 49% of men and 37% of women holding university degrees in 2001. The top five countries of last permanent residence in 2008 were China, India, the U.S., the U.K. and Romania. Therefore, two of the five major originating countries are Anglophone. Most

immigrants (67%) knew English before arriving in Canada and the majority learn the language after a few years upon resettling.

However, despite holding university degrees, living in growing urban areas with job opportunities, and having English speaking skills, a third of recent immigrants lives on low income, and this percentage has increased rather than decreased. Recent immigrants are more likely to have a low income compared to immigrants who arrived in 1995 or earlier. Waterloo is also home to many secondary immigrants, who are immigrants who relocated to another Canadian city before resettling in Waterloo. In the cities of Kitchener and Cambridge, 20% of the immigrant population is in this category, and in the city of Waterloo, 40% of immigrants are in the secondary group (Region of Waterloo¹¹, 2006, p. 6).

Based on this profile, some characteristics of a typical Waterloo immigrant predict a higher tendency to use transit. Along with tending to relocate in the urbanized parts of the region, newcomers are often low income earners, despite being well educated. Low income earners are more dependent on transit services than high income earners. There is no significant language barrier to using the GRT system as most immigrants can speak English.

Three of the characteristics, in contrast, would not predict a higher likelihood for transit use. Since the immigrants are educated and skilled, they may have a shorter progression between arriving in the region and finding well-paying work. The fact that many are secondary immigrants means the progression may be faster still. With well-paying work comes higher income and the transition from being a captive transit rider to a choice rider. Also, the U.S. and the U.K. are car-dominated countries and the many immigrants originating from these countries may bring their driving behaviour with them.

Immigration likely contributes to ridership growth in the region, since it contributes to population growth and some of the characteristics above suggest that immigrants will have a propensity to use transit. However, the magnitude of ridership growth may be tempered due to the other traits of a typical newcomer. This factor may contribute a small positive ridership impact.

Staff Awareness

GRT staff give the factor of immigration an overall rating of “significant” to the region’s transit ridership over the next 10 years, with one respondent saying “not sure” and another saying “significant maybe.” Interview respondent W1 says of the immigrant population, “we’re seeing a lot of them who are using [transit] more often.” Immigrant families, W2 points out, often create multi-generational households (e.g. grandparents, children and grandchildren living together). Such households increase the density of a neighbourhood, especially if the neighbourhood has a higher concentration of similar ethnic families. Respondent W2 says, “I did a lot of the population forecasting way back, 8 or 9 years ago – immigration levels is a big chunk of population increase.” With population increase alone, more ridership is likely to follow. The interview data show that GRT staff are aware of the growth trends in immigration.

Councillors’ responses indicate an awareness of the region’s growing ethnic diversity. However, they do not specify transit needs of immigrants when asked about primary transit service concerns among residents. It is unclear what impact immigration may have on ridership, so it is unclear whether councillors should pay more attention to this demographic factor. Both staff and councillors would benefit, then, from more baseline data and information about immigrant ridership habits. Overall, though, their awareness of this factor is appropriate.

Policies/Guidance

The Region produces several immigrant fact sheets that provide statistics on immigrants. These fact sheets lack data on the transportation – and specifically transit – choices of immigrants, resulting in a gap in knowledge. A 2010 report produced by the Waterloo Region Local Immigration Partnership Council (WRLIPC), in partnership with Waterloo Region and other local organizations, was created to develop a strategy for helping to settle and integrate immigrants in the region. The report looked specifically at the availability of English language services and barriers to these services. The report (WRLIPC, 2010, pp. 6 & 31-32) finds that 32% of 98 newcomers surveyed for the report found that a major barrier they face is lack of transportation, particularly for getting to and from English language classes, especially in winter. Transportation posed a significant cost, since GRT’s transit discount is only available to refugees or those on social assistance.

To address this issue, WRLIPC recommends the provision of decentralized English language services in neighbourhoods with concentrations of immigrants. Community centres, schools, religious buildings, libraries and other public spaces could be facilities to increase the accessibility of these and other services. Another recommendation is to provide a shuttle bus between immigrants' residences and these services, similar to shuttles provided for school children (2010, pp. 39-40).

From a GRT perspective, perhaps a strategy should be developed for improving transit service to the immigrant demographic, including implementing the WRLIPC recommendations. The RTMP does not provide any information regarding immigrants. A baseline study of immigrant travel patterns would help determine the major origins and destinations, and GRT could collaborate with regional immigration organizations.

The Region has room to improve their policies and guidance materials related to immigration and transit. Immigration is predicted to contribute some ridership for GRT, but there is insufficient ridership data and no strategy to consider this demographic group.

Implementation of Initiatives

GRT does not have a publicly available strategy that addresses immigrants' transit service needs, nor are there specific transit projects intended to encourage ridership within this demographic. Also, the transit capital budgets throughout the 2000s do not plan any projects specifically geared to immigrants. Due to the absence of immigrant ridership data, there should be at least an assessment of immigrant trends pertaining to transit. The Region produces immigrant fact sheets – these would be useful to GRT when combined with related transit data. A baseline assessment would determine the need for future programs targeting immigrants.











Conclusion

The Region of Waterloo has a growing immigrant population. By 2031, approximately one-third of the region's population is expected to be immigrants. Therefore, about one-third of GRT's potential ridership base will be immigrants. This is a significant number. However, without knowing the percentage of immigrants who use transit, it cannot be determined that immigration will contribute substantially to ridership in the future. The profile of the immigrant suggests a

settled, educated and car-driving resident – in other words, a choice rider rather than a captive rider. It is expected that immigration will contribute small increases in ridership due to the opposing forces of immigration population growth and the profile of a choice transit rider.

Staff are unsure what impact the immigration trends have on transit ridership, and councillors thusly are unaware of any important gaps in service or missed opportunities. While this level of awareness is appropriate for the time being, a basic understanding of this opportunity should be clarified in the future among staff and councillors.

The Region has partnerships with immigration organizations to identify gaps in service and assist in the relocation transition. Specific transit data and strategies to encourage transit use are missing. Therefore, more can be done to identify immigrant transit needs and put in place initiatives to encourage ridership.

DEMOGRAPHICS – IMMIGRANTS			
Municipality's Level of Response →	Staff Awareness	Policies/Guidance	Implementation
Impact of Factor on Transit Ridership ↓			
			
	WATERLOO - The immigrant population is expected to increase, but may not provide significant ridership		
	 <ul style="list-style-type: none"> - There is an unclear picture among staff and councillors of immigrant ridership and their needs 	 <ul style="list-style-type: none"> - WRLIPC report indicates transportation is major barrier for immigrants, but RTMP does not outline immigrant strategies 	 <ul style="list-style-type: none"> - There are no transit initiatives for immigrants; a baseline data study seems to be required
			
	KINGSTON - Kingston's ridership is not expected to increase from immigration, due to low levels of immigrants and trends suggesting newcomers may not be likely candidates for transit use		
	 <ul style="list-style-type: none"> - There is an unclear picture among staff of immigrant ridership, and the factor seems to be a low priority for councillors - However, this is appropriate due to the low expected impact of immigrants 	 <ul style="list-style-type: none"> - There is some guidance to attract immigrants, but this is not expected to be fruitful due to the low influence of this factor - The KTMP lacks immigrant-related policies, but this is appropriate 	 <ul style="list-style-type: none"> - The KIP Strategy's transit action items have not yet been implemented - A baseline data study would help determine immigrant influence on ridership

4.3 Regional Location

Literature

Public transit ridership can be affected by the ‘luck of the draw,’ that is, where a city happens to be located and how the surrounding area happens to develop. Location places a municipality within its regional environment and influences its role (evolving or static) in the hierarchy of this environment (Yago, 1984, p. 16). Yago writes, “the more central a city is within the national urban system, the greater are the demands upon it to coordinate regional activities and control economic development” (1984, p. 16).

This is true for transportation. A central city’s transit agency will have more reason – and probably more resources – to coordinate its transportation system with the larger regional system, particularly between other large nearby cities. The gravity model provides the theoretical base. According to the model, two factors affect the amount of flow or interaction between any two points: population and distance. Figure 32 represents these two factors using four hypothetical cities. Out of Cities 2, 3 and 4, City 1 will have the most interaction with City 4 because both are very large cities at one million people each and because the distance between them is the shortest (250 miles). The travel flows (by air, road, rail, etc.) will be heaviest between the two cities. By contrast, City 1 will have the least interaction with City 3 since the latter city’s population is the smallest and the distance between the cities is greater. The amount of interaction and travel flow between City 1 and City 2 will fall somewhere between the City 1-4 pairing and the City 1-3 pairing.

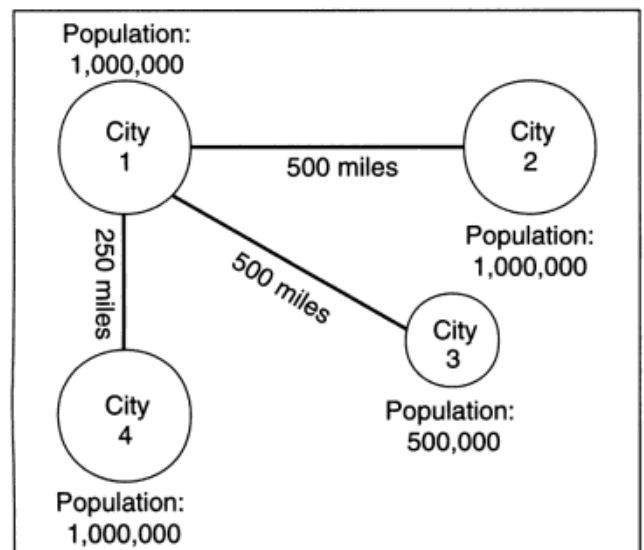


Figure 32: Gravity model of expected inter-city interaction based on population and distance. Source: Taaffe, Gauthier & O’Kelly, 1996, p. 196

In terms of the effect of the gravity model on transit, if there are heavy flows between cities or regions, it stands to reason that this will provide extra impetus for the local transit systems of

each city to be improved to accommodate this high level of interaction. (Similarly, the local roads would need to accommodate more commuters between cities.) For example, Toronto's Union Station is a terminal for the city's subway system, provincial GO Transit trains and national VIA Rail trains. The subways must provide enough capacity to move thousands of travellers to and from these terminals each day. To do this, a sufficient number of subway trains must be operational at any one time. By adding subway trains on the line that feeds into Union Station, the frequency of the subway at the Union Station stop increases and the frequency at each stop along the line also increases, thereby benefiting all riders of the line. In addition, intercity transit riders may be more likely to use the local transit system than out-of-town commuters who drove into the city. Regional transit hubs are precipitated by a municipality's location, and location can help increase local transit ridership.

Kingston

Current Conditions

Kingston is somewhat isolated geographically, being over two hours away from Ottawa, three hours away from Toronto, and bounded on its entire southern portion by the St. Lawrence River. The closest city is Belleville, which has only about 50,000 people and is a one-hour drive. Figure 33 shows the isolation from major urban areas by measuring the distance to cities with at least the same population as Kingston (119,700). The intent is to illustrate the long distance between Kingston and the closest city with at least its population size, and hence the weak regional transportation connections as predicted by the gravity model. The closest such city is Ottawa.

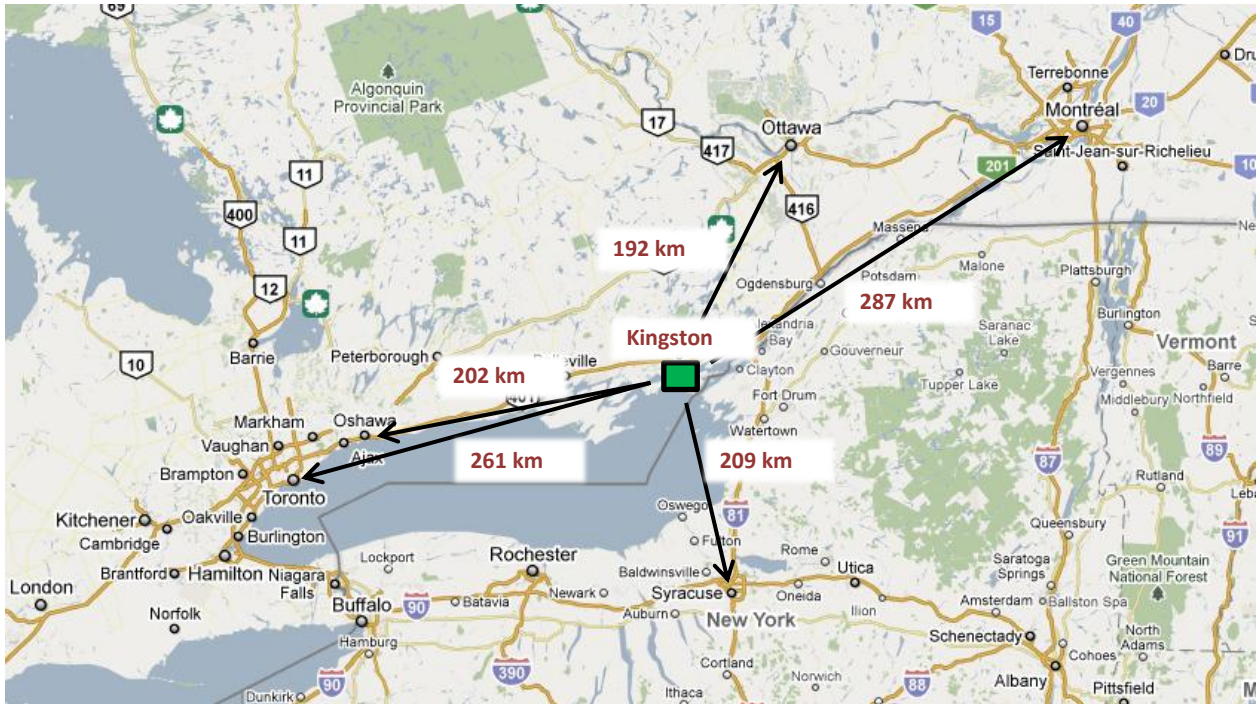


Figure 33: Distance from Kingston to other urban centres

While the gravity model suggests that there is little traffic generated between Kingston and other urban areas, a small percentage (8%) of commuting residents travels from Kingston to adjacent municipalities for work (Figure 34). Another 29% of non-Kingston residents commute into the city from adjacent municipalities (Figure 35). Loyalist Township is the main in-commuting originator and South Frontenac Township is the main out-commuting destination. Except for Frontenac Islands, which requires ferry access, all commuting destinations into and out of the city are more than 20 km away. This is important to note because for trip lengths 20 km or longer, the only modes of transportation used are car (89%) or bicycle (8%). School buses comprise the remaining 3% (City of Kingston⁵, 2009, chap. 11, p. 9). Clearly, Kingston Transit is not capturing any of these distant commuters unless some of the commuting cyclists decide to dismount their bike and ride the remainder of their trips using transit.

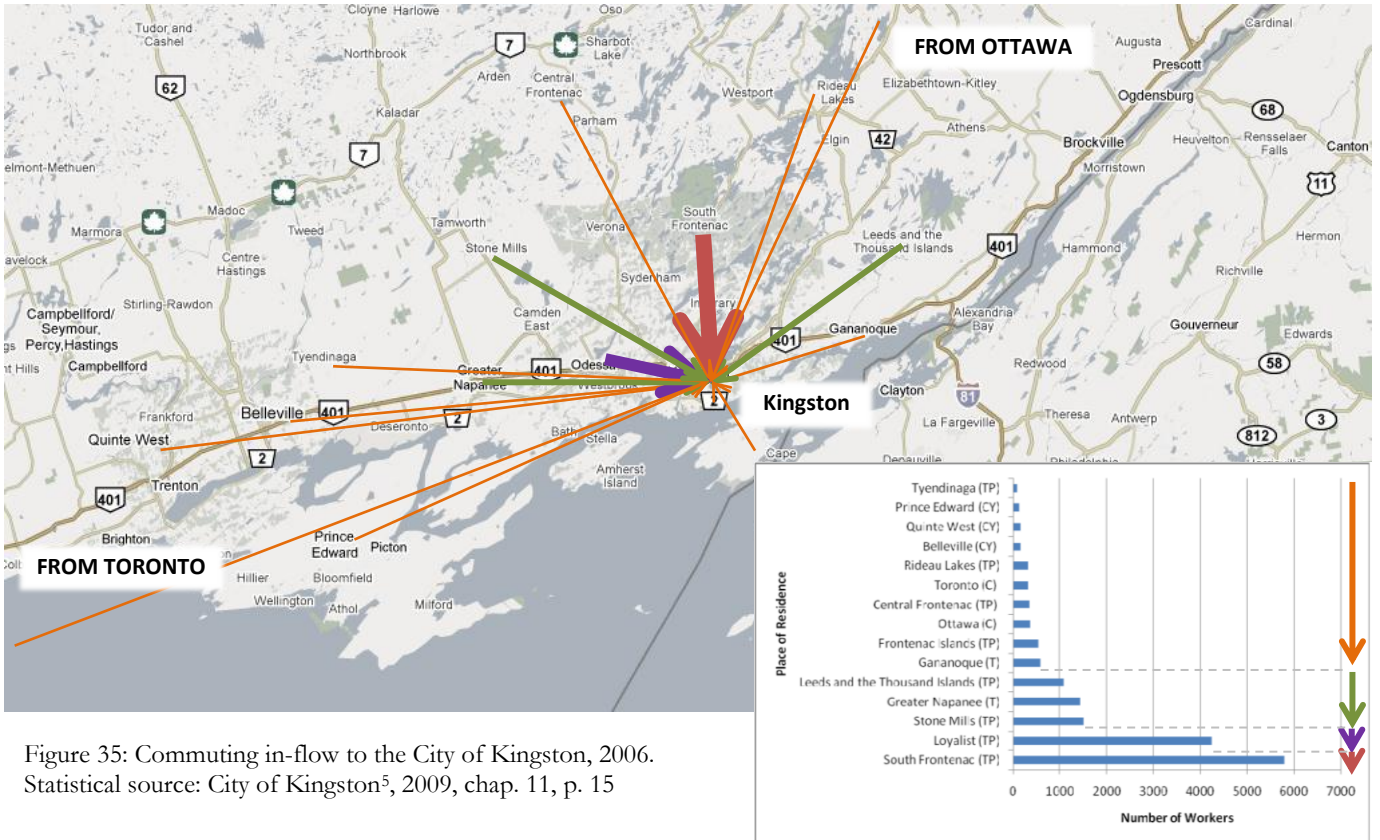


Figure 35: Commuting in-flow to the City of Kingston, 2006. Statistical source: City of Kingston⁵, 2009, chap. 11, p. 15

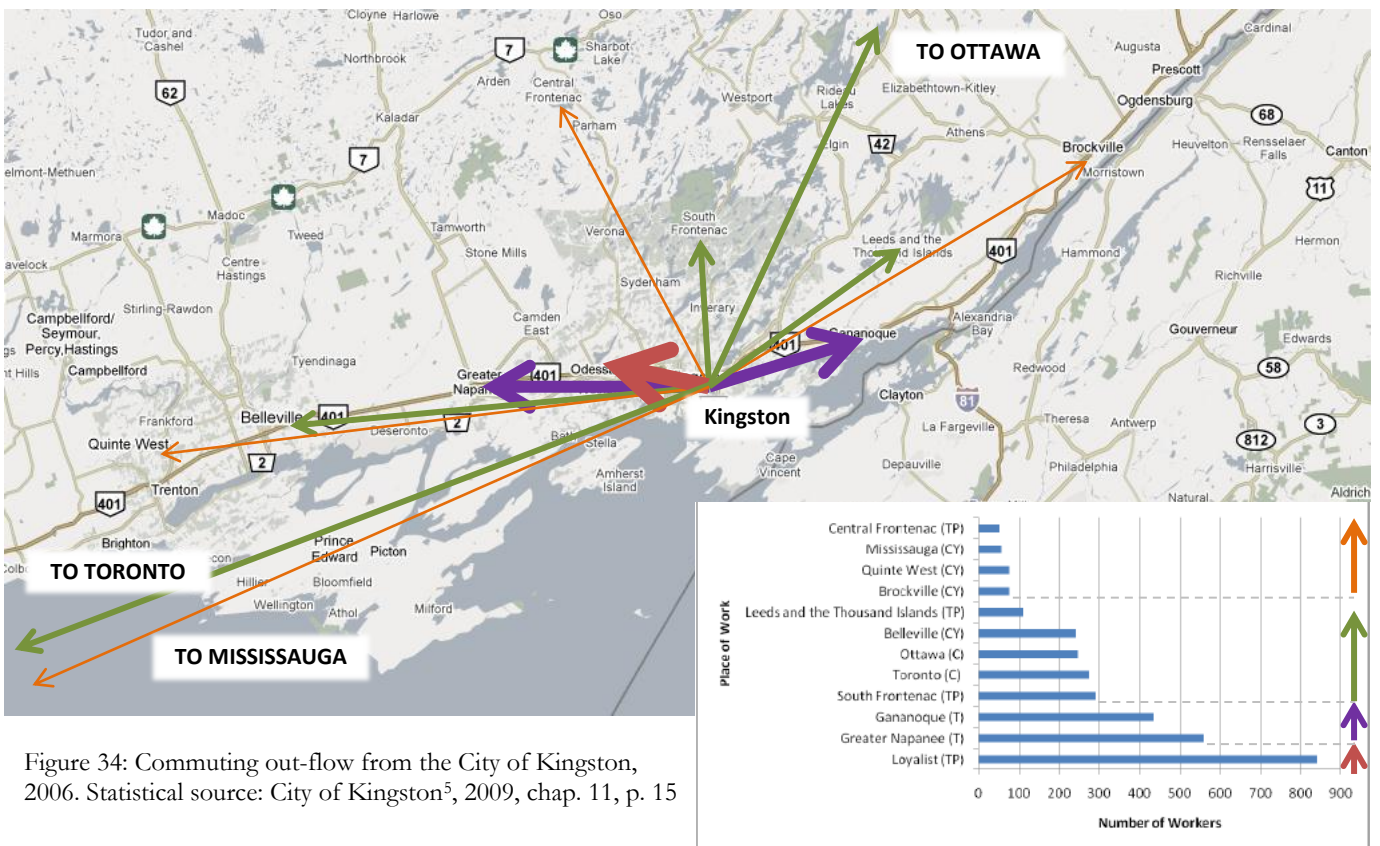


Figure 34: Commuting out-flow from the City of Kingston, 2006. Statistical source: City of Kingston⁵, 2009, chap. 11, p. 15

The above three maps show the relative isolation that limits Kingston's opportunity to participate in a regional transportation network. The top four in- and out-commuting destinations for the 8% of people who do not both live and work in Kingston are within 43 km of the city. They are Loyalist, South Frontenac, Greater Napanee and Gananoque. These communities average 13,500 residents, so they are too small to contribute to a transit network that could be coordinated with Kingston's. This external factor is expected to contribute no transit ridership for the city.

Staff Awareness

Kingston Transit staff have a good sense of how much transit service residents in adjacent municipalities need. The City has a contract with Amherstview to provide bus service between Amherstview and Kingston's downtown area. The hamlet of Amherstview is part of the Loyalist Township municipality to the west of Kingston and has approximately 6,000 residents.

Transit staff monitor the service needs of the hamlet's residents to ensure the supplied service meets residents' demand. For example, in 2009-2010, KT staff prepared a proposal to introduce express routes to the transit network. As part of this work, staff consulted Amherstview to determine if an express route would be desired by the hamlet, learning that such a route would not be needed. Another example is with the transit ridership potential of rural areas to the north and east of the city (areas just south of South Frontenac Township and toward Gananoque). KT staff have indicated that they are focusing on improving transit within the city proper (essentially, south of Highway 401 and west of Great Cataraqui River). According to staff, service improvements for the rural north are lesser priority items that will be considered at a later time.

It is appropriate for staff to place lower priority on discussing service adjustments for routes to adjacent municipalities. This indicates an understanding of the limited opportunities of attracting regional commuters to the system. It also indicates an awareness of the need to focus on the city's primary transit market: Kingston residents who work in Kingston.

City councillors do not provide many comments relating to the city's geographic location. Councillor KC3, however, believes the city has an advantageous location among major cities –

Toronto, Montreal, Ottawa and Syracuse. In the analysis of Kingston Transit servicing to out-bound or in-bound commuters, all of these cities are too far for KT to coordinate its local network with their respective local transit networks. Therefore, this councillor does not connect Kingston's location with the conclusion that the city has a locational disadvantage with regard to attracting distance commuters to the KT system. The only opportunities offered by proximity to these large cities are transit connections to the city's airport and VIA/Coach Canada stations.

Councillors KC2 and KC4 make accurate statements relating to regional location. KC2 says most young graduates move away from the city due to limited job opportunities. Presumably, they move to larger cities, which have better prospects. Therefore, this councillor understands that Kingston's relative isolation in eastern Ontario impacts the young demographic. This demographic might have a high propensity to use transit if they do not yet own a car or are used to riding transit, but the city loses this ridership market due to job prospects.

Councillor KC4 indicates that residential and industrial growth in the east end of the city, east of Great Cataraqui River, has had no impact on transit ridership in the last 10 years. This statement supports the conclusion that Kingston should not place a priority on improving service for east-end residents at this time. The lower priority that staff and councillors give to this non-influential factor is appropriate.

Policies/Guidance

A municipality's policies or guidance materials that relate to regional location could be about extending or connecting Kingston Transit service to or with adjacent municipalities, or they could be about intercity transportation (longer distance travel involving multiple passenger carriers).

The 2004 Kingston Transportation Master Plan does not provide guidance on transit service provision to adjacent municipalities. It only briefly mentions the need to cooperate with senior governments and adjacent communities in the planning of *roadway* infrastructure, not transit (City of Kingston¹, 2004, p. 54). It also commits the city to maintain dialogue with the County of Frontenac, the Frontenac Islands Township and the Ontario Ministry of Transportation as it

relates to *ferry* service between municipalities. Again, the conventional bus transit system is not mentioned.

Regarding intercity transportation, the KTMP has a one-page section on intercity coordination. The intercity system is described as essential within the transportation system, and the integration with Kingston's local transit is an important component in the KTMP (City of Kingston¹, 2004, p. 64). The policies relating to passenger movements commit the City to support better integration between Kingston Transit's routes and the train and intercity bus stations. They also require the City to support the integration between marinas and the intra-city network (walking, cycling, transit and roads), the viability of the city's airport, and the federal government's high-speed rail initiative between Windsor (Ontario) and Quebec.

Kingston's policies lack specifics on integrating local transit systems. It speaks more to making connections with longer distance carriers such as the train and intercity bus. The KTMP also does not indicate whether opportunities to improve levels of service with adjacent municipalities – such as the contracted service to Amherstview – should be revisited in the future. However, it is appropriate for the KTMP not to place priority on regional connections since the city has little need for this. Local transit improvements within the city should be the focus.

Implementation of Initiatives

Kingston Transit provides only dial-a-ride service to the northern and eastern rural areas within the boundaries of Kingston. South Frontenac, to the north, and Gananoque, to the east, are located close to the borders of Kingston but transit connections between municipalities do not exist. Amherstview contracts Kingston Transit to provide half-hourly or hourly service to the community.

As was mentioned in the “Demographics – Students” section, KT recently implemented route 18, which connects the downtown, Queen's and SLC to the VIA Rail and Coach Canada stations. This greatly improves residents' ability to get into or out of Kingston. The 2010 transit capital budget provided \$250,000 for an improved stop at the VIA station, further improving integration between the KT and VIA networks. These initiatives help to attract more distance

travellers to the city's transit system, which benefits the system in spite of the city's relatively disadvantageous location.

The current level of service provided to adjacent municipalities is appropriate given the low percentage of in- and out-bound commuters.

Conclusion

The isolating geographic location, from a regional transit network perspective, limits the opportunity to capture the regional commuter market, which is nevertheless a small market. Geographic location is not advantageous toward transit ridership in the future and is expected to bring negligible growth.

Staff are sufficiently aware of the opportunities and limitations regarding service between nearby municipalities. The KTMP's lack of policies on local transit integration (with the exception of ferry integration) is appropriate in this case, since in- or out-commuters are not a priority market for KT operations. KT provides service to Amherstview. This is a requested service that currently serves the community well. In the future, it is recommended that levels of service be reconsidered if there is substantial residential growth.

Waterloo

Current Conditions

Waterloo is centrally located among many major urban centres. The region is one and a half hours away from Toronto and London, an hour away from Mississauga and Hamilton, and only 30 minutes away from Guelph. Waterloo Region is the geographic jurisdiction of Canada's Technology Triangle (CTT). CTT is a non-profit economic development partnership that markets Waterloo Region's competitive advantages internationally, including the region's geographic location: in the heart of the most populous province with 5.1 million people within a one hour drive (CTT¹, 2010). Figure 36 maps this regional connectedness, with arrows pointing to urban areas with a population of at least 140,800 (the average of the three cities that comprise Waterloo Region).

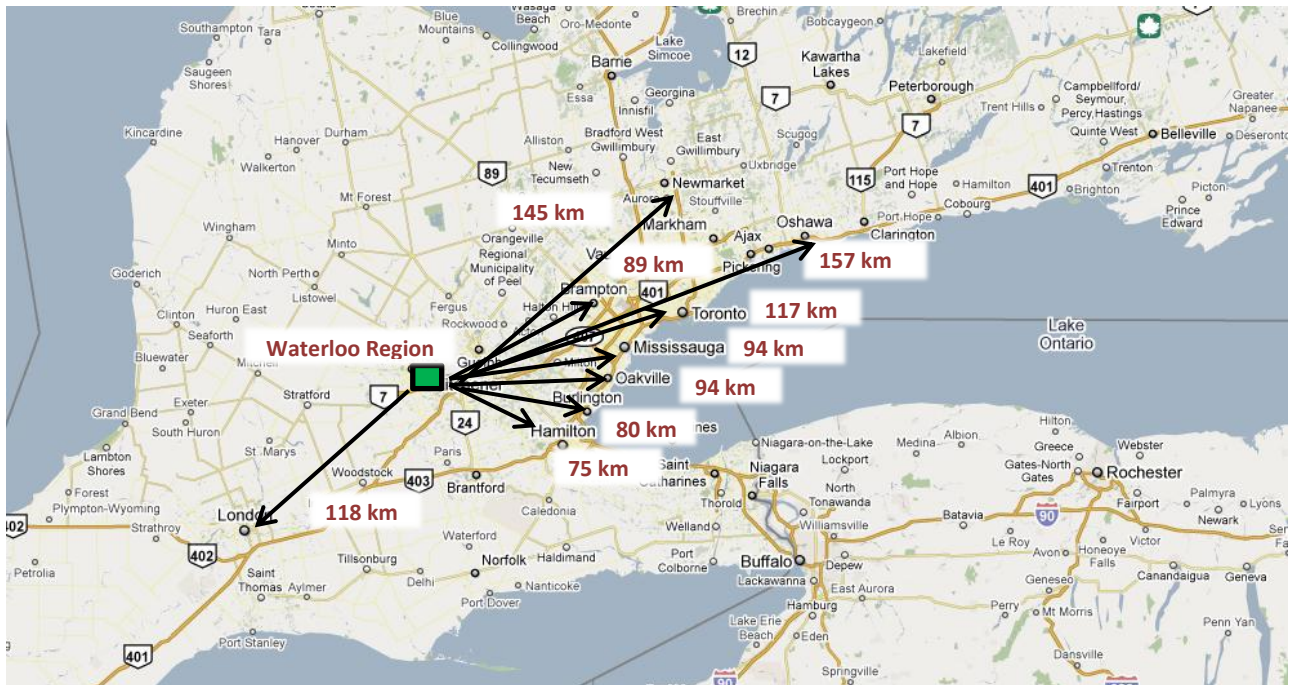


Figure 36: Distance from Waterloo Region to other urban centres

The gravity model would suggest that there is a lot of traffic flowing between Waterloo Region and the surrounding municipalities, and indeed there is a lot. In 2006, Waterloo residents made an average of 24,700 daily trips to the City of Toronto and Regions of Peel, Halton, York and Durham. These areas are represented by the cities on Figure 36. Only 1.8% of the trips were made by transit while the other 98.2% were by car. Between Waterloo and Guelph-Wellington, which is only 33 km away, 35,500 daily trips were made but 99% of them were by car due to limited transit service between the two municipalities. Between Waterloo and Hamilton-Niagara, 9,000 daily trips were made, with transit being the mode choice for 0.5% of them (Region of Waterloo⁶, 2010, p. 3-27).

To serve these commuters, a variety of intercity transit carriers operates multiple times a day from the cities of Waterloo, Kitchener and Cambridge. The RTMP outlines these services (Region of Waterloo⁶, 2010, p. 3-26). VIA Rail operates three trains per day between Kitchener and Toronto, London and connecting cities. The Greyhound bus operates 30 buses per day with stops in Waterloo, Kitchener and Cambridge, going to Toronto. Coach Canada offers eight buses per day between Kitchener/Cambridge and Hamilton. GO Transit is the most recent

provider to the region and now operates 19 buses to Mississauga and Toronto. GO trains will begin service in late 2011.

Waterloo's location also serves to attract provincial and federal funding. Waterloo falls within the jurisdiction of the *Places to Grow Act*, has become a technology hub and is a fast growing region close to the GTA – all attributes that have geographic location to thank, in part. Thus, the region's location helps target it as a senior government priority.

It is expected that the regional location factor will contribute small positive increases to GRT's ridership. The potential increase is large, but the 98%+ of driving commuters first need to be drawn out of their cars and onto the GRT and intercity networks.

Staff Awareness

Municipal staff recognize the need for improved transit service for commuters. They worked with operators like GO Transit to bring GO bus service into the region in 2009, and have negotiated with the agency to implement GO train service five days a week beginning by the end of 2011. The RTMP recommends, “the Region continue to work with the Province, Metrolinx, GO Transit and VIA Rail to pursue improved inter-regional transit connections to the Region” (Region of Waterloo⁶, 2010, p. 7-19). The Region has done just that. Regional staff are also working toward the creation of a major transit hub in downtown Kitchener. The hub is expected to bring together GRT, GO Transit, VIA Rail, Greyhound and Coach Canada in one station. This is an important step toward improving regional transportation into and out of Waterloo, and is made feasible by the geographic centrality among high traffic volume areas.

Councillors did not identify intercity travel as a transit system priority through the survey responses. Since it is important for Waterloo to have good connections with adjacent municipalities, councillors should be better aware of the opportunities that exist for GRT to capture more of the distance commuter market. However, since staff are very aware of these opportunities and are working to improve these connections, the staff awareness of this factor is appropriate.

Policies/Guidance

Despite frequent connections between the region and its surrounding municipalities, the RTMP reports, “the limited inter-regional transit service into Waterloo Region represents a transportation network deficiency that limits transportation choices and opportunities for many longer distance travelers to/from the Region. For those who have access to a vehicle, often this is the only mode of transportation that provides a reliable level of service throughout the day” (Region of Waterloo⁶, 2010, p. 3-27). Heavy demand on the regional transportation network demonstrates the frequent interaction between Waterloo and large urban centres in southwestern Ontario, so it is appropriate for the RTMP to recognize this missed opportunity.

However, the RTMP does not specifically mention improving integration with the Guelph-Wellington County transit system. Since the heaviest flows occur between Guelph and the region, policies and guidance materials should not overlook the geographical importance of this municipality. Overall, though, the guidance related to the regional location factor is appropriate.

Implementation of Initiatives











In 2009, the provincial and federal governments put \$2.5 million toward constructing four GO Transit bus stops in the region – a first for the area. GO Transit has also agreed to begin rail passenger service between the region and Toronto beginning in late 2011. Also, the RT budget has funding to plan for an inter-regional transit hub in downtown Kitchener. The hub would connect GRT, VIA Rail, GO Transit, Greyhound and Coach Canada systems. These initiatives help demonstrate the increasing importance of Waterloo within south-western Ontario, especially in relation to Toronto, Canada’s largest city.

Conclusion

Due to Waterloo Region’s advantageous geographic location within Ontario’s economic engine, there are large travel flows between the region and nearby municipalities. Approximately 69,200 trips were made between Waterloo and adjacent municipalities in 2006, 850 of which were taken by transit. If this number were higher, it could likely increase GRT ridership. Therefore, the region’s advantageous location is expected to contribute small positive increases to ridership in the future, as long as inter-regional connections are improved and integrated with the local transit system.

The Region understands the rider demands on intercity transit and the current inadequacy in serving those demands. Staff are committed through the RTMP to continue working with partners to improve transit connections with the GTA.

The RTMP places priority on providing adequate inter-city transit connections. It could be stronger on promoting the City of Guelph as an opportunity to link transit systems. Overall, the Region is putting forth the effort to improve intercity transit and take advantage of its regional connections. This should be a smaller priority for GRT in efforts to boost ridership.

REGIONAL LOCATION			
Municipality's Level of Response →	Staff Awareness	Policies/Guidance	Implementation
Impact of Factor on Transit Ridership ↓			
			
	WATERLOO - The region is centrally located among major municipalities; however, transit is minimally used between these areas, so the GRT ridership potential is expected to be small positive		
	 - Regional staff recognize the importance of improving intercity connections - Councillors should give more priority to factor	 - RTMP contains strong discussion on inter-regional transportation and strengthening links between local and external transit networks	 - Intercity transit service continues to improve, and more projects to boost intercity connections are planned
			
	KINGSTON - The isolated geographic location and lack of a substantial regional transportation network are expected to play no role in ridership growth opportunities from commuter markets		
	 - Intercity travel is a low priority for staff and councillors, which is appropriate	 - KTMP indicates need to coordinate with inter-city modes, such as train, bus and ferry	 - Projects such as improved intercity connections have been implemented, which is sufficient

4.4 Federal and Provincial Impacts

Literature

In the hierarchy of Canadian governance, the federal government is the foremost governing power, followed by provinces and then municipalities. All jurisdictions in Canada are governed by the *Constitution Act, 1867*. The *Constitution Act* provides certain powers to the federal government and to provincial governments. It also allows the provinces to create municipalities. The Ontario *Municipal Act, 2001*, which was originally enacted in 1849 and most recently amended in 2007, governs the way municipalities are formed and the powers that are granted to them by the Ontario government. Municipalities are granted autonomy and decision-making power over their own affairs, but they are also subject to changes by the province at any time. Because municipalities are creatures of the province and the provinces are mostly sovereign entities unto themselves, municipalities are a step removed from federal policies and influences. In fact, municipalities are limited in the interaction they have with the federal government – the province usually acts as intermediary. In the case of local infrastructure projects such as transit, the Canadian federal government is thus typically more of an indirect grant provider rather than a policy setter for municipalities.

Having said that, the federal government can influence some policy and infrastructure decisions in individual cities by setting out the criteria that a city's proposed project must meet in order to be granted federal funding. For example, the 2007 Building Canada Plan contains a Public Transit Fund, which invests in “projects designed to produce results in three areas of national importance: a growing economy; a clean environment; and strong and prosperous communities” (Infrastructure Canada, 2010). Under these three areas, specific project categories are identified as being the ones eligible for funding, such as short-sea shipping, tourism, public transit, disaster mitigation and recreation. In this way, the federal government influences what projects a municipality has to focus on if it wants to get funding. In 2006 and 2008 there was also a Public Transit Capital Trust – the federal government allocated money to each province, which decided on the distribution to projects, municipalities and transit agencies (CUTA³, 2009, p. 5).

Also part of the Building Canada Plan is the federal Gas Tax Fund (GTF). Every municipality in Canada receives a portion of the GTF based on a per capita formula. The gas tax fund is flowing \$4.4 billion to Ontario municipalities between 2007 and 2014, and \$2 billion was made available to municipalities in 2009/2010 (CUTA³, 2009, p. 5). Public transit is one of about six types of municipal infrastructure eligible for GTF spending. The GTF and Public Transit Fund have been the primary vehicles for delivering transit capital funding to municipalities. The federal government does not provide direct operating grants for transit.

The provincial government, compared to the federal government, is much more hands-on with policy initiatives that have a direct impact on municipalities. The Ontario *Planning Act, 1990* sets out the requisite elements and processes for land use planning in each municipality, such as creation and updating of official plans and prescribed public consultation.

The province develops a Provincial Policy Statement (PPS) under the *Planning Act*, which provides the framework for land use planning and development and with which every municipal OP must comply. The current PPS (2005) promotes development in existing settlement areas; using resources and infrastructure efficiently; mixing land uses for housing, working, shopping and recreation; and supporting sustainable transportation such as walking and transit (MMAH, 2005, pp. 9, 12 & 14).

The Places to Grow: Growth Plan for the Greater Golden Horseshoe is a significant planning framework that has implications for the municipalities in the Greater Golden Horseshoe (GGH) (Figure 37). The P2G identifies urban growth centres and sets targets for intensification that the municipalities must meet over the next 25 years. Local OPs must conform to the P2G and monitoring measures will be put in place to measure the plan's implementation.

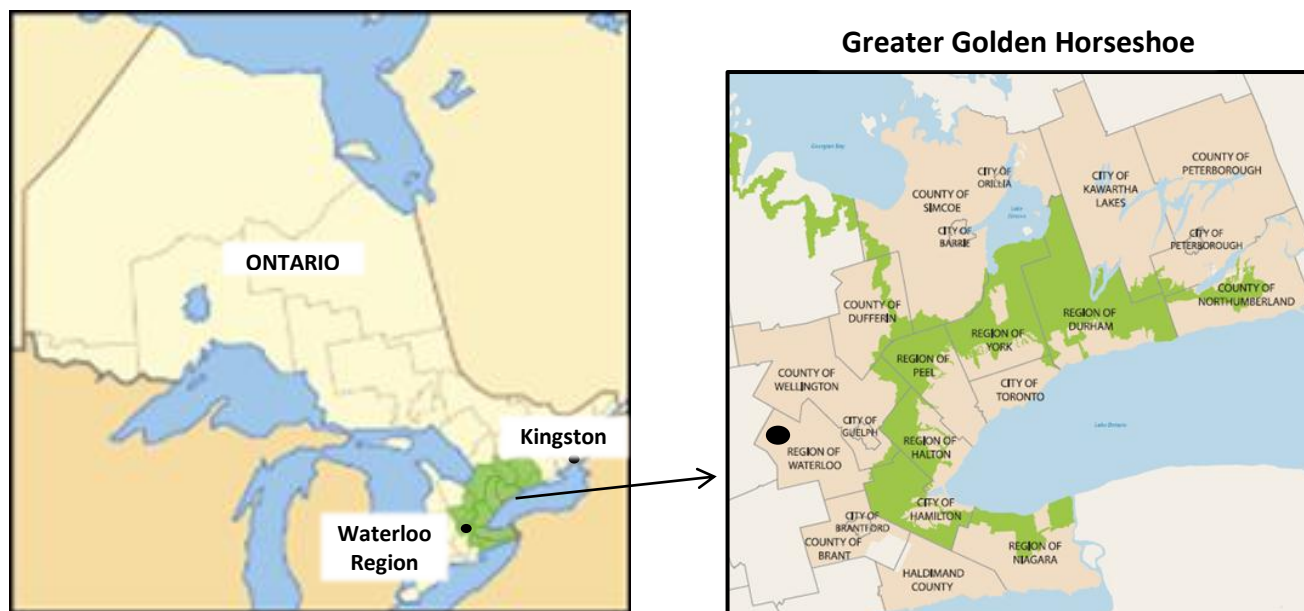


Figure 37: Map of Greater Golden Horseshoe in 2006 Places to Grow Plan

To support the goals of P2G, ReNew Ontario, a five-year investment plan, was developed. ReNew Ontario invests \$7.5 billion in infrastructure in the GGH area. Added to this is \$11.5 billion through MoveOntario 2020 for implementing a Regional Transportation Plan in the Greater Toronto and Hamilton Area (CUTA³, 2009, p. 19).

In addition to the funding programs ReNew Ontario and Move Ontario, the provincial government provides municipal funding through other programs. Special programs are developed from time to time, either by the province alone or with the federal government, to provide one-time grants to municipalities for infrastructure funding. Typically, this funding is awarded on a competitive basis. Examples include the Canada-Ontario Municipal Rural Infrastructure Fund and the 2008 Municipal Infrastructure Investment Initiative.

Another important transfer payment that helps fund transit projects in cities is gas tax revenues. Since 2004, a portion of provincial gas tax revenues has been redistributed to each municipality through the Ontario Municipal Partnership Fund commensurate to the municipality, based on municipal population and transit ridership. This revenue is a significant source of money for municipalities to administer local programs and undertake capital projects.

A program to aid in the purchase of transit vehicles is called the Transit Procurement Initiative (TPI), led by the Ontario Ministry of Transportation and Metrolinx. The TPI is a joint transit bus procurement program that helps municipalities combine (and therefore reduce) the administrative costs of buying new buses through bulk purchases. The program began in 2006 and is free to join by all Ontario municipal transit agencies. The full operating and capital expenses of transit vehicles, though, are the full responsibility of municipalities.

Federal and provincial funding for transit is critical to help municipal transit systems operate, and particularly expand in order to increase mobility in urban areas (CUTA³, 2009, p. 1). Figure 38 shows the substantial increase in upper government funding of transit capital projects between 2001 and 2007. For transit operations, provincial contributions comprise a relatively small portion.

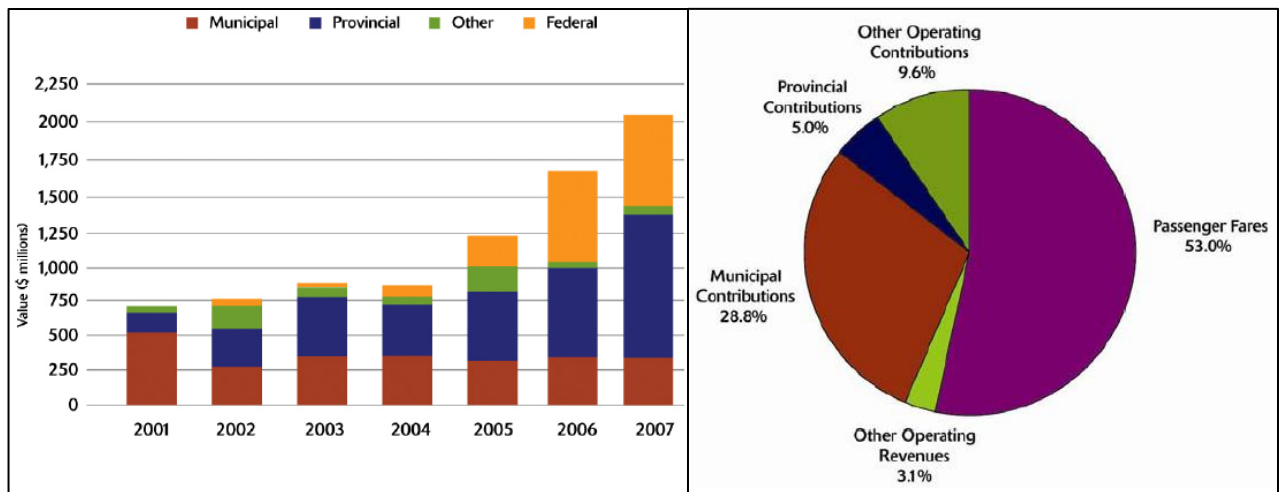


Figure 38: Sources of transit capital and operating investment in Canada, 2001-2007. Source: CUTA³, 2009, p. 1

There is a tendency for the federal and provincial governments to focus their policies and funding on larger rather than mid-sized municipalities. Bunting et al. (2007, pp. 46-47) explain that serious problems often have their origin in larger areas. In addition, it may be more politically advantageous for a senior government to fix a problem in a place that has many residents (potential voters) and greater public visibility. For example, the MoveOntario 2020 funding is for large municipalities in the Greater Toronto Area and for Hamilton. Previous major transit investments made by the federal government include grants between \$83 million

and \$450 million for large municipalities such as Vancouver, Toronto, Mississauga, Brampton and York Region (CUTA³, 2009, p. 6).

To summarize, the province and federal government provide support for local transit infrastructure through short-term, project-by-project funding programs and through gas tax revenues. The programs are usually awarded on a competitive basis, though there may often be a bias toward larger municipalities. Both levels of government return a portion of gas tax revenues to municipalities based on population size and transit ridership. Federally, this money must go towards eligible project types, one of which is transit. Provincially, the money must go toward transit infrastructure. Aside from funding, the province is more involved in setting transportation policies than is the federal government. The province has a greater influence on local transit.

Kingston

Current Conditions

Kingston is not a significant beneficiary of upper-tier government funding for transit infrastructure. From the federal government, the city has received small sums of money for its transit system over the past decade. In 2005, the government funded the One-Tonne Challenge that encouraged municipalities to lower their greenhouse gas emissions. Kingston was one of 41 municipalities in Canada to receive funding for a pilot One-Tonne Challenge program, and received \$110,000. Some of this money went toward installing bike racks on three city buses and giving away 10 one-month bus passes (City of Kingston¹⁰, 2005; City of Kingston¹¹, 2006). The One-Tonne Challenge was cancelled in 2006.

Through the federal government's primary funding vehicle, the 2007 Building Canada Plan, six infrastructure projects have been funded in Kingston for a total of about \$26.1 million in project-specific funding. The projects, listed on Infrastructure Canada's website, are for water supply, sanitary sewers, arts and community services; none are transit-related.

The city also receives yearly its allocation of federal gas tax revenues. In Kingston's 2011 Capital Budget, the federal gas tax reserve fund was allocated among projects for a total of \$29,625,852, of which 3.4% was allocated to transit projects.

Provincial funding for transit has also been minimal. In 2002, the Ontario government provided \$275,000 (one-third of costs) toward expanding the KT fleet. Funding was provided through a 10-year Transit Investment Partnerships initiative. In 2010, the city received \$20,000 under Ontario's Transportation Demand Management Municipal Grant Program to develop a Transportation Demand Management (TDM) Strategy (Gerretsen, 2010). The plan will outline strategies and partnership opportunities to promote transit, cycling and walking. The funding is a very small amount and does not provide for implementation.

The city also receives provincial gas tax revenues. In the 2008/2009 fiscal year, the province allocated \$2,026,499 to Kingston. In the 2009/2010 capital budget, provincial grants of \$8,227,400 were allocated to eight projects, none of which were transit-related. The city's 2011 capital budget does not include any financing from the province.

Kingston is not within the P2G jurisdiction, therefore, it does not qualify for funding investments for GGH communities. If Kingston were in the GGH, perhaps its transit network redesign project would be considered for provincial funding in support of P2G implementation.

Based on this history of minimal funding for transit, but the growing importance of gas tax revenues earmarked for transit projects, it is expected that the federal and provincial impacts factor will have small but positive impacts on the city's transit ridership.

Staff Awareness

The interview results find that "provincial and/or federal impacts" received a score of 5 out of 6, the lowest rated among the provided list, as a reason why the Kingston transit network redesign project was undertaken (Figure 4242). "I don't think it has been a factor in what we're doing to undertake the redesign project. Only in that we would look at some funding or some other pieces there," says interview respondent K2. K3 agrees that the provincial and federal policies factor is "way down on the list."

Sheila Kidd, Director of Corporate Asset Operations in the City of Kingston, says, “the gas tax program is helping us maintain and expand Kingston Transit” by funding such service improvements as new routes, a next stop announcement system, and the purchase of new fleet (Government of Ontario¹, 2010). This money is obviously important for Kingston, but all municipalities receive this funding automatically, so it is not critical for Kingston to ensure that its policies and programs align with provincial interests.

It appears that the opportunities for working with senior governments are not on councillors’ radar. Councillors do not make any comments concerning the federal or provincial government, either as a policy setter or funding partner. They also do not mention the recent reallocation of gas tax revenues to the city for its transit projects, which has started to play an important role in Kingston. The City is not proactive in engaging with provincial and federal partners regarding transit funding. The 2005 Business Plan reports that local politicians had not invited provincial MPPs and federal MPs to Kingston Transit, even though “the more local politicians understand transit issues, the more likely they are to support transit” (City of Kingston², 2005, p. 48). If councillors were more involved in lobbying or consulting the province and federal government, they would strengthen these relationships for Kingston and attract more funding. The level of awareness of councillors is not as high as it needs to be due to the capital investments that will be required to achieve greater transit modal share.

Policies/Guidance

The KTMP provides guidance on federal and provincial funding support. In order to help finance the initiatives of the KTMP, including road and transit capital projects, and reduce the burden on property taxes, “new and innovative funding sources need to be pursued.” For this the City requires federal support (infrastructure funds) and provincial support or legislative changes (fuel tax, tolls, vehicle registration fees) (City of Kingston¹, 2004, p. 69). Public-private partnerships are mentioned as an avenue to achieve greater governmental cooperation.

This guidance in the KTMP is appropriate since the City has an ambitious goal of increasing the transit modal share to 11%. Significant transit improvement projects will be required to meet the goal. The federal and provincial governments have been awarding substantial amounts of

competitively acquired grants for municipal infrastructure over the last decade. The KTMP is appropriately drawing attention to the need to act on these opportunities.

Implementation of Initiatives

The City has appropriately allocated federal and provincial funding to transit projects, and has been responsive to changes in senior government policy affecting transit. The 2005 KT 5-year Business Plan mapped the provincial gas tax revenues for the 5-year life of the plan. The Business Plan indicates that this funding made possible a more aggressive expansion program for Kingston Transit services, such as fleet replacement (City of Kingston², 2005, p. 13). The City has also participated in the province's TPI, allowing some unit cost savings in the purchase of new buses. Four buses were purchased in 2010 and additional purchases are planned for 2011, 2012 and 2013.

The City has used the federal government's One-Tonne Challenge funding for bus bike racks and transit pass giveaways. Also, the TDM Strategy that was funded by the provincial government has been completed.

The city's 2011 capital budget includes \$1,000,052 in federal gas tax funds to replace full size buses. In 2009 and 2010, the capital budget included \$990,000 in federal gas tax funding for a park and ride, transit technology and engineering work. Prior to 2009, the capital budgets indicate no federal funding to transit or any other project.

Apart from allocating funding grants to projects, Kingston staff have complied with changes in provincial policy that affect the transit system. For instance, the City proactively responded to changes in bus accessibility requirements under the *Accessibility for Ontarians with Disabilities Act*. Kingston's fleet is now fully accessible on many routes.

Hence, the implementation of initiatives that have been federally or provincially funded, and the responsiveness to changes in provincial policies, demonstrates an appropriate response to this factor in terms of implementation.

Conclusion

Kingston has not been a major recipient of federal or provincial funding for transit. Recently, gas tax revenues have provided an important revenue source, which will help transit staff improve the system over the long term. Kingston is outside of an important policy area, Ontario's P2G jurisdiction. Therefore, this factor is expected to be small but positive on transit ridership.

Kingston staff and councillors have not maximized the opportunity to engage upper tier government partners in transit improvement projects. Transit staff believe that these governments have a low impact on the network redesign initiative, so staff may not be motivated to try to attract government investments. There is likely more partnership building that could be done in order to encourage upper tier funding for Kingston's transit projects.

The KTMP draws attention to the need to seek out federal and provincial funding to help with the implementation of the master plan. This is appropriate because, while this factor has played a less influential role on the city's transit ridership in the past, it will become more important in the future if the City wants to meet its transit modal share goal.

While Kingston has not received a lot of senior government transit funding, it has received and utilized small amounts for the city's transportation demand management strategy and installing bicycle racks on buses. Based on this record, senior governments can have confidence that Kingston will appropriately allocate any future funding for its transit system.

Waterloo

Current Conditions

Waterloo, unlike Kingston, is a significant beneficiary of upper-tier government funding for transit. Regarding the federal government, there have been a total of 37 projects allocated to the three cities within Waterloo Region. One of these is for the regional rapid transit project – worth \$265 million, or 77% of the total funding allocated for all 37 projects.

Prior to the federal commitment for the region's RT project, in 2001 the government awarded the Region with \$9.25 million to implement its iXpress service. This service has proven extremely successful – it increased ridership consistently over its four-year period, and up to 19% of GRT riders had shifted from travelling by car to travelling by iXpress (Transport Canada, 2010).

The region receives annual federal gas tax revenues. In the 2010 budget, the region's transportation and environmental services department received \$14,248,727 in funding. In 2011, this was increased by 2.9% to \$14,666,362.

From the provincial side, Waterloo, unlike Kingston, is designated as a Place to Grow. Thus the region qualifies for related funding opportunities. In fact, the Ontario government views the region as a strategic location in which to make investments, to help verify the success of the P2G policies. Most notably, the province has committed \$300 million toward the Region's rapid transit project. This money, combined with the federal contribution, is going toward the largest transit project in the region's history.

Aside from the \$300 million provincial funding for RT, Ontario has provided Waterloo with other transit funding since 2003, to a total of \$72 million. Money has been provided for the purchase of buses, construction of bus and passenger facilities, transit technologies, gas tax funding, vehicle renewal, and an environmental assessment for RT (Government of Ontario², 2010). Waterloo also received \$8,756,641 in provincial gas tax revenues. GRT received approximately \$9.2 million in provincial subsidies in the 2010 and 2011 capital budgets.

On the policy side, Waterloo is required by the P2G to intensify its downtown areas to have 150-200 people + jobs per hectare by 2031. This land use policy will have a positive impact on city form. It will make the region's urban areas more transit-friendly, since a denser area helps transit service run more efficiently. In turn, ridership is expected to increase.

High funding levels from the federal and provincial governments combined with provincial P2G policies have contributed, and will likely continue to contribute, to strong ridership increases.

Staff Awareness

Interview respondents give “provincial and/or federal impacts” a ranking of 3.25 out of 6 for the reasons why the rapid transit project was undertaken (Figure 43). Comments from respondents include: “Places to Grow really helped us to argue that [transit] fit in quite well,” and staff had “another rationale that [we] could use to sell the [rapid transit] project per se” (W1). Respondent W3 said that while the rapid transit project is very expensive, it cannot be delivered on regional property tax alone and the fact that “there’s going to be significant dollars invested by the province and the feds is probably the biggest motivator.”

Respondent W1 noted, interestingly, that by foreseeing the municipal amalgamations that the province was doing in the late 1990s, the Region looked ahead, saw its name on the list (so to speak), and decided to amalgamate on their own. Thus as the Region’s two transit systems were amalgamated in 2000, this allowed transit service to become more streamlined and service improved across the region. And, despite extra costs that may have resulted from the amalgamation, ridership that was falling in the 1990s has risen year over year since 2000. Regional staff therefore have been aware of the historical changes that were driven by the province and how they impacted ridership.

Councillors recognize the important roles that senior governments play in the region’s transit system, particularly as funders for the RT project. Both staff and councillors have worked closely with their federal and provincial counterparts to obtain the funding commitments of \$265 million and \$300 million, respectively, for RT. There is a high awareness among staff regarding the importance that senior governments play in assisting GRT operations and projects.

Policies/Guidance

In the GRT 2001-2005 Business Plan, external factors were identified in terms of having an effect on the region’s transit ridership over the next five years. One of these factors was the prospect for senior government funding. The Business Plan recognized that the chance to attract government funding was higher in the early 2000s than it had been in the past, and that the gas tax funding is an important component of that. The region recognized then, as it does now (evidenced by the initiative it took to win funding for the UTSP), that “the benefits provided by urban transit make a compelling case for senior level transit funding” (Region of Waterloo¹⁰,

2001, p. 34). Furthermore, the RTMP identifies senior governments as important factors in the transit system and ridership.

The ROP's transit policies comply with intensification and transit-supportive directives set by the P2G policies. The region, therefore, has appropriate policies and guidance regarding potential impacts of the federal and provincial governments on ridership.

Implementation of Initiatives

The Region has allocated government dollars to projects that have substantially increased ridership. As previously mentioned, the federal grant of \$9.25 million was used for the UTSP and iXpress service. GRT has used provincial money for various transit infrastructure improvements and project planning.

The \$565 million in rapid transit funding has not been implemented yet. Further project planning and an environmental assessment must be completed, after which time the start of construction will be determined.







The implementation of senior government funding and policy alignment for the region's transit projects have been appropriate and highly beneficial.

Conclusion

There have been significant funds that the federal and provincial governments have given to Waterloo Region's transit system in the past 10 years. This has allowed the region to implement major transit improvement projects, such as the iXpress service, that have resulted in very high ridership increases. The province and federal government are also providing the largest single investment in the region's transit system, to be used toward the RT project. Therefore, senior government input, whether through funding or policy, is expected to have a very positive impact on Waterloo's ridership in the foreseeable future.

Regional staff and councillors have demonstrated their understanding of the importance of senior government funding opportunities, both in the past and for the current RT project.

Guidance materials regarding senior government engagement have been appropriate. They have helped draw attention to the need to work with government partners, especially if the Region wants to introduce higher order rail or rapid bus transit.

FEDERAL AND PROVINCIAL IMPACTS			
Municipality's Level of Response →	Staff Awareness	Policies/Guidance	Implementation
Impact of Factor on Transit Ridership ↓			
+	WATERLOO - High funding levels from senior governments combined with provincial P2G policies have contributed, and will continue to contribute, to high ridership increases		
	 <ul style="list-style-type: none"> - Regional staff and councillors engage senior governments in seeking transit funding and negotiating policy 	 <ul style="list-style-type: none"> - RTMP and Business Plan identify senior governments as important transit factors - ROP's transit policies comply with provincial policies 	 <ul style="list-style-type: none"> - Federal and provincial subsidies have allowed for implementation of important transit projects - Not yet budgeted are funding commitments for the RT project
+	KINGSTON - The provincial and federal gas tax revenues will likely contribute in a minor way to Kingston's ability to attract riders		
	 <ul style="list-style-type: none"> - Staff and councillors give low priority to upper tier government involvement in transit system - Opportunities to attract external funding may be missed 	 <ul style="list-style-type: none"> - KTMP identifies a significant capital funding gap for infrastructure and thus the need to seek federal and provincial assistance 	 <ul style="list-style-type: none"> - Senior government funding has been used for transit projects

4.5 Fuel Prices

Literature

Since the 1970s, and particularly since 2000, the price of gasoline has increased substantially, as seen in Figure 39. The first chart in the figure shows the Canadian inflation-adjusted gas prices between 1968 and 2006 – to show historical prices – and the second chart shows the Canadian average prices between 2007 and 2011 – to show recent prices. Between 1970 and 1980, the price ranged from 55¢/litre to 61¢/litre. In the 1980s, the price range increased moderately to between 59¢/litre and 87¢/litre. In the 1990s, the price range decreased slightly to 65-73¢/litre. However, in the first decade of the 2000s, the cost of fuel increased from a low of 66¢/litre in 2000 to a high of 147¢/litre in 2008. In the first half of 2011 the price has remained between 100-130¢/litre. Appendix 6 provides further discussion on reasons for gas price increases.

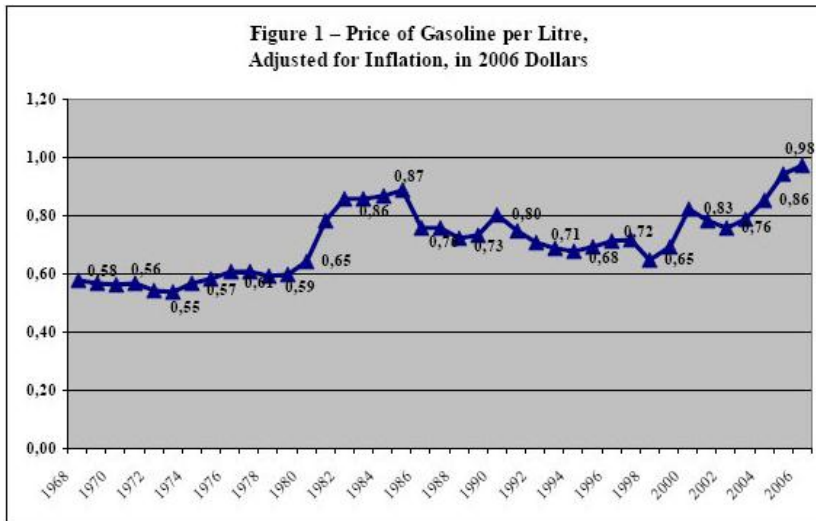
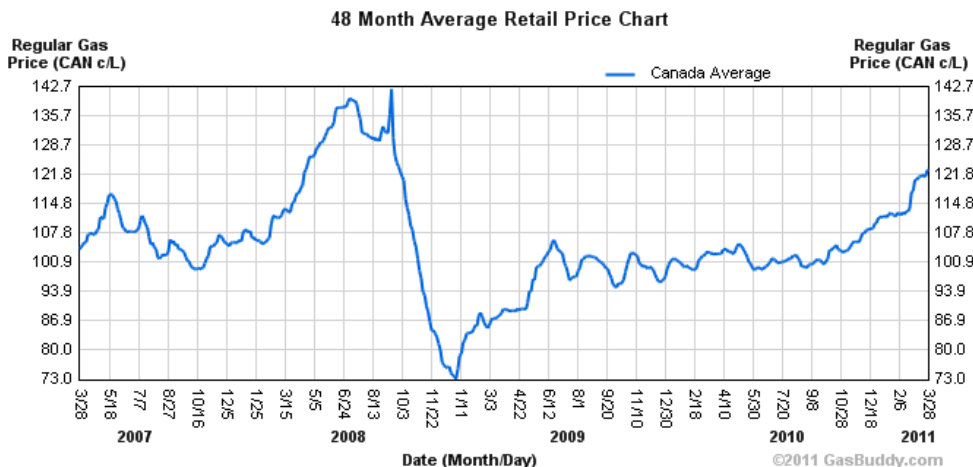


Figure 39: Inflation-adjusted average gasoline prices in Canada 1968-2006 and average gasoline prices in Canada 2007-2011.

Sources:
<http://www2.parl.gc.ca/Content/LOP/ResearchPublications/prb0755-e.htm> and
http://gasbuddy.com/gb_retail_price_chart.aspx



Gas prices in Waterloo Region and Kingston are, on average, slightly lower than the Canada average, based on data found on gasbuddy.com. For example, on March 28, 2011, the Canadian average was 123¢/litre, the Waterloo average was \$122.7¢/litre and the Kingston average was 120.1¢/litre. The long term price trends in each area follow the same pattern, with prices for Waterloo and Kingston consistently slightly below the Canada average.

At the same time that gas prices increased from 66¢/litre in 2000 to 147¢/litre in 2008, driving habits and vehicle ownership rates did not decrease in step.

Figure 40 shows that kilometres traveled in Ontario increased from about 106,000 km in 2000 to 116,000 in 2009. Vehicle ownership remained relatively constant, ranging between 490,000 vehicles owned in 2000 to 550,000 in 2008, but there was a decrease to about 340,000 vehicles in 2009, possibly as a symptom of the 2008 global recession.

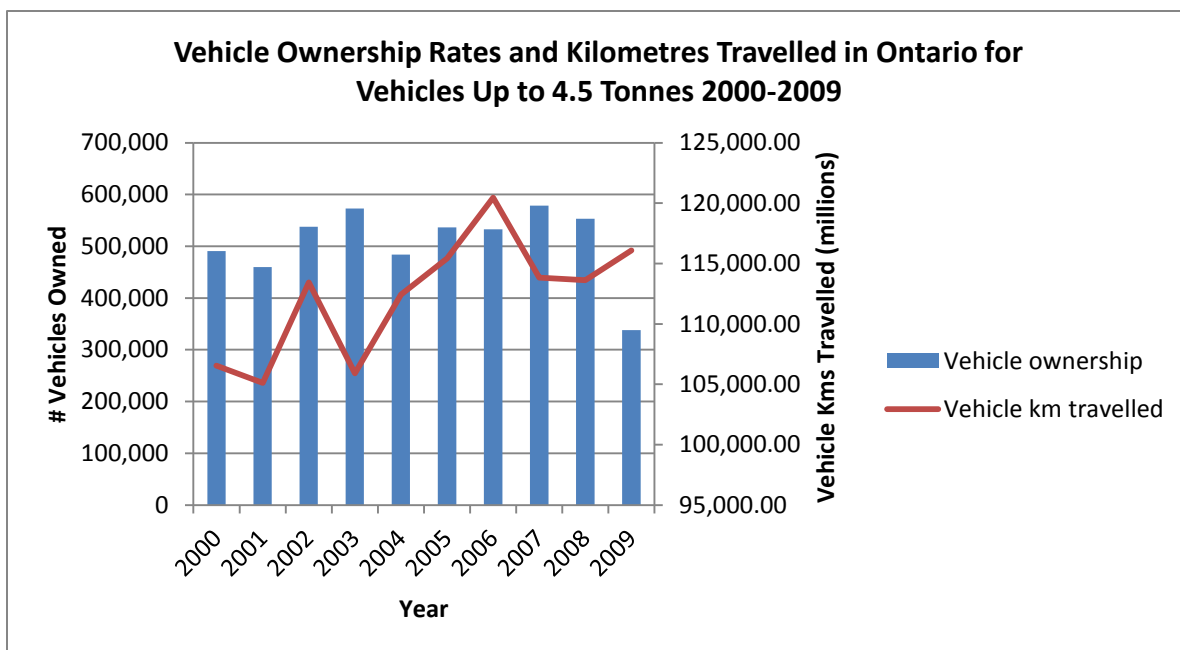


Figure 40: Vehicle ownership rates and kilometres travelled in Ontario 2000-2009. Statistical source: <http://dsp-psd.pwgsc.gc.ca/Collection/Statcan/53-223-X/53-223-XIE.html>

It appears from

Figure 40 that the rise in fuel prices over the previous decade has not caused Ontario drivers to abandon their cars. Looking forward, the question is whether a continued rise in fuel prices has the potential to decrease car use and, by association, increase transit ridership.

Some literature has been written about this relationship. Two studies find that fuel prices have a small positive influence on ridership. Two reasons are offered: fuel comprises a relatively small proportion of the overall cost to own and operate a vehicle (Oldread, 2011, p. 12), and there is relatively low variation in average fuel prices (Taylor et al., 2008, p. 9). Another study (Haire & Machemehl, 2010, pp. 21 & 24) finds that there is a definite relationship between ridership and gas price, and that the relationship varies by mode and municipal size. In terms of mode, fuel prices have the biggest effect on commuter rail systems, followed by heavy rail and then conventional bus. In terms of size, in medium-sized cities residents often have less flexibility in switching from the automobile as their main travel mode.

The relationship of fuel prices to municipal size is important within the context of this thesis. The Haire and Machemehl study reports that the larger the municipality, the more sensitive motorists are to changes in gas price; in other words, the more likely that these motorists would switch to transit, compared to drivers in medium or small municipalities. Drivers in small municipalities are less sensitive, or less “elastic” in economic terms, to gas prices. Therefore these drivers may not as readily switch their primary travel mode. This could be because there are no close alternatives to driving, such as a high performance transit system that offers fast travel times, convenient stop locations, high frequencies, comfortable trips, etc.

The lower elasticity to rising gas prices in smaller municipalities could also be due to the relative ease of getting around the city by car compared to driving in larger municipalities. On more congested roads, the opportunity cost of driving through heavy traffic increases more steeply as gas prices increase, compared to taking a bus through heavy traffic. Drivers are paying more in gas for each delay in travel time. On a local bus, however, the passenger pays a flat rate for the trip no matter how long the travel time is. Congested roads combined with high gas prices, as is more typical in larger municipalities, therefore may induce a more serious consideration of taking transit.

In summary, the literature shows that there is a minor relationship between fuel prices and transit ridership. Ridership increases slightly when fuel prices increase. On the other hand, Ontario data shows that vehicle kilometres travelled and vehicle ownership rates have not

decreased to any degree as fuel prices have increased. The potential change in transit ridership may be closely related to other factors in combination with fuel prices, such as the municipality's size and the quality of transit service provided in the municipality.

Kingston

Current Conditions

As mentioned in the Literature section, Kingston's gas prices are typically lower than the Ontario and Canada averages. The literature suggests that commuters do not use gas prices as a major factor in their travel mode decisions, and that is what Kingston staff have observed as well. Staff indicate that the most significant spike in gas prices in recent years, that of 2008 when the price reached about \$1.30/litre, had little impact on transit ridership. There was an increase in ridership between 2007 and 2008 – it increased 7.7% from 2006 to 2007 and 6.3% from 2007 to 2008, whereas the average increase between 2003 and 2006 was 3.7%. However, these increases are likely better attributed to service increases than fuel costs, according to Kingston interview respondents.

What further dampens the impact of high fuel prices on encouraging a mode switch to transit is the relatively short commute time from the mainly residential west end to the downtown core. This commute is about 40 minutes for a round trip from home to work and back, whereas the Toronto average is 80 minutes round trip (interview respondent K2; Toronto Board of Trade, 2010, p. 43). A planning professor from Queen's University agrees, saying he "doubts the rising cost of gasoline has much impact on whether people choose public transit" since the marginal cost of driving is still relatively cheap. Kingston is "going to have to have a much higher gasoline price before people start to leave the car at home and take the bus" (Armstrong, 2008).

Based on this information, fuel prices are not expected to have much impact on the city's transit ridership in the near future.

Staff Awareness

Regarding the observed increase in ridership in 2007 and 2008, City staff say, "I don't think we can attribute much of it to gas prices so much as we are able to attribute it to services that were

being provided specific to students.” A new service for students plus an increase in service hours were the likely causes (interview respondents K1 and K2). Respondents also believe that gas prices are just one of many factors influencing driving behaviour. See Table 6 for the interview responses to question 14, which asked: “When the fuel price increased to over \$1/litre in the past few years, did the transit agency see an increase in ridership? If so, has this increase been sustained?”

Table 6: Summary of Kingston interview responses re: gas prices and ridership

K1	K2	K3	K4
<ul style="list-style-type: none"> - Unsure if ridership increased - People consider entire package of costs and benefits re: driving or using other modes - People accustomed to high gas prices, but much higher prices may deter driving - Past 3-4 years of Kingston ridership increases likely due to extended service hours 	<ul style="list-style-type: none"> - Yes, ridership increased, but not really attributable to gas prices - Services KT provided (e.g. on route 18) are likely cause - Commute distance in city short enough that gas prices not that important 	<ul style="list-style-type: none"> - Unsure if prices caused ridership increases; no obvious statistics correlating the two - Gas prices are one of many factors people consider when buying/using a car - Gas prices alone are not enough to encourage transit use 	<ul style="list-style-type: none"> - Yes, we saw ridership increases and think gas prices are one of the factors - There has not been a big enough drop in prices to be able to see clearly a correlation - Other costs of car ownership are important too

Three out of four councillors do not provide any comments on gas prices, while councillor KC1 provides a brief comment. When asked why the transit network redesign project was undertaken, one of the reasons given was that “peak oil may result in need for great transit service,” so it is important to “start building [the improved network] now.” This comment does not specifically relate current prices to the city’s ridership, but it does portray an awareness of the possible relationship between rising gas prices and transit. Since gas prices do not seem to be impacting ridership to a great extent in the city, it is appropriate for this factor to be absent from councillors’ minds when asked about transit. Perhaps this will change in the future.

Policies/Guidance

The KTMP does not provide any guidance on gas price trends, how they may affect transit ridership or operations, or what staff should do to plan for impacts. This is appropriate for the time being since this factor is not influential now. However, it may be helpful for an updated KTMP to include a brief analysis of fuel costs.

Implementation of Initiatives

There are no policies related to gas prices and no strategies related to this factor in the KTMP or in staff documents. Similar to the recommendation for the next KTMP to include a section on fuel costs, perhaps a survey of residents or data analysis related to fuel costs and transit ridership would help provide more information on this factor. However, the lack of initiatives regarding fuel prices is appropriate due to the expected negligible impact on ridership.

Conclusion

Fuel prices should not influence ridership one way or the other in the short term. A small increase in ridership was observed, but that was likely due to service improvements. The literature and Kingston staff agree that prices are not yet high enough to push people out of cars.

Kingston Transit staff have monitored the effect of gas prices on ridership. It appears that staff have an appropriate level of understanding of the fuel price-transit relationship in the city.

The KTMP does not include guidance on gas price impacts, which is appropriate for now since fuel costs seem to still be low enough not to discourage driving en masse. The next iteration of the KTMP, however, should probably mention potential impacts of ever-increasing fuel costs. Similarly, there have not been specific initiatives in relation to this factor. A survey of residents or more data analysis would be helpful.

Waterloo

Current Conditions

Waterloo typically has lower gas prices than the Ontario and Canada averages, but not much lower. In Waterloo, the 2008 spike in gas price had a drastic impact on ridership. Toward the end of summer, ridership increased 9-10% according to GRT staff; by comparison, the average increase between 2003 and 2006 was 6.7%. However, the increase lasted only a month before gas prices fell again. This large drop in gas price can be seen in Figure 39 at the date 10/3/08. By then, it was September and the higher ridership level that originated from gas price increases was sustained due to fall term student arrivals.

In the final report that was written in 2009 about the successes and challenges of the implementation of the UTSP iXpress project, a survey was conducted on the reasons why riders – who had previously used another mode to make the same trip – made a modal shift to the iXpress service. Among car drivers, 32% said the cost of gas was a reason; drivers also responded with other reasons for switching modes, as seen in Figure 41 (Region of Waterloo⁷, 2009, p. 50). This survey was conducted in 2007, which was a time when gas prices began staying at or above the 100¢/litre mark, but it was prior to the major price hikes that occurred in 2008.

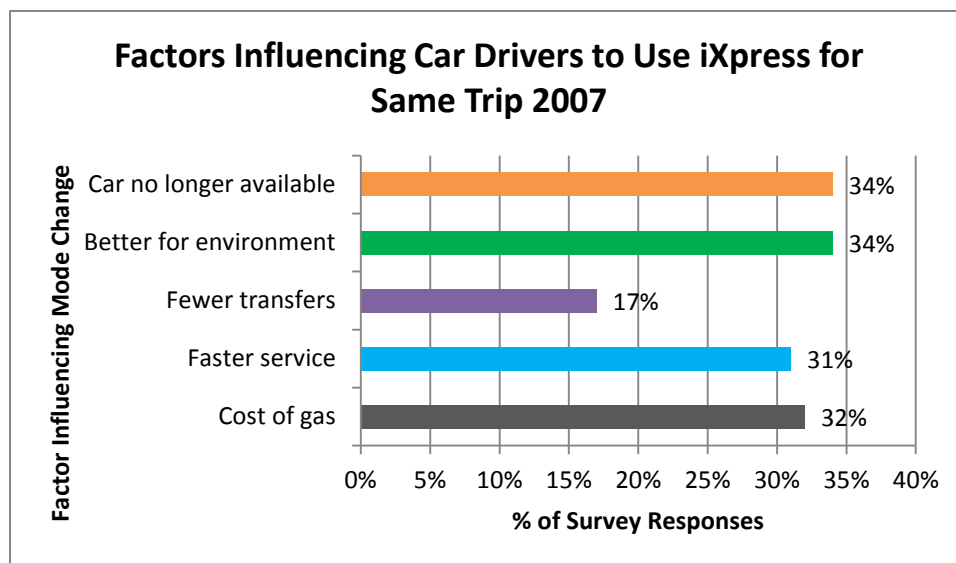


Figure 41: Factors influencing car drivers to use GRT's iXpress service for the same trip. Statistical source: Region of Waterloo⁷, 2009, p. 50

Gas prices contributed a large increase in ridership in 2008, but the increase was not sustained. Only one-third of survey respondents who switched to the iXpress bus route from cars indicate gas prices as a major factor in switching to the bus. Therefore, this factor is expected to have a small positive impact on GRT's ridership in the future. If prices spike significantly and stay high, this could become a large positive impact.

Staff Awareness

Staff have closely monitored ridership changes in regard to gas price fluctuations. They reported the changes in ridership and were able to correlate this to the summer months of 2008 when gas prices spiked and then dropped. See Table 7 for the interview responses to the question of fuel prices and GRT's ridership in 2008.

Table 7: Summary of Waterloo interview responses re: gas prices and ridership

W1	W2	W3	W4
<ul style="list-style-type: none"> - Yes, ridership spiked in response to gas price hike - Spike would have been larger and more sustained if gas prices remained as high and the recession had not hit 	<ul style="list-style-type: none"> - Yes, there was a drastic spike when prices increased in fall 2008 - More discretionary riders (commuters) were using transit, which is the group we want to get on transit - When fuel prices decreased again, these people went back to their cars – this was a missed opportunity for GRT 	<ul style="list-style-type: none"> - Yes, ridership went up in September 2008 - In October, November and December, the ridership dropped considerably as gas prices declined 	<ul style="list-style-type: none"> - Yes, there was a huge increase in ridership (9-10%) - Ridership fell a bit when prices went back down, but the annual September influx of students sustained some of the increase - Prices have to get much higher (maybe \$2/litre) in order to affect ridership in the long term

The ridership increase resulting from more expensive gas was beneficial from two standpoints: choice riders, who often demand higher performance in a transit service, were using the system, and people who had never tried transit before were getting on board. This may then lead to

permanent mode changes among some of these new riders. However, GRT staff found that, once gas prices returned to lower levels, that ridership boost was not sustained. Interview respondent W2 called this a “missed opportunity.” These people tried transit, were unsatisfied, and went right back to driving.

Councillors do not portray an awareness of the relationship between transit and gas prices in their survey responses. However, since staff are monitoring these trends, it is not concerning if councillors are not also monitoring the data. Staff have an appropriate awareness of these trends.

Policies/Guidance

The RTMP does not provide any guidance on how to manage this factor. While price hikes had a measurable impact on ridership, this factor is considered a lower priority for transit planners. The literature does not report that this factor consistently has a large impact on transit ridership and it is expected that the price per litre needs to be much higher in order to affect more directly ridership. Therefore, the lack of specifics in the RTMP is appropriate.

Implementation of Initiatives

There are no programs to implement regarding transit and fuel prices. This is appropriate, since it appears that continual monitoring of trends by transit staff is all that is required to manage this factor for the time being.

Conclusion

The interview data and the results in Table 7 suggest that the high cost of gas has some influence on transit ridership. The 9-10% increase GRT experienced in 2008 shows that the influence can be significant. However, the return to normal ridership levels and lower ridership increases (the increase from 2008 to 2009 was 5%) indicate that gas prices do not contribute to sustained ridership growth. Perhaps drivers have now adjusted to the persistently 100+¢/litre prices, and it will take a much higher price of gas combined with a vastly improved level of transit system performance to draw drivers into buses. Respondent W4 thinks that prices need to get much higher – maybe 200¢/litre – to effect that kind of modal shift. Therefore, fuel prices have a small positive influence on ridership.

GRT staff have been able to monitor and assess ridership changes during peaking periods of gas prices. They were not able to retain new drivers-turned-riders in 2008, but they recognize that this is an opportunity to seize as gas prices continue to rise. Therefore, regional staff have a good level of understanding of this external factor.

There are no specific guidance materials or programs that have been put in place regarding this factor. However, this is appropriate until better information regarding the influence of this factor is available.

FUEL PRICES			
Municipality's Level of Response →	Staff Awareness	Policies/Guidance	Implementation
Impact of Factor on Transit Ridership ↓			
	WATERLOO		
	- Gas prices contributed a large but temporary increase in ridership in 2008, and only one-third of survey respondents indicate gas prices as a major factor in switching to the bus		
	- GRT staff have sufficient understanding of ridership trends related to gas prices	- RTMP lacks guidance on this factor, but this is appropriate as there are other priorities for GRT	- There are no specific programs related to gas prices, but this is appropriate
	KINGSTON		
	- Rising gas prices have not, as yet, produced clear changes in transit ridership in the city		
	- KT staff have sufficient understanding of ridership trends related to gas prices	- KTMP provides no guidance on how to manage rising fuel costs, but this is appropriate	- There are no specific programs related to gas prices, but this is appropriate

4.6 Summary of External Factors for Kingston and Waterloo

Table 8 summarizes the predicted levels of influence that the external factors have on Kingston’s and Waterloo’s transit ridership in the short-medium range (5-20 years). It also summarizes the levels of response within each municipality. As a reminder, the variously coloured circles indicate the level of response of each municipality – in terms of staff and councillor awareness, policies/guidance materials, and implementation of initiatives. A coloured section of the circle indicates an appropriate response and a blank section indicates an inappropriate response.



















Staff Awareness: red  Implementation: blue 
Policies/Guidance: green  Inappropriate response: blank 

Table 8: Summary of external factors and municipal levels of response in Kingston and Waterloo

External Factor		Kingston		Waterloo	
		Predicted Influence on Ridership	Overall Municipal Level of Response	Predicted Influence on Ridership	Overall Municipal Level of Response
Population Growth and Density		+		+	
Demographics	Seniors	+		+	
	Students	—		+	
	Immigrants	○		+	
Regional Location		○		+	
Federal and Provincial Impacts		+		+	
Fuel Prices		○		+	

Chapter 5: Conclusions and Recommendations

5.0 Chapter Outline

The previous chapter presented the analysis of seven external factors affecting transit ridership in Kingston and Waterloo.

The objectives of this chapter are to:

- Make conclusions about the overall impacts of external ridership factors
- Provide specific recommendations to Kingston and Waterloo transit planning staff in response to the important factors and in relation to their current levels of response
- Identify areas for future research as they relate to this study

5.1 Conclusions

The summary table of the external factors and their influence on the City of Kingston's and Region of Waterloo's transit ridership reveals two important overall conclusions.

The first conclusion is that Waterloo has a stronger case for improving its transit system than does Kingston. This is evidenced by the greater number of factors that are expected to act positively on Waterloo transit than Kingston transit (more large plus signs). The most important factors for Waterloo are population growth and density, students and federal/provincial impacts; furthermore, the other four factors are expected to have positive influences as well. These factors can help maintain the momentum to improve Waterloo's transit system, since external factors are not as easily changed by local political ideology, public perceptions, local funding constraints, or other internal restrictions.

In Kingston, however, the only potentially large influence on ridership is the senior cohort (as long as services address senior transit needs). There are only two other factors that may have a positive ridership influence, while the student factor may have a very negative influence and the three remaining factors are expected to have no impact. Therefore, Kingston's drivers for

improving its transit system will need to be internal pressures (e.g. convincing councillors, improving staff capacity and strengthening policies).

The second conclusion relates to the overarching research questions – whether a municipality needs to grow and become large in order to continue to achieve greater transit ridership. Municipal size relates to a number of the external factors studied. Population growth and density are a function of size as large cities often attract higher rates of growth (they have achieved the critical mass of residents). Certain demographics, such as immigrants and new graduates, are attracted to large municipalities. Large areas often attract more funding from senior governments, and fuel prices seem to be higher in more populous areas. Hence, generally speaking, it can be said that size is important in influencing other factors.

For Waterloo, the results show that the region is growing and that this has been an important driver for bringing attention to the transit system. However, Waterloo also has a better level of response to most of the seven factors – this is shown by the five fully coloured circles compared to only two filled in circles for Kingston. Growth is important, but it is also important to have appropriate awareness, policies and initiatives.

Kingston lacks growth, so the city lacks a major driver for transit ridership. However, in the absence of growth, the City can improve its response to some of the other factors and take advantage of certain opportunities, such as attracting students and seniors.

These results may apply to other mid-sized municipalities in Canada, particularly to those that share similar characteristics (such as population growth, demographics and location). More importantly, the message of this thesis is applicable to mid-sized municipalities: it is important to take stock of the external trends that may be inhibiting their transit ridership growth. The data analysis matrix can be used by municipalities using the same or different sets of factors, to help evaluate levels of influence and internal levels of response. By using the matrix to organize levels of response in terms of staff awareness, policies and implementation of initiatives, this will relate internal responsiveness (either strengths or gaps) to the influence of the factors. This provides a check that responses are being appropriately allocated to the important factors and not wasted on non-important factors.

The following list makes general conclusions about each factor.

- **Population growth:** Main driver – if lacking, lose a lot of impetus for transit improvements
- **Seniors:** Unsure how important this will be generally since people living longer and healthier
- **Students:** Probably remain important, not only as current riders but as future adult riders
- **Immigration:** Trend not going away, but not big factors in Kingston or Waterloo at the moment
- **Regional location:** Important in terms of participating in regional transportation systems
- **Federal and provincial impacts:** Related to regional location – focus on larger urban centres and multi-municipality region for funding
- **Fuel prices:** Could become bigger impetus for transit in future, but low impact now

5.2 Recommendations

It is important for any transit agency to understand that ridership increases are more often achieved through implementing a combination of various strategies rather than one single strategy (TCRP 29, 1998, p. 1). The following section outlines recommendations for policies and projects for the range of external factors that have been analyzed.

Kingston

Population Growth and Density

- Set a firm urban boundary to encourage higher development densities; the current urban boundary is “soft” and will not achieve the Official Plan’s policy direction of intensification if suburban development is allowed to spread outward
- Fill with new development the “density gap” that connects the downtown with the western residential areas, which will help improve service efficiency for transit within the gap

Seniors

- Implement service improvements to specifically address seniors' needs, such as bus stops located closer to seniors residences/destinations and shorter headways particularly in non-peak hours
- Expand marketing efforts to promote KT service to the growing senior demographic

Students

- Implement service improvements that specifically address the needs of students, such as shorter travel times, late night service and service to student destinations
- Monitor new service improvements to intercity stations and resulting student ridership changes

Immigrants

- Collect data on immigrant transit usage to obtain a clear picture on the influence of this group on the city's ridership.
- Reconsider the extent of resources being put toward cultural sensitivity training for drivers and multi-language transit documents

Regional Location

- Continue with minimum monitoring efforts to examine the transit needs of residents in adjacent municipalities, such as Amherstview
- Continue to concentrate KT operations on the core city rather than expansion into municipalities from which long-distance commuters originate

Federal and Provincial Impacts

- Monitor opportunities to apply for senior government transit funding grants
- Conduct meetings between Kingston Transit and local MPs and MPPs to engage in partnership building, but concentrate on building partnerships with local city councillors

Fuel Prices

- Place low priority on monitoring gas prices as they relate to ridership
- If gas prices increase astronomically, consider marketing transit using this argument as ridership revenues will need to increase to offset the cost to refuel Kingston transit buses

Waterloo

Population Growth and Density

- The Region will continue to intensify its urban area as per the P2G directives, so transit service in the urban areas should continue to be improved to attract urban residents and choice riders
- As much as possible, continue to use the expected increase in population as rationale for expanding GRT service, since population growth and density are two major drivers of ridership

Seniors

- Conduct analysis on the ridership impact of seniors, which will help determine the services and other initiatives that may be needed to serve a growing seniors demographic going forward
- Work with developers to encourage the increasing trend of seniors moving into downtown condos; downtowns are better served by transit and can help attract more senior riders

Students

- Continue to introduce service expansion in key student areas as has been done in the past
- Ensure consultations with student bodies during the planning phases of the rapid transit project

Immigrants

- Collect data on immigrant transit usage to gain clarity on this group's ridership influence
- Develop an immigration strategy, in partnership with regional immigration organizations, to attract more immigrant riders, if the immigrant ridership data deems it necessary

Regional Location

- Continue to encourage improved servicing to the region from intercity transit operators, but without devoting significant resources to this task
- Analyze potential partnership with Guelph Transit to attract commuters

Federal and Provincial Impacts

- To ensure funding commitments for rapid transit are carried out, concentrate partnership building efforts between Grand River Transit and the federal and provincial governments until the project has begun construction
- Continue to lead initiatives that exemplify P2G implementation in order to help gain access to provincial grants in the future

Fuel Prices

- Continue to monitor ridership changes as they relate to increasing gas prices
- Improve transit services for choice riders so that this market segment can be retained through periods of high gas prices and low gas prices

5.3 Future Research

This thesis has evaluated the impacts that several factors, external to a municipality, can have on transit ridership according to published literature. It has also evaluated the specific impacts on two municipalities – the City of Kingston and Region of Waterloo. The analyzed factors are in no way an exhaustive list of the external influences that can affect ridership. A number of different studies have identified other factors. For example, TCRP Report 111 points to local economic conditions and cost and convenience of other modes as two other primary external factors. Additionally, internal factors are important to creating the auto disincentives and transit incentives that can help boost ridership. Among the most important is service frequency and area coverage. Others include fare and pricing strategies, parking policies, marketing and local council support for transit.

An analysis of internal factors for Kingston and Waterloo would be helpful to understand the complete transit picture. For example, it has been shown that students and seniors are important demographics for transit. In Kingston, ridership among these groups has decreased significantly in recent years. To augment the overview of policies and initiatives done in the city to attract these riders, deeper analysis on the policy context before and after the ridership losses would shed more light on the reasons for these specific losses.

This report provides some insights into the transit-supportive or transit-unsupportive conditions in Kingston and Waterloo. This can help each municipality's transit planners prepare for change and concentrate on the most important factors. Other municipalities in Canada, particularly mid-sized cities, can use these findings as a guidepost to narrow down their own analyses onto the important factors. For example, a city the size of Kingston and a similar distance away from an urban centre may rethink their immigration attraction efforts. A city or region the size of Waterloo may concentrate on interregional coordination with nearby municipalities in order to enhance their central transportation function, which can bring other benefits in terms of senior government funding.

References

- Armstrong, F. (2008, January 15). Transit use increases; service improvements, advertising campaign help fill seats: Official. *Kingston Whig-Standard*. Retrieved November 21, 2010 from <http://www.thewhig.com/ArticleDisplay.aspx?archive=true&e=858140>
- Andreas, W.J.H. (2007, January). Moving forward: Public transit in Canadian mid-sized cities. Master's Thesis: University of Calgary. Master Thesis: University of Calgary. Retrieved September 16, 2010 from <http://www.ucalgary.ca/~wjandrea/msctransit/finalreport.pdf>
- Berger, M. (2001). *The automobile in American history and culture: A reference guide*. Westport (CT): Greenwood Publishing Group. Retrieved January 17, 2011 from http://books.google.ca/books?id=oRwMv8iNP-MC&printsec=frontcover&dq=The+automobile+in+American+history+and+culture:+a+reference+guide&source=bl&ots=mZ-E9S2DAr&sig=ccEILBgqXvsm0_HMy_ArYYTorZ8&hl=en&ei=IKk1TdfSM4KglAfV09jSCg&sa=X&oi=book_result&ct=result&resnum=4&ved=0CDAQ6AEwAw#v=onepage&q&f=false
- Blumenberg, E. & Evans, A. (2010). Planning for demographic diversity: The case of immigrants and public transit. *Journal of Public Transportation*, Vol. 13, No. 2. Retrieved November 21, 2010 from <http://www.nctr.usf.edu/jpt/pdf/JPT13-2Blumenberg.pdf>
- Borzykowski, B. (2010, November 17). Why is gas at \$1.10 a litre? *Toronto Star*. Retrieved November 18, 2010 from <http://www.moneyville.ca/blog/post/892155--why-is-gas-at-1-10-a-litre>
- Bunting, T., Fillion, P., Hoernig, H., Seasons, M. & Lederer, J. (2007, winter). Density, size, dispersion: Towards understanding the structural dynamics of mid-size cities. *Canadian Journal of Urban Research*, Vol. 16, Issue 2, pp. 27-52. Institute of Urban Studies.
- City of Kingston¹ (2004, July). Kingston transportation master plan: Final report. Prepared by Dillon Consulting for the City of Kingston.

City of Kingston² (2005, January). Kingston transit 5-year business plan 2005-2009: Final report. Prepared by IBI Group for the City of Kingston.

City of Kingston³ (2010). Kingston's official plan. Retrieved November 25, 2010 from <http://www.cityofkingston.ca/residents/development/officialplan/index.asp>

City of Kingston⁴ (2009, January). *Newsletter #2 – City of Kingston draft official plan*. Retrieved July 16, 2009 from http://www.cityofkingston.ca/pdf/planning/officialplan/OP-Newsletter_01-2009.pdf

City of Kingston⁵ (2009, May). Kingston community profile 2009: A socio-demographic analysis of Kingston, Ontario, Canada. Retrieved December 11, 2010 from http://spckingston.ca/kcp/Kingston_Community_Profile_SPC_2009-05-28_BW.pdf

City of Kingston⁶ (2004, July). Urban growth strategy final report. Prepared by J.L. Richards & Associates Ltd. Retrieved February 10, 2011 from http://www.cityofkingston.ca/pdf/urbangrowth/UGS_FinalReport.pdf

City of Kingston⁷ (2008, September 11). Kingston transit discussion paper. Staff report prepared for the Environment, Infrastructure and Transportation Policies Committee, City of Kingston.

City of Kingston⁸ (2011, February 1). Town and gown strategic plan – Progress report. Staff report to Mayor and Council. Retrieved March 8, 2011 from http://www.cityofkingston.ca/pdf/council/agenda/2011/COU_A0511-11048.pdf

City of Kingston⁹ (2003, August 29). Transit service improvements debut September 2. Kingston Transit News Release. Retrieved May 10, 2011 from <http://www.cityofkingston.ca/cityhall/press/release.asp?mode=show&id=930>

City of Kingston¹⁰ (2005, April 29). Transit expands on-board bicycle rack program: One tonne challenge funding boosts ‘rack and roll’ service. Kingston Transit News Release. Retrieved May 20, 2011 from <http://www.cityofkingston.ca/cityhall/press/release.asp?mode=show&id=1443>

City of Kingston¹¹ (2006, April 27). Citizens praised for reducing greenhouse gases. News Release. Retrieved May 20, 2011 from <http://www.cityofkingston.ca/cityhall/press/release.asp?mode=show&id=1771>

City of London (2010, May 19). London 2030 transportation master plan: Public workshop #2 meeting report. Retrieved July 4, 2011 from http://www.london.ca/Transportation_Planning/pdfs/LondonTMPPublicWorkshop2-FinalReport.pdf

City of Waterloo (2005). Community profile 2005. Produced by Economic Development and Marketing, City of Waterloo. Retrieved December 10, 2010 from http://www.city.waterloo.on.ca/Portals/57ad7180-c5e7-49f5-b282-c6475cdb7ee7/CS_EDM_documents/CP05.pdf

Crislip, H. & Bush, J. (Eds.) (2009). Well within reach: America’s new transportation agenda. Prepared by the Miller Center of Public Affairs, University of Virginia, for the David R. Goode National Transportation Policy Conference, September 9-11, 2009. Retrieved February 5, 2011 from http://ntl.bts.gov/lib/34000/34500/34505/conf_2009_transportation.pdf

[CTT¹] Canada’s Technology Triangle (2010). Why invest here? Strategic positioning. Retrieved November 22, 2010 from http://www.techtriangle.com/strategic_positioning

[CTT²] Canada’s Technology Triangle (2009). Top employers in Waterloo Region. Retrieved December 10, 2010 from http://www.techtriangle.com/top_employers

[CUTA¹] Canadian Urban Transit Association (2004, August). Transit’s next generation: Working with Canada’s youth. Issue paper No. 8. Retrieved February 28, 2011 from

http://www.cutaactu.ca/en/publicationsandresearch/resources/IssuePaperNo.8_TransitsNextGeneration_WorkingwithCanadasYouth.pdf

[CUTA²] Canadian Urban Transit Association (2010, January 31). The economic impact of transit investment: A national survey. Prepared by Metropolitan Knowledge International, McCormick Rankin Corporation and Casello, J. Retrieved April 20, 2011 from http://www.cutaactu.ca/en/publicationsandresearch/resources/Final_CUTA%20-%20Economic%20Benefits%20of%20Transit%20-%20Final%20Report%20E%20Jul2010.pdf

[CUTA³] Canadian Urban Transit Association (2009, February). Federal, provincial and territorial funding of public transit in Canada: A compendium. Retrieved May 3, 2011 from <http://sirepub.edmonton.ca/sirepub/cache/2/v2cv1155jb2ma255xksqq145/8063805032011081536328.PDF>

Creswell, J.W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches*. (3rd ed.) Thousand Oaks (CA): Sage Publications, Inc.

Dalton, M. (2010, March 2). Local tourism board could take lead in attracting visitors to wider region. *The Record*. Retrieved December 10, 2010 from <http://news.therecord.com/news/article/678729>

Foot, D. (with Stoffman, D.) (1996). *Boom, Bust and Echo 2000: Profiting from the Demographic Shift in the New Millennium*. Toronto: Macfarlane Walter and Ross.

Frigon, M. (2007, August 8). Gasoline prices and the impact on demand. Canada Library of Parliament. Retrieved November 17, 2010 from <http://www2.parl.gc.ca/Content/LOP/ResearchPublications/prb0755-e.pdf>

Frumkin, H., Frank, L. & Jackson, R. (2004). *Urban sprawl and public health: Designing, planning, and building for healthy communities*. Washington, DC: Island Press. Retrieved January 15, 2011 from <http://books.google.ca/books?id=VPdDIFfFthIC&printsec=frontcover&dq=Urban+sprawl+and+public+health+:+designing,+planning,+and+building+for+healthy+communities&source=bl&ots=W8y->

[3EoBfE&sig=XIE4Rrt7RyrIKJvtUeMVevftoFQ&hl=en&ei=ZS02TY3KKYa8lQec6fG3Cg&sa=X&oi=book_result&ct=result&resnum=5&ved=0CEYQ6AEwBA#v=onepage&q&f=false](http://www.uregina.ca/sipp/)

Fulton, M., Partridge, M. & Olfert, R. (2006, January 17). Growing Saskatchewan in an urban age. Presentation prepared for Saskatchewan Institute of Public Policy: A Public Forum. University of Regina. Retrieved July 4, 2011 from www.uregina.ca/sipp/

Gerretsen, J. (2010, February 22). Ontario supports transportation strategy in Kingston. News brief. Retrieved November 22, 2010 from <http://www.johngerretsen.onmpp.ca/pressreleases.aspx?id=18>

Government of Ontario¹ (2010, April 30). Municipalities say Ontario's gas tax program is keeping transit systems moving. Retrieved November 22, 2010 from <http://news.ontario.ca/mto/en/2010/04/municipalities-say-ontarios-gas-tax-program-is-keeping-transit-systems-moving.html>

Government of Ontario² (2010, June 28). Public transit funding for Waterloo Region. News Release. Retrieved March 1, 2011 from <http://news.ontario.ca/mto/en/2010/06/public-transit-funding-for-waterloo-region.html>

Haire, A. & Machemehl, R. (2010). Regional and modal variability in effects of gasoline prices on U.S. transit ridership. *Journal of the Transportation Research Board*, No. 2144 (pp. 20-27). Washington, D.C.: Transportation Research Board of the National Academies.

Hendra, P. (2010, November 13). City to focus on attracting immigrants. *Kingston Whig-Standard*. Retrieved November 21, 2010 from <http://www.thewhig.com/ArticleDisplay.aspx?e=2844543>

Hodge, G. & Gordon, D. (2008). *Planning Canadian communities: An introduction to the principles, practice, and participants* (5th ed.). Toronto: Nelson.

Infrastructure Canada (2010). Building Canada: The plan. Retrieved November 22, 2010 from <http://www.buildingcanada-chantierscanada.gc.ca/plandocs/booklet-livret/booklet-livret06-eng.html>

[KIP] Kingston Immigration Partnership (2010). Strategy 2010. Retrieved March 16, 2011 from <http://kipcouncil.ca/downloads/kipstrategy-2010.pdf>

Kingston Whig-Standard (2008, May 7). Bus pass shortage a temporary one. *Kingston Whig-Standard*, article ID #1017440. Retrieved March 7, 2011 from <http://www.thewhig.com/ArticleDisplay.aspx?archive=true&e=1017440>

Labrecque, H. (1998, September 10). Measurement of efficiency in urban mass transit via a data envelopment analysis. Master Thesis: University of New Brunswick. Retrieved September 27, 2010 from <http://dspace.hil.unb.ca:8080/bitstream/handle/1882/893/MQ38388.pdf?sequence=1>

Lindstrom, M. & Bartling, H. (Eds.) (2003). *Suburban sprawl: Culture, theory, and politics*. Lanham (MD): Rowman and Littlefield Publishers, Inc. Retrieved January 15, 2011 from http://books.google.ca/books?id=RQN0OXI02qMC&printsec=frontcover&dq=Suburban+sprawl+:+culture,+theory,+and+politics&source=bl&ots=fGJtFAQtpu&sig=l-N4viQeG5YtbHVPZmaq_51m7A&hl=en&ei=nZYzTaXnK4K0IQeIwOTfCg&sa=X&oi=book_result&ct=result&resnum=2&ved=0CCMQ6AEwAQ#v=onepage&q&f=false

Litman, T. & Fitzroy, S. (2010, July 9). Safe travels: Evaluating mobility management traffic safety impacts. Victoria Transport Policy Institute. Retrieved September 14, 2010 from <http://www.vtpi.org/safetrav.pdf>

Mitchell, J. (2001, July 1). Urban sprawl. *National Geographic*. Retrieved January 14, 2011 from <http://ngm.nationalgeographic.com/ngm/data/2001/07/01/html/fulltext3.html>

[MMAH] Ontario Ministry of Municipal Affairs and Housing (2005). *Provincial policy statement*. Queen's Printer for Ontario. Retrieved July 12, 2009 from <http://www.mah.gov.on.ca/Asset1421.aspx>

[MMAH/MTO] Ontario Ministry of Municipal Affairs and Housing and Ministry of Transportation (1992, April). Transit-supportive land use planning guidelines. Retrieved December 20, 2010 from <http://www.mah.gov.on.ca/AssetFactory.aspx?did=1179>

[MMAH/OPPI] Ontario Ministry of Municipal Affairs and Housing and Ontario Professional Planners Institute (2009, fall). Planning by design: A health communities handbook. Retrieved December 23, 2010 from <http://www.mah.gov.on.ca/AssetFactory.aspx?did=7171>

MMM Group, City of Brampton & City of Mississauga (2009, February). Hurontario Main Street study: Directions report. Retrieved July 4, 2011 from [http://www.hurontario-main.ca/PDFs/Hurontario%20Directions%20Report%20\(Lo-Res\).pdf](http://www.hurontario-main.ca/PDFs/Hurontario%20Directions%20Report%20(Lo-Res).pdf)

Morgan, C., Sperry, B., Warner, J., Protopapas, A., Borowiec, J. Higgins, L. & Carlson, T. (2010, February). Potential development of an intercity passenger transit system in Texas – Final project report. Texas Transportation Institute. Retrieved November 19, 2010 from <http://ntl.bts.gov/lib/33000/33100/33102/0-5930-2.pdf>

[MPIR] Ontario Ministry of Public Infrastructure Renewal (2006). Places to grow: A guide to the growth plan for the Greater Golden Horseshoe. Queen's Printer for Ontario. Retrieved November 22, 2010 from <https://www.placestogrow.ca/images/pdfs/FINAL-GUIDE-ENG.pdf>

Oldread, K. (2011, February). How well do neighbourhood characteristics predict transit ridership in a college town? Master Thesis: University of Massachusetts. Retrieved March 28, 2011 from [http://scholarworks.umass.edu/cgi/viewcontent.cgi?article=1555&context=theses&sei-redir=1#search="transit+ridership+geographic+location"](http://scholarworks.umass.edu/cgi/viewcontent.cgi?article=1555&context=theses&sei-redir=1#search=)

Ontario Centre for Municipal Best Practices (2004, February). Urban transit – Universal pass. Best Practice Summary Report TR-04-03. Case study of Hamilton Street Railway, City of Hamilton. Retrieved November 21, 2010 from <http://www.omkn.ca/AM/Template.cfm?Section=Home&CONTENTID=12238&TEMPLATE=/CM/ContentDisplay.cfm>

Outhit¹ J. (2010, June 16). Waterloo Region boomers will shun rapid transit, scholar predicts. *The Record*. Retrieved November 21, 2010 from <http://news.therecord.com/article/729257>

Outhit², J. (2011, May 25). Transit getting major boost. *The Record*, Sect. A:1 (col. 5). Retrieved May 25, 2011 from <http://www.therecord.com/news/local/article/537003--major-transit-expansion-approved>

Peck, M. (2010, June). Barriers to using fixed-route public transit for older adults. MTI Report 09-16. Published by Mineta Transportation Institute, San José State University, San José, California. Retrieved November 20, 2010 from http://ntl.bts.gov/lib/34000/34800/34830/2402_09-16.pdf

Pederson, E.O. (1980). *Transportation in cities*. Elmsford (NY): Pergamon Press.

Pender, T. (2010, November 20). Older adults are moving away from suburbs. *The Record*, Sect. A:9 (col. 1).

PriceWaterhouseCoopers (2008, April). Population aging and public infrastructure: A literature review of impacts in developed countries. Study prepared for Infrastructure Canada's Economic Analysis and Research Division, Government of Canada. Retrieved February 17, 2011 from <http://www.infc.gc.ca/altformats/pdf/rs-rr-2008-02-eng.pdf>

Pritchard, D. (2007, December 10). Notes on Pushkarev and Zupan, public transportation and land use policy. Book review of *Public Transportation and Land Use Policy* (Pushkarev, B. & J., Zupan). Retrieved February 8, 2011 from <http://davidpritchard.org/sustrans/PusZup77/index.html>

Region of Waterloo¹ (2010, June 22). Moving forward 2031: Regional transportation master plan (RTMP). Staff report to Planning and Works Committee. Retrieved October 12, 2010 from http://www.movingforward2031.ca/downloads/jun10/MOVING_FORWARD_2031_REGI_ON.pdf

Region of Waterloo² (2010, December 22). Regional official plan. Approved with modification by the Ministry of Municipal Affairs and Housing, under appeal to the Ontario Municipal Board. Retrieved May 20, 2011 from

Region of Waterloo³ (2009, winter). GRT celebrates 10 years of service. *Region News newsletter*, p. 6.

Region of Waterloo⁴ (2010, March). 2010 year-end population and household estimates. Planning Information Bulletin. Retrieved April 18, 2011 from [http://www.region.waterloo.on.ca/web/region.nsf/DocID/A288897047333422852573700060C1D7/\\$file/2010%20POP%20BULLETIN.pdf?openelement](http://www.region.waterloo.on.ca/web/region.nsf/DocID/A288897047333422852573700060C1D7/$file/2010%20POP%20BULLETIN.pdf?openelement)

Region of Waterloo⁵ (2010, April). Older adults health status report. Retrieved February 17, 2011 from [http://chd.region.waterloo.on.ca/web/health.nsf/4f4813c75e78d71385256e5a0057f5e1/8DE2F37FB8225613852576FE0052E561/\\$file/OlderAdults.pdf?openelement](http://chd.region.waterloo.on.ca/web/health.nsf/4f4813c75e78d71385256e5a0057f5e1/8DE2F37FB8225613852576FE0052E561/$file/OlderAdults.pdf?openelement)

Region of Waterloo⁶ (2010, May 18). Regional transportation master plan: Moving forward 2031 (RTMP). Retrieved November 21, 2010 from [http://www.region.waterloo.on.ca/web/region.nsf/c56e308f49bfeb7885256abc0071ec9a/B035CC0357B6E3E585256E440068BC7B/\\$file/RTMP_FINAL_REPORT_PDF.pdf?openelement](http://www.region.waterloo.on.ca/web/region.nsf/c56e308f49bfeb7885256abc0071ec9a/B035CC0357B6E3E585256E440068BC7B/$file/RTMP_FINAL_REPORT_PDF.pdf?openelement)

Region of Waterloo⁷ (2009, December). iXpress central transit corridor express project: Urban transportation showcase program final report. Retrieved November 22, 2010 from [http://www.grt.ca/web/transit.nsf/vwArticles/F6DE7F8752F8C8C985257640004DC050/\\$file/Region%20of%20Waterloo%20UTSP%20Final%20Report%20Dec_09.pdf?open](http://www.grt.ca/web/transit.nsf/vwArticles/F6DE7F8752F8C8C985257640004DC050/$file/Region%20of%20Waterloo%20UTSP%20Final%20Report%20Dec_09.pdf?open)

Region of Waterloo⁸ (2008, May 13). Update – Corporate environmental sustainability strategy. Staff report from Region of Waterloo Facilities Management and Fleet Services to the Administration and Finance Committee. Retrieved January 20, 2011 from [http://www.region.waterloo.on.ca/85256AE80070E40F/\\$All/7DFFD49731BA1FC2852575BC0055B187/\\$file/CR-FM-08-012.pdf?openelement](http://www.region.waterloo.on.ca/85256AE80070E40F/$All/7DFFD49731BA1FC2852575BC0055B187/$file/CR-FM-08-012.pdf?openelement)

Region of Waterloo⁹ (2009, April 20). Existing transportation system context overview: Regional transportation master plan (Draft). Prepared by AECOM and MRC for the Region of Waterloo. Retrieved February 10, 2011 from http://www.movingforward2031.ca/downloads/30_04_09/RTMP_EXISTING_TRANS_SYSTEM.pdf

Region of Waterloo¹⁰ (2001). Grand River Transit 5-year business plan 2001-2005.

Region of Waterloo¹¹ (2006). Immigrants and growth: A look at health and employment in Waterloo Region. Prepared by J. Maan Miedema and D. Vandebelt, Public Health Department. Retrieved March 16, 2011 from [http://chd.region.waterloo.on.ca/web/health.nsf/4f4813c75e78d71385256e5a0057f5e1/4AD3E53C78B52E5085256E780060EDDD/\\$file/IMMIGRANTS_GROWTH.pdf?openelement](http://chd.region.waterloo.on.ca/web/health.nsf/4f4813c75e78d71385256e5a0057f5e1/4AD3E53C78B52E5085256E780060EDDD/$file/IMMIGRANTS_GROWTH.pdf?openelement)

Region of Waterloo¹² (2009, September). Immigrants in Waterloo Region – Fact sheets: Immigration arrivals. Part of a series of immigration fact sheets published by the Region of Waterloo Public Health department. Retrieved March 19, 2011 from [http://chd.region.waterloo.on.ca/web/health.nsf/0/4AD3E53C78B52E5085256E780060EDDD/\\$file/Immigration_Arrivals.pdf?openelement](http://chd.region.waterloo.on.ca/web/health.nsf/0/4AD3E53C78B52E5085256E780060EDDD/$file/Immigration_Arrivals.pdf?openelement)

Robl, E. (2011, April 5). Rail systems update: Reaching critical mass in rail transit. Retrieved July 3, 2011 from <http://www.masstransitmag.com/article/10221210/rail-systems-update-reaching-critical-mass-in-rail-transit>

Rubin, J. (2009). *Why your world is about to get a whole lot smaller*. Toronto: Random House Canada.

Simone¹, R. (2010, November 2). Region on verge of becoming a 'really big city.' *The Record*. Retrieved November 14, 2010 from <http://www.therecord.com/news/business/article/285849--region-on-verge-of-becoming-a-really-big-city>

Simone², R. (2010, November 2). Condo sales boom in Waterloo Region. *The Record*, Sect. A:1 (col. 4). Retrieved November 14, 2010 from <http://news.therecord.com/article/804728>

Statistics Canada (2006). 2006 census: Community profiles: Kingston (city) and Waterloo (regional municipality). Retrieved December 11, 2010 from <http://www12.statcan.gc.ca/census-recensement/2006/dp-pd/prof/92-591/details/page.cfm?Lang=E&Geo1=CSD&Code1=3510010&Geo2=PR&Code2=35&Data=Count&SearchText=kingston&SearchType=Begins&SearchPR=01&B1=All&Custom=> and <http://www12.statcan.gc.ca/census-recensement/2006/dp-pd/prof/92-591/details/page.cfm?Lang=E&Geo1=CD&Code1=3530&Geo2=PR&Code2=35&Data=Count&SearchText=Waterloo&SearchType=Begins&SearchPR=01&B1=All&Custom=>

Taaffe, E., Gauthier, H. & O'Kelly, M. (1996). *Geography of Transportation, 2nd Ed.* Upper Saddle River (NJ): Prentice-Hall Inc. Retrieved March 21, 2011 from http://books.google.ca/books?id=N60qf7WynaEC&pg=PA188&lpg=PA188&dq=transit+ridership+geographic+location&source=bl&ots=TNcR5LENHj&sig=ma7Kc9-0yCLgmU2teSjx3fr5UZ0&hl=en&ei=arOHTfSPL8b-rAH1sZmzBg&sa=X&oi=book_result&ct=result&resnum=3&ved=0CCcQ6AEwAjkK#v=onepage&q=transit%20ridership%20geographic%20location&f=false

Taylor, B., Miller, D., Iseki, H. & Fink, C. (2008, June 7). Nature and/or nurture? Analyzing the determinants of transit ridership across U.S. urbanized areas. *Transportation Research Part A* (2008). Retrieved March 28, 2011 from <http://www.uctc.net/papers/869.pdf>

[TCRP 29] Transit Cooperative Research Program Research Results Digest 100 (1998, August). Continuing examination of successful transit ridership initiatives. Prepared by R. Stanley of Cambridge Symantics Inc. Retrieved January 29, 2011 from http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rrd_29.pdf

[TCRP 39] Transit Cooperative Research Program Synthesis 39 (2001). Transportation on college and university campuses: A synthesis of transit practice. Prepared by J. Miller. Washington, D.C.: National Academy Press. Retrieved February 28, 2011 from <http://onlinepubs.trb.org/onlinepubs/tcrp/tsyn39.pdf>

[TCRP 78] Transit Cooperative Research Program Synthesis 78 (2008). Transit systems in college and university communities. Prepared by T. Krueger and G. Murray. Retrieved February 23, 2011 from http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_syn_78.pdf

[TCRP 82] Transit Cooperative Research Program Report 82 (2002). Improving public transit options for older persons, volume 2: Final report. Prepared by J. Burkhardt, A. McGavock, C. Nelson and C. Mitchell. Retrieved February 21, 2011 from http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_82v2a.pdf

[TCRP 111] Transit Cooperative Research Program Report 111 (2007). Elements needed to create high ridership transit systems. Prepared by TranSystems with Planners Collaborative, Inc. and Tom Crikelair Associates. Retrieved November 20, 2010 from http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_111.pdf

The Planning Partnership (2011, February 24). Southwest Kitchener urban areas study: Land use analysis 2.0. Retrieved May 20, 2011 from http://www.kitchener.ca/en/insidcityhall/resources/Section2_LandUseAnalysis.pdf

Toronto Board of Trade (2010). Toronto as a global city: Scorecard on prosperity. Retrieved November 18, 2010 from http://bot.com/Content/NavigationMenu/Policy/Scorecard/Scorecard_on_Prosperty_2010_FINAL.pdf

Transport Canada (2010). iXpress central transit corridor express project – Summary of final report. Retrieved November 22, 2010 from <http://www.tc.gc.ca/eng/programs/environment-utsp-waterloo-1979.htm>

Tripp, R. (2007). Kingston going grey; 65+ age group increasing in all major Canadian metropolitan areas. *Kingston Whig-Standard*. Retrieved November 20, 2010 from <http://www.thewhig.com/ArticleDisplay.aspx?archive=true&e=616698>

University of Lethbridge (2009). GSA/LA transit's U-pass program. Retrieved November 21, 2010 from <http://www.upass.ubc.ca/okanagan/u-pass/>

Urban Transportation Task Force (2009, October). Urban transit in Canada: Taking stock of recent progress. Retrieved April 20, 2011 from http://www.cutaactu.ca/en/publicationsandresearch/resources/UTTF_Report_Oct09_EN.pdf

Van Vugt, M., Van Lange, P. & Meertens, R. (1996). Commuting by car or public transportation? A social dilemma analysis of travel mode judgements. *European Journal of Social Psychology*, Vol. 26, pp. 373-395. Retrieved November 15, 2010 from <http://www.professormarkvanvugt.com/files/CommutingbyCarorPublicTransportation-EuropeanJournalofSocialPsychology-1996.pdf>

Vuchic, V.R. (2007). Urban public transportation systems and technology (chap. 1). Hoboken (NJ): John Wiley & Sons Inc.

Vuchic, V. (2005). Transportation for livable cities. New Brunswick (NJ): Center for Urban Policy Research.

[WRLIPC] Waterloo Region Local Immigration Partnership Council (2010, April). An environmental scan of English language services in Waterloo Region. Prepared by the Centre for Community Based Research. Retrieved March 21, 2011 from <http://www.communitybasedresearch.ca/resources/Projects/LIPC/Chapter%206%20English%20Language%20Scan%20Final%20Report.pdf>

Yago, G. (1984). *The decline of transit: Urban transportation in German and U.S. cities, 1900-1970*. Cambridge (UK): Cambridge University Press.

Appendix 1: Interview Template with Kingston and Waterloo Transit Staff

1. What is your current position with KT (GRT)? How many years have you worked in this role and at KT (GRT) in total?
2. What are your main areas of responsibility?
3. Approximately how many people do you work with on a regular basis?
4. What other positions have you had in the transit/transportation industry?
5. IF NO OTHER POSITIONS: Does your current position relate closely with what you studied? (Consider the last two years of education you completed.)
6. How would you describe the transit agency's organizational structure? (E.g. lines of communication, relationships between planning staff, operating staff and maintenance, relationships with members of Council, relationships/protocols with area municipalities)
7. What is the current transit modal split? What is the target modal split in 5 and 10 years?
8. In Canada or internationally, which city do you believe is leading the way in terms of its transit system? How does the City's (Region's) transit system compare to this?

9. In your view, please rank from 1 to 6 the most important factors that led to the undertaking of the network redesign (rapid transit) project, where 1 is most important and 6 least important:

Council initiated/supported the project

Government staff “sold” the project

Population and growth forecasts

Public interest and support

Provincial and/or federal policies

Other: _____

10. Out of the 13 City Councillors (16 Regional Councillors), how many would you say are “supportive” of the network redesign (RT) project in the City (Region), as well as ongoing funding for transit operations?

11. In your assessment, how does the current political climate in the City (Region) compare to 5 years ago in terms of willingness to support or finance transit projects and operations?

12. In your view, please rank from 1 to 6 the amount of political focus and resource allocation the City (Region) gives to these alternatives, where 1 receives the most focus and 6 the least:

Transit

Road construction

Economic development

Housing and family services

Recreation and leisure

Public health

13. The following factors are sometimes thought to influence transit ridership. For each, please indicate the degree to which you believe it would have an impact on transit ridership in general (i.e. not specific to the City (Region)), then indicate whether you believe the factors will have a significant or insignificant impact specifically on Kingston (Waterloo) over the next 10 years.

H = high impact on transit ridership, M = medium impact, L = low impact

S = Will be significant to transit ridership in the City (Region)

NS = Will not be significant to transit ridership in the City (Region)

Region:	in general:			to the	
	H	M	L	S	NS
Population increase	H	M	L	S	NS
Aging population	H	M	L	S	NS
Greater preference for high density housing	H	M	L	S	NS
Higher immigration levels	H	M	L	S	NS
Decreasing auto ownership	H	M	L	S	NS
Increase in average income	H	M	L	S	NS

14. When the fuel price increased to over \$1/litre in the past few years, did the transit agency see an increase in ridership? If so, has this increase been sustained?

15. Since the amalgamation of the two townships and the city in 1998 (amalgamation of Kitchener Transit and Cambridge Transit into GRT in 2000), what are 2 things that have improved and 2 major challenges that have resulted?
16. Prior to the current network redesign (RT) project, what were the two most important proposals or projects undertaken by KT (GRT)?
- a. Were they implemented? Why or why not?
 - b. If they were implemented, were they successful? Why or why not?
 - c. How were these proposals initially created (e.g. internal working group, activist group, public comments)?
17. How do you measure the effectiveness of the transit system? Are there benchmarks that the agency refers to?
18. Do you have any further comments you'd like to make about KT (GRT) currently or in the future, either related or not related to anything we've discussed today?

4. In your view, please identify and briefly describe up to 5 major changes that have occurred in the City (Region) in the past 10 years, and indicate how you believe each change has impacted transit ridership. For example, if change #1 led to a large decrease in transit ridership, put an X in the box under “strong negative”. If change #2 led to slightly higher ridership, put an X under “weak positive”.

CHANGE #1:

CHANGE #2:

CHANGE #3:

CHANGE #4:

CHANGE #5:

	Strong positive	Weak positive	No impact	Weak negative	Strong negative
CHANGE #1:					
CHANGE #2:					
CHANGE #3:					
CHANGE #4:					
CHANGE #5:					

5. What have you heard are the top 3 concerns among residents, students and business owners?

Residents:

Students:

Business Owners:

6. What do you hear from residents, students and business owners in terms of what elements they would like in the transportation system?

Residents:

Students:

Business Owners:

7. Why is the City (Region) undertaking the network redesign (rapid transit) project *now*? In other words, what are the *current* conditions that motivate the present undertaking of this project?

8. Out of the 13 City Councillors (16 Regional Councillors), how many would you say are supportive of the network redesign project (RT project) in the City (Region), as well as ongoing funding for transit operations?

Appendix 3: Detailed Presentation of Interview Results

The following text presents the most relevant interview responses. These figures are referred to under staff awareness within in each external factor.

Major Interview and Survey Responses

The primary goals of the staff interviews and councillor surveys were to gather information and opinions from staff members and council members. Participants were asked about transit priorities and projects, important changes that have occurred in the municipality, governance structures and some ridership data. They were also asked to offer their opinions about the significance of external ridership factors within the municipality, the perceived support for transit within council, and principal concerns among residents regarding transit.

To help determine the influence of ridership factors, some of the questions related to the transit system in general while other questions related specifically to the current transit improvement projects underway. In Kingston, this is the transit network redesign project – route realignments, creation of new routes, servicing improvements and consideration of express routes. In Waterloo, this is the rapid transit project – implementation of a light rail transit route and adapted rapid bus route along the region’s primary transit corridor, with additional express bus routes and associated route realignments and service improvements through the rest of the network.

Transit Staff Interviews

The following tables summarize the salient results from the interviews. The interview questions that relate to each figure are in italics. As necessary, wording changes for the Waterloo Region interviews are in parentheses. These responses will be referred to under staff awareness within in each external factor.

Question 9: In your view, please rank from 1 to 6 the most important factors that led to the undertaking of the network redesign (rapid transit) project, where 1 is most important and 6 least important.

Kingston Rankings

	K1	K2	K3	K4	Average Ranking
Council initiated/supported the project	1	1	1	1	1
Other	N/A	N/A	2 Kingston's desire to become Canada's most sustainable city	1a Desire to be greenest community in Canada	1.5
Government staff "sold" the project	2	2	5	2	2.75
Public interest and support	3	3	3	3	3
Population and growth forecasts	5	4	4	4	4.25
Provincial and/or federal policies	4	5	6	5	5

Figure 42: Question 9 interview results for Kingston, showing ranking of internal and external factors important to undertaking of transit network redesign project

For this question, interview participants were in strong agreement over the reasons why the transit network redesign project was undertaken. It is useful to ask specifically about the network redesign project because this is a project with which all participants are involved, and it is an important component of the overall transit service review undertaken by the City in 2008. Participants reported that a few members of Council made a motion to do a transit review and find ways to improve service. One respondent who has been a long-time employee of the City (K1) provided additional insight for this question. K1 stated that it was in fact a former Chief Administrative Officer of the City, originally from Manitoba, who had a keen interest in transit and “planted the seed” with Kingston councillors to also become more attentive to transit’s needs and the role it plays in the community.

Two participants also provided an alternate motive for undertaking major transit improvements – the City’s stated vision to become Canada’s most sustainable city. The Sustainable Kingston Plan is a document approved by City Council in June 2010 that outlines this vision. The development of the plan was guided by a City-led steering committee through a two-year process, which involved community charettes, stakeholder consultations and online surveys. One of the goals of the plan is to increase ridership on public transit; the indicator associated with this goal is transit trips per capita (no specific target is set). The interview participants stated that the current Council, as well as the city’s residents, are concerned with sustainability. This concern helps explain why transit is of particular interest to Council, since transit is considered a more sustainable travel mode compared to driving a vehicle (especially if the vehicle only has one occupant).

The second most important impetus for the network redesign project was the efforts on the part of municipal staff (excluding elected officials). The intent of the question was to ask participants whether the motivation for the transit project began “from the ground up” or due to a “champion” at the staff level. On average, the interview participants thought that Kingston employees played an important role in leading to the undertaking of the network redesign project, with a ranking of 2.75 out of the possible 6 reasons listed. K1 and K4 indicated that once staff received the direction from Council to take a look at existing transit service, they developed their own approach to the task – rather than simply hand it off to consultants – and kept councillors well-informed.

Public interest was considered the third most motivating factor for the transit project. The community’s support for sustainability bolstered Council’s renewed transit focus, but participants indicate it was more of a minor factor.

Participants agreed on the fourth and fifth least important motivators – growth forecasts and upper-tier government support, respectively. While participants recognize that other orders of government recognize transit from a public policy perspective, this factor played no big role for the transit initiative. Kingston’s population growth forecasts have historically been, and continue to be, low, so this factor also was not important. K2 believes future ridership growth needs to come from current non-transit riders rather than population growth.

Waterloo Rankings

Kingston Rankings

	W1	W2	W3	W4	Average Ranking	Average Ranking
Council initiated/supported the project	1	4	2	1	2	1
Government staff "sold" the project	3	1	2	4	2.5	1.5
Population and growth forecasts	4	3	2	2	2.75	2.75
Provincial and/or federal policies	5	2	1	5	3.25	3
Public interest and support	2	5	3	3	3.25	4.25
Other	N/A	N/A	N/A	N/A		5

Figure 43: Question 9 interview results for Waterloo, showing ranking of internal and external factors important to undertaking of rapid transit project

In contrast to the Kingston results above, Waterloo respondents did not clearly agree on the main factor that motivated the Region’s rapid transit project (currently in the planning stages). Rather, all the factors listed in question 9 were seen as most important or second most important by at least one participant. One participant clarified that the five factors are iterative, incentivizing transit programs at different stages. Therefore, the stratification among the factors is not strong.

Similar to Kingston respondents, Waterloo respondents overall indicated that Council support was the most important motivating factor. Respondents W1 and W4 said that Council support is critical in order to get the project going. A proposed route for rapid transit service has been considered since the late 1960s, said W1, so without Council support such a proposal will never become more than a conceptual line drawn on a map.

Government staff played an important role in the projects that directly led to the Region’s present focus on rapid transit. W1 indicates that staff have been able to show how such a major transit project fits into the Region’s overall plan for growth management, with provincial policies

and with public opinion. Along the same line of thinking, W2 believes that the Region's community planning department showed how rapid transit could encourage intensification in order to deal with future growth. The previous Chief Administrative Officer was cited as a key champion of this notion.

Population and growth forecasts played a fairly important role in the motivation for rapid transit. Respondent W4 says that the forecast population growth for the region to 729,000 by 2031 is making the need for rapid transit obvious now. For W3, the forecasts are a critical input because the larger effort of the Region is about managing growth, and rapid transit is a part of that.

Public interest and provincial/federal policies each received the same average score. While W2 notes that the public was perhaps the hardest group to gain support from, more so than Regional Council, public opinion has still been an important factor and therefore ranked higher with some of the participants.

The provincial *Places to Grow Act* was a very helpful rationale for GRT staff in arguing the need for rapid transit, said W1. Another significant motivator was the promise of provincial and federal funding for the capital portion of rapid transit, as noted by W3. Respondent W4 explained that the current focus on rapid transit can be traced to the success of the iXpress service, which was put in place when the Region won federal funding from the Urban Transportation Showcase Program. W1 provided additional interesting insight into the influence that the province has had over improving GRT service, which is indirectly related to the rapid transit project. In the late 1990s, the province was amalgamating a number of smaller municipalities (e.g. Ottawa, Hamilton). Leaders of the former Kitchener Transit and Cambridge Transit agencies knew that their respective cities would soon be amalgamated as well, so the agencies decided to form Grand River Transit. This has led better regional service and the ability to implement transit projects such as rapid transit.

Question 13: The following factors are sometimes thought to influence transit ridership. For each, please indicate the degree to which you believe it would have an impact on transit ridership in general (i.e. not specific to the city (region), then indicate whether you believe the factors will have a significant or insignificant impact specifically on Kingston (Waterloo) over the next 10 years. S = Significant; NS = Not Significant

Kingston Results

	Significance to City's Ridership			
	K1	K2	K3	K4
Population increase	NS	NS	NS	NS
Aging population	S	S	S	S
Greater preference for high density housing	S	S	S	S
Higher immigration levels	NS	S	NS	NS
Decreasing auto ownership	NS	S	S	S
Increase in average income	S	NS	NS	S

Figure 44: Question 13 interview results: significance of external factors for Kingston

This question reveals the perceived influence of a number of external factors on transit ridership in the future. These factors were included in interview question 13 because they related to some of the factors that were evaluated in this thesis, and the question helps reveal whether each municipality's decision makers evaluate these factors the same. After interviews were conducted, the set of factors was further refined to the seven that are presented in this thesis.

As mentioned above, all Kingston interview respondents deemed population increase insignificant to the city's transit ridership over the next 10 years.

All participants agreed that an aging population (a trend observed in many Canadian cities (Peck, 2010, p. 1)) would impact the city's ridership. They referred to Kingston as a retirement city and believe a growing retirement community represents a market opportunity for transit.

Greater preference for high density housing is also believed by respondents to be a significant factor in Kingston. K1 thinks of this factor in terms of “smart growth,” which is a term espoused by city councillors – and reflected in the new Official Plan – as the way they want the city to develop. By implementing the principles of smart growth, the City will help create a more compact, higher density urban form that changes the typical housing stock from suburban to mid- or high-density townhouses and apartments. This, it is thought, will encourage people to ride transit as amenities and services become more closely integrated. On the other hand, K3 points out that since most of Kingston is currently low density, this creates challenges for servicing efficiently many spread out suburban neighbourhoods. Therefore, if the City’s land use policies do not achieve greater densities, this scenario would be significant for transit ridership also.

Three participants believe immigration will be an insignificant factor over the next decade. The participants see most new Canadians moving into the large urban centres – Toronto, Montreal and Vancouver in particular. K3 mentioned some programs being put in place to help transition new immigrants and provide sensitivity training to KT staff; the impact of these programs on actual ridership will likely be low, however. K2 believes the immigration trend may be significant, but what is more important is where in the city the immigrants settle. If they tend to move into ethnically concentrated neighbourhoods, this has implications for Kingston Transit’s operations.

Three participants believe that a trend toward decreasing auto ownership will be significant to transit ridership in the city. While participant K3 recognizes that future trends in the auto industry are unknown, K3 believes that the public will increasingly recognize the environmental and financial challenges associated with car usage and ownership. Therefore, K3 believes this may present an opportunity for the transit agency to market its services to those people who seek a cheaper or less polluting alternative. K1 takes a different view, pointing out that cars are becoming more affordable and more environmentally conscious, and people will still need vehicles to move around.

Participants were split between whether higher average incomes will figure prominently in the city over the next decade. K2 and K3 say that Kingston does not experience economic or population booms and busts that other cities do; it has steady growth. This lack of changes in people’s income likely will not have a big impact on their spending behaviours and hence on transit ridership. If, in fact, Kingston’s incomes rise dramatically, K4 thinks this could have a significant impact on transit because those people may use their car more frequently or buy another car.

Waterloo Results

	Significance to Region’s Ridership			
	W1	W2	W3	W4
Population increase	S	S	S	S
Aging population	S	S	NS	NS
Greater preference for high density housing	S	S	S	S
Higher immigration levels	S	S	S maybe	Not sure
Decreasing auto ownership	S	S	NS	NS
Increase in average income	S	S	S maybe	S

Kingston Results

	Significance to City’s Ridership			
	K1	K2	K3	K4
Population increase	NS	NS	NS	NS
Aging population	S	S	S	S
Greater preference for high density housing	S	S	S	S
Higher immigration levels	NS	S	NS	NS
Decreasing auto ownership	NS	S	S	S
Increase in average income	S	NS	NS	S

Figure 45: Question 13 interview results: significance of external factors for Waterloo

Unlike Kingston respondents, Waterloo respondents believe population increase will be a significant influence on ridership over the next 10 years. They reference the forecasted increase of over 200,000 people between 2009 and 2031 as an important factor in their transit planning and the rationale for rapid transit. W2 says population increase has always driven the region’s transit ridership growth.

Regarding aging population, respondents’ opinions were split. W1 believes this will be a significant factor in the region due to the sheer number of seniors, but the impact could be positive for ridership or negative. W1 reasons that, while it is argued seniors are a demographic that frequents transit, seniors are also living longer and more active lives, which allows them to

be independently mobile (i.e. drive) well into their senior years. Furthermore, retired people do not need to make trips as frequently as adults still in the workforce, so the number of trips taken by transit or otherwise is lower. W2 believes this factor will be significant because, while seniors (especially the baby boomer generation, which is particularly accustomed to driving) may not use transit as much as some may argue, the sheer size of the senior population over the near future will be a challenge in terms of convincing them to ride the bus and servicing their needs. W3, on the other hand, thinks that perhaps the region will not experience significant aging demographics as much as other cities since the region attracts a young, upwardly mobile group of people rather than people who will age in place. W4 echoes the comments of W1 – that older people tend to make fewer trips – and therefore believes an aging population would not have a big impact on ridership.

Greater preference for high density housing is deemed to be significant. W1 is seeing a trend toward high rise apartments. W3 and W4 think high density living may appeal to young people and empty nesters with the caveats that it is combined with mixed use communities and good quality transit.

Two participants think higher immigration levels can be significant to the region's ridership, while two are not certain of the potential impact. W1 says there are many new Canadians who move to the city and use transit as their primary transportation. Additionally, these people often have multi-generational households (e.g. grandparents, their children and their grandchildren), which establishes two transit-supportive criteria: higher residential densities and target demographics for transit. Respondent W2 had done population forecasting several years ago and saw that immigration comprised an important part of the region's population increase, so W2 believes that immigration can be significant from the perspective that more people can mean more bus riders. Others are unaware of specific immigration numbers to be able to comment.

Decreasing auto ownership may or may not be a significant factor according to the interview participants. W1 says that this factor can be tied to high density housing: if more people move into downtown apartments that offer no parking, then the residents will find other modes of travel. W2 thinks this factor can be significant from the standpoint of transit having to compete with other alternative modes, such as walking and cycling, if in fact there is a trend toward fewer

car purchases. W4 does not see a trend of decreasing auto ownership in the region over the next decade.

The factor of higher household income is generally seen as significant by the participants. W3 believes that what will be more important than people's earnings is the quality of transit service and design of the urban form. If those make transit attractive, people may choose transit out of convenience and cost savings. W2 agrees with the importance of making transit competitive with the car. W1 thinks that because the region is relatively affluent, GRT must ensure it is perceived as a good travel option not just for low income people, as it traditionally has been.

Appendix 4: Detailed Presentation of Survey Results

The following tables summarize the most relevant survey responses. These responses are paraphrased. These responses are referred to under staff awareness within in each external factor.

KINGSTON COUNCILLORS					
SURVEY QUESTIONS		PARAPHRASED RESPONSES			
		KC1	KC2	KC3	KC4
Q.1 Years worked as Kingston councillor		3	4	6.5	6.5
Q.2 Years lived in Kingston		21	16	54	54
Q.3 3 terms to describe:	a. City's demographic makeup	<ul style="list-style-type: none"> - Both rich and poor income extremes - Predominantly Caucasian - Older age groups 	<ul style="list-style-type: none"> - Many retirees relocating from GTA - Many low income - Most young graduates move away due to limited job opportunities 	<ul style="list-style-type: none"> - Large retirement population - Well educated - Not ethnically diverse but making headway 	<ul style="list-style-type: none"> - Older, established and retired age groups - Many students - Average incomes (not very rich or very poor)
	b. City's economy	<ul style="list-style-type: none"> - Service industry - Growing economy - Tourism element 	<ul style="list-style-type: none"> - Mostly government and institutional jobs - Lots of retail - Little manufacturing - Lower per capita income than Ontario average 	<ul style="list-style-type: none"> - Strong institutional and government sectors - Strong service sector - Weak manufacturing sector 	<ul style="list-style-type: none"> - Strong institutional base and service sector - Limited manufacturing

KINGSTON COUNCILLORS

SURVEY QUESTIONS		PARAPHRASED RESPONSES			
		KC1	KC2	KC3	KC4
	c. City's transportation system	<ul style="list-style-type: none"> - Car-dominated - Cyclist and pedestrian unfriendly 	<ul style="list-style-type: none"> - Good in downtown - Very poor service in west end - We have Princess St and Montreal St express routes 	<ul style="list-style-type: none"> - Centrally located between Toronto, Montreal, Ottawa and Syracuse - Many options – car, bus, train, plane - Convenient local travel due to road connections and low congestion - Public transit seen as 	<ul style="list-style-type: none"> - Needs improvement - Natural limitations to improving transit system
				option for students and those who can't afford a car; not an option for commuters due to long bus travel times	
Q.4 Identify 5 major changes in City in past 10 years and impact it's had on transit ridership – strong/weak positive, strong/weak negative, no impact	<ol style="list-style-type: none"> 1. Better bus service – weak positive 2. Rack and roll (bike racks) – weak positive 3. Wheelchair accessible – weak positive 4. Trip planner - not yet well enough known – weak positive 5. Smaller buses on some routes – no impact 	<ol style="list-style-type: none"> 1. Residential growth in west end – strong positive IF transit trip is <1 hour to downtown 2. Invista Centre (hockey rinks) and soon new aquatic centre – strong positive 3. Downtown K-Rock Centre – strong positive, avoids parking problems 4. Hospital expansions – strong positive but need better transit from west end; parking availability issues at Queen's and KGH 5. Queen's expansions – strong positive with same 	<ol style="list-style-type: none"> 1. More students at Queen's, SLC, RMS – strong positive 2. Less affluence for some – weak positive 3. More affluence for some – weak negative 4. Environmental concern – weak positive 5. Moderate population increases and job growth – weak positive 	<ol style="list-style-type: none"> 1. Big box shopping centres – strong negative 2. More students at 3 post-secondary campuses – strong positive 3. Downtown has remained strong – strong positive 4. Growth in west end – weak negative 5. Growth in east end – no impact 	

KINGSTON COUNCILLORS

SURVEY QUESTIONS		PARAPHRASED RESPONSES			
		KC1	KC2	KC3	KC4
			caveats as #4; seeing more students with cars		
Q.5 Top 3 concerns among:	a. residents	<ul style="list-style-type: none"> - Frequency - Rudeness of drivers 	<ul style="list-style-type: none"> - Long travel time from west end to downtown - Bus transfer schedule not well synchronized, adding waiting time 	<ul style="list-style-type: none"> - Hardly hear anything from residents - Occasionally about long travel times and hard to make transfers 	<ul style="list-style-type: none"> - Not frequent enough - Not reliable - Temp. service stoppage on lower Princess St
	b. students	<ul style="list-style-type: none"> - Inconvenient routes - Travel time - Discomfort riding with strange people - Bus passes stops even when not full 	<ul style="list-style-type: none"> - None 		
	c. business owners	<ul style="list-style-type: none"> - Cannot think of any 	<ul style="list-style-type: none"> - None 		
Q.6 Desired elements in transport-ation system according to:	a. residents	<ul style="list-style-type: none"> - More direct routes to reduce in-vehicle time 	<ul style="list-style-type: none"> - Express routes from west end to reduce travel time to downtown 		<ul style="list-style-type: none"> - Higher frequency, somewhat more area coverage
	b. students	<ul style="list-style-type: none"> - More frequent, faster, direct service 	<ul style="list-style-type: none"> - They are ok, I hear no complaints 		
	c. business owners		<ul style="list-style-type: none"> - None 	<ul style="list-style-type: none"> - Reduced monthly passes for their employees 	
Q.7 Reason for undertaking network redesign project at this point in time		<ul style="list-style-type: none"> - Commitment of councillors to improve transit system because (1) environmentally good, (2) helps low income people, (3) peak oil may lead to greater transit demand so start building it now 	<ul style="list-style-type: none"> - Need to increase bus ridership (catch 22, need to expand bus service) 	<ul style="list-style-type: none"> - Routes don't promote growth in transit use - Express routes needed - Compared to car's convenience, transit has long way to go 	<ul style="list-style-type: none"> - Routes not rationalized - Need high speed (express) routes

KINGSTON COUNCILLORS

SURVEY QUESTIONS		PARAPHRASED RESPONSES			
		KC1	KC2	KC3	KC4
Q.8 Number of councillors (out of 13) you think are supportive of network redesign project and ongoing transit funding		<ul style="list-style-type: none"> - 2-3 core committed - 2-3 ok with idea - 2-3 don't see the need/don't want to spend - 2-3 believe city will always be car-dominated – people won't switch habits 	<ul style="list-style-type: none"> - I think all of us 	<ul style="list-style-type: none"> - All 13 	<ul style="list-style-type: none"> - 13
Q.10 Long-term goals for Kingston:	a. generally	<ul style="list-style-type: none"> - Reliable, efficient transit that employees of major employers can use and that gets people to key places in timely way 	<ul style="list-style-type: none"> - Downtown needs a parking garage 	<ul style="list-style-type: none"> - For prosperity, Kingston must work to attract jobs, investment and new citizens to remain relevant and competitive 	<ul style="list-style-type: none"> - Increase ridership - Increase service on densely populated routes - Dependability - Frequency
	b. for the transportation system	<ul style="list-style-type: none"> - Less reliance on cars - Much more pedestrian-friendly (connected sidewalks, lighting, etc.) - Cycling amenities (parking, showers, etc.) - Bus shuttles for events if needed - Bus service to natural areas on weekends and holidays 	<ul style="list-style-type: none"> - Express routes from west end to Kingston Centre and downtown – only stops at K Centre, KGH, Hotel Dieu and downtown 	<ul style="list-style-type: none"> - Increase ridership by providing more convenient and reliable service while keeping costs to tax base reasonable, recognizing necessary increase in tax base contributions from typical historical levels 	<ul style="list-style-type: none"> - Add more high speed/express routes

KINGSTON COUNCILLORS

SURVEY QUESTIONS	PARAPHRASED RESPONSES			
	KC1	KC2	KC3	KC4
Other comments?				<ul style="list-style-type: none"> - Increasing ridership from 4% to 11% as per KTMP is laudable but not realistically attainable - Kingston is smallish medium size city - One of its attributes, popular among residents, is travel times of only 15 min by car anywhere - Transit is not for everyone for many valid reasons

WATERLOO COUNCILLORS

SURVEY QUESTIONS		PARAPHRASED RESPONSES				
		WC1	WC2	WC3	WC4	WC5
Q.1 Years worked as Wloo councillor		16	10	28	20	13
Q.2 Years lived in Wloo Region		59	45	Whole life	60+	68
Q.3 3 terms to describe:	a. Region's demographic makeup	<ul style="list-style-type: none"> - Diversity in ethnicity and social economic status - Major new Canadian settlement area - Aging 	<ul style="list-style-type: none"> - Post-secondary students - Seniors who are sometimes homebound - Primarily young, upwardly mobile families 	<ul style="list-style-type: none"> - International 	<ul style="list-style-type: none"> - Ethnically diverse - Relatively young - Well educated 	<ul style="list-style-type: none"> - Regional system is much better than Old County System - Transit system has moved forward since Region took it over in 2000
	b. Region's economy	<ul style="list-style-type: none"> - Integrated - High tech - Educational excellence 	<ul style="list-style-type: none"> - Growing and prosperous - Industrious, based on its industry – tech, agriculture 	<ul style="list-style-type: none"> - Good 	<ul style="list-style-type: none"> - Dynamic, innovative - Healthy in spite of current level of unemployment 	<ul style="list-style-type: none"> - Always a challenge but ahead of any other area
	c. Region's transportation system	<ul style="list-style-type: none"> - Car dependent - Modal shift to transit - Evolving 	<ul style="list-style-type: none"> - Auto-dependent - Augmented with transit for students and those unable to afford car - Functions well 	<ul style="list-style-type: none"> - Needs money 	<ul style="list-style-type: none"> - Growing - Commute times still too long - Modern equipment 	<ul style="list-style-type: none"> - Always changing for the better (more transit area coverage and encouraging less car use)
Q.4 Identify 5 major changes in Region in past 10 years and impact it's had on transit ridership		<ol style="list-style-type: none"> 1. RGMS – strong positive 2. Places to Grow – strong positive 3. High tech boom (want their cars) – weak negative 4. Manufacturing decline (recession) – 	<ol style="list-style-type: none"> 1. iXpress – strong positive 2. Mobility Plus – strong positive 3. Transit substations – strong positive 4. Fare increase – weak negative 5. Bike racks on buses 	<ol style="list-style-type: none"> 1. Merging of transit from cities to Region – strong positive 2. Style of buses – strong positive 3. More Sunday service – strong positive 4. Ticket price increase – weak positive 	<ol style="list-style-type: none"> 1. Merging of transit from cities to Region – strong positive 2. iXpress – weak positive 3. More routes – weak positive 4. New equipment – no impact 	<ol style="list-style-type: none"> 1. Merging of transit from cities to Region and affordability of transit – strong positive 2. New routes and better service – weak positive 3. Adding

WATERLOO COUNCILLORS

SURVEY QUESTIONS		PARAPHRASED RESPONSES				
		WC1	WC2	WC3	WC4	WC5
		weak positive 5. Transit investment – strong positive	– no impact	5. More routes – strong positive	5. Intensification from planning – weak positive	roundabouts – strong positive 4. Subsidizing seniors and student passes – strong positive 5. New equipment (buses, computer updates, etc.) – strong positive
Q.5 Top 3 concerns among:	a. residents	<ul style="list-style-type: none"> - Taxes - Environment - Roads 	<ul style="list-style-type: none"> - Too many transfers, too long to get to destination - Bus doesn't reach desired destinations - Old, noisy, uncomfortable buses 	<ul style="list-style-type: none"> - Numbers on buses 	<ul style="list-style-type: none"> - Travel time on bus too long - Indirect routes 	<ul style="list-style-type: none"> - Continue to improve service and scheduling
	b. students	<ul style="list-style-type: none"> - Transit - Environment - Housing 	<ul style="list-style-type: none"> - Long travel times - Infrequent service - Inefficient service 	<ul style="list-style-type: none"> - Late in arrival - Numbers on buses 	<ul style="list-style-type: none"> - Overcrowding on buses 	<ul style="list-style-type: none"> - Continue with subsidizing to keep costs in line
	c. business owners	<ul style="list-style-type: none"> - Taxes - Economy - Transportation 	<ul style="list-style-type: none"> - No comments 		<ul style="list-style-type: none"> - Routes not near their businesses 	<ul style="list-style-type: none"> - Marketing transit to more people
Q.6 Desired elements in transportation system according to:	a. residents	<ul style="list-style-type: none"> - Roads 	<ul style="list-style-type: none"> - More iXpress type service 	<ul style="list-style-type: none"> - More routes 	<ul style="list-style-type: none"> - More frequent service 	<ul style="list-style-type: none"> - Same as above
	b. students	<ul style="list-style-type: none"> - Transit 	<ul style="list-style-type: none"> - Same as above for residents 			<ul style="list-style-type: none"> - Same as above
	c. business owners	<ul style="list-style-type: none"> - Roads 	<ul style="list-style-type: none"> - No comments 			<ul style="list-style-type: none"> - Same as above

WATERLOO COUNCILLORS

SURVEY QUESTIONS		PARAPHRASED RESPONSES				
		WC1	WC2	WC3	WC4	WC5
Q.7 Reason for undertaking RT project at this point in time		<ul style="list-style-type: none"> - RGMS/P2G – need to prepare for next 250,000 people with only half to live in greenfields - Other half in intensified areas facilitated by RT 	<ul style="list-style-type: none"> - RGMS - New ROP - Interested residents must attend Council meetings to demand more transit 	<ul style="list-style-type: none"> - If not undertaken, have to build 500 miles of roads (26 new roads) 	<ul style="list-style-type: none"> - To encourage corridor intensification - Fed/prov funding - Interest in environment - Easier to develop now rather than 20 years from now 	<ul style="list-style-type: none"> - Region's abandoned trolley system from '50s should have been expanded - Cannot add more roads
Q.8 Number of councillors (out of 16) you think are supportive of RT project and ongoing transit funding		<ul style="list-style-type: none"> - 16 	<ul style="list-style-type: none"> - 90% support RT - 50% support ongoing transit funding 	<ul style="list-style-type: none"> - All of council, but Cambridge councillors want LRT before 2031 	<ul style="list-style-type: none"> - 13 	<ul style="list-style-type: none"> - 90% plus
Q.10 Long-term goals for Waterloo Region:	a. generally	<ul style="list-style-type: none"> - Balanced approach between roads and transit as per RGMS 	<ul style="list-style-type: none"> - Compact urban form promoting walkability - Healthy community with diversity, art, heritage, clean environment and multi-modal transportation system 	<ul style="list-style-type: none"> - Encourage more people to use transit 	<ul style="list-style-type: none"> - Environmentally friendly community that prospers economically through innovation 	<ul style="list-style-type: none"> - Continual improvement of transit system
	b. for the transportation system	<ul style="list-style-type: none"> - LRT and integrated bus system - Road retrofits or expansions to underserved areas 	<ul style="list-style-type: none"> - Many choices - Offers equality in time and space - Car less dominant than today - Transit, cycling, modern buses 	<ul style="list-style-type: none"> - All areas of region (cities, townships) have public transit 	<ul style="list-style-type: none"> - Convenient and frequent transit system - LRT 	

Appendix 5: Discussion on Rational Choice Theory and Relative Importance of Internal vs. External Factors

People's Travel Choices as a Function of Rational Choice Theory

Rational choice theory explains this choice as the result of the thought process people use to make logical decisions, at least as they perceive what is logical. The theory suggests that people make purchase decisions based on maximizing their personal utility – increasing benefits or minimizing costs. In commuter decisions, the “relevant attribute that defines utility for most commuters is travel time... commuter decisions are influenced by time considerations with individuals preferring the option that is least costly in terms of average travel time” (Van Vugt, Van Lange & Meertens, 1996, p. 375). Other factors that influence a commuter’s travel mode decision may be quite variable and conspicuous, such as gas prices, or they can be static and inconspicuous, such as community land use designs.

Taking a broader view on factors affecting travel mode choice, in the United States, for example, widespread vehicle ownership, extensive highway systems and relatively inexpensive air travel have contributed to a decline in bus and passenger rail systems (Morgan, Sperry, Warner, Protopapas, Borowiec, Higgins & Carlson, 2010, p. 192). In Canada, this list could also include cheap fuel, the lack of road tolls and a large, sparsely populated geographic area.

Internal vs. External: Which is More Important?

Report 111 notes that it is difficult to isolate the impact of any one factor on ridership, and even to determine whether a set of external factors has more influence than that of internal factors, or those that are within a municipality’s control to manage, change or otherwise affect. Based on a TCRP report for which senior staff at 27 transit agencies were interviewed, external forces outside the control of transit planners, managers and policy makers “may have a greater impact on ridership than any combination of traditional fare, marketing, service design, or operational initiatives” (TCRP 111, 2007, p. 7).

A follow-up TCRP report, again based on informant interviews at 42 agencies, confirms that “external forces continue to have a potentially greater effect on ridership than system and service design initiatives” (TCRP 111, 2007, p. 7). The report explains the usefulness of identifying external factors: “while an agency may not be able to explicitly control these external factors, it can monitor them, anticipate their potential impact on transit demand, and take actions to mitigate—or take advantage of—them” (TCRP 111, 2007, p. 6).

Another study summarized in TCRP Report 111 is that of the Mineta Transportation Institute. This study presents a comprehensive review of the influence of external and internal factors on ridership in 103 U.S. systems. The external factors – especially unemployment rate, real hourly wage and real GDP – were consistently found to be the most significant factors influencing transit use (TCRP 111, 2007, p. 11). However, there were strong correlations found between ridership and the internal factors tested – average fare and service provided (revenue vehicle miles and revenue vehicle miles per capita).

A 2008 study (Taylor, Miller, Iseki & Fink, 2008, p. 15) quantified the percentages of influence of each set of factors. It found that external factors – those outside the control of the public transit systems – accounted for 74% of the variance in ridership among 256 U.S. urbanized areas. These factors were regional geography (area of urbanization, population, population density, and regional location in the U.S.), household income, population characteristics (percent college students, recent immigrants, and Democratic voters in the population), and auto/highway system characteristics. Internal factors (service frequency and fare levels) accounted for 26% of the variance.

Based on this body of literature, external factors have a greater influence on whether people choose transit. However, it is also noted that internal factors can provide boosts in ridership and market share, especially when the services match diverse market needs (TCRP 111, 2007, p. 7). Therefore, it is prudent for agency staff to identify and be responsive to both internal and external factors.

Appendix 6: Further Information on Fuel Price Increases

Reasons for Gas Price Increases

Gas prices can increase in a small period of time for a number of reasons, as explained in Borzykowski (2010). In Montreal in June 2010, a Shell oil refinery was closed. This had a major impact on supply and, hence, prices in eastern Canada. The introduction of the Harmonized Sales Tax (HST) in July 2010 in Ontario also had the effect of increasing prices, not due to an impact on supply and demand but simply because the government tax on gas increased from 5% to 13%. Crude oil prices have increased, whether due to the increased cost of production or the lack of competitors to keep prices in check. A strong Canadian dollar can also keep gas prices high; the average Canadian exchange rate between February 2010 and February 2011 was CAD\$1.03 per USD\$1.00. There are also one-off events such as hurricanes and oil spills that can affect the price. Often times, the explanation for price fluctuations is unknown. What is known is that, according to gas price watchdog and Ontario MP Dan McTeague, “permanent high prices will be here for a very long time” (Borzykowski, 2010).

At the same time that gas prices have climbed sharply over the past 10 or so years, the number of vehicle kilometres travelled (VKT) by passenger car has risen. Using 2002 as the base year (due to data availability), Figure 46 shows the percentage changes in VKT and in transit ridership in Ontario. Year 2003 shows negative growth in both VKT and ridership, which both then increase steadily until year 2006 where the two lines diverge. In 2007 and 2008, the VKT level is just above the base year’s level, while ridership increases by 14-16% from the base year. This could possibly be because of sharply increased gas prices and the global economic recession, which both occurred around 2008. Ontarians constrained their driving (whether due to losing their job or not) and increased transit usage. However, the province began to experience economic recovery in 2009, and the right ends of the trend lines show a slight decrease in ridership and slight increase in driving, despite persistently high gas prices. While data is not yet available, it will be interesting to see whether ridership continues to decrease as a result of people getting back into their cars as the economy improves, particularly at the same time that gas prices show no sign of decreasing.

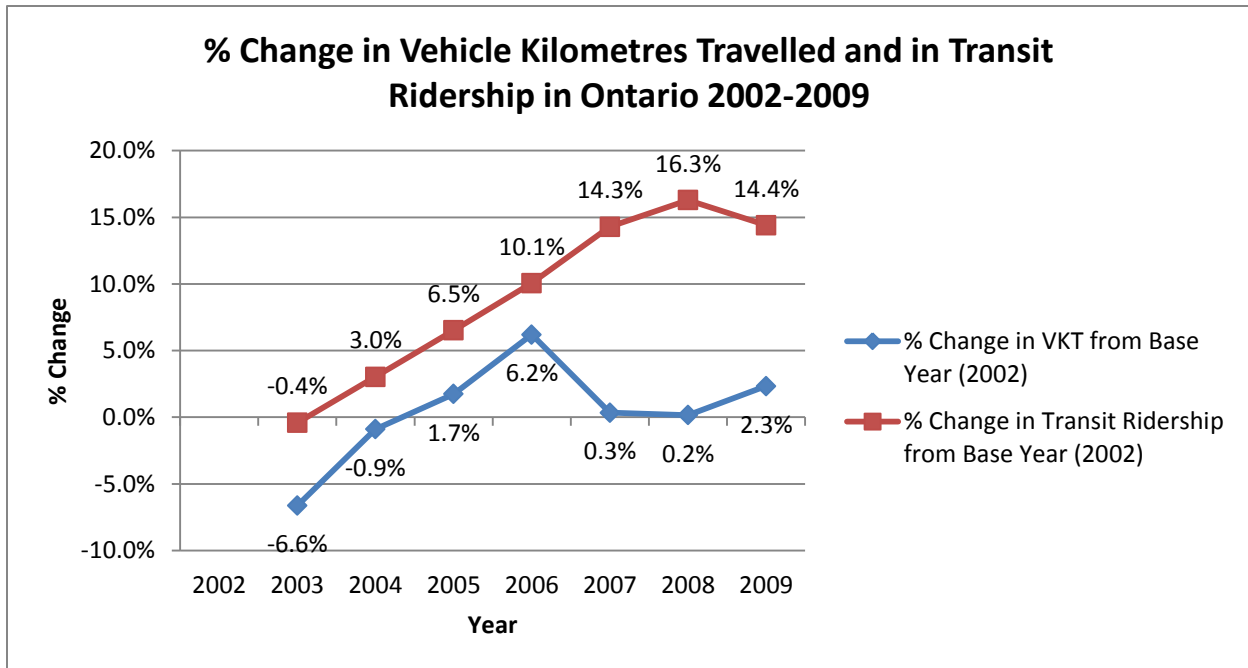


Figure 46: Percent change in VKT and transit ridership in Ontario, 2002-2009. Statistical sources: <http://dsp-psd.pwgsc.gc.ca/Collection/Statcan/53-223-X/53-223-XIE.html> and CUTA/MTO Ontario Urban Transit Fact Books

In terms of automobile use, the VKT chart shows increasing kilometres driven in the early 2000s, then a decrease during 2007 and 2008, and the start of an upswing in 2009. There can be many reasons for the continued high car use, such as the availability of transit in one's city, holding a job that requires frequent travel or having other travel needs such as taking children to school. At a macro level, however, three phenomena are introduced that can help explain why transit travel is not utilized on a large scale.

One possible explanation for people continuing to drive despite higher gas prices is rational choice theory. This theory suggests that people make purchase decisions based on maximizing their personal utility – increasing benefits or minimizing costs. In commuter decisions, the “relevant attribute that defines utility for most commuters is travel time... commuter decisions are influenced by time considerations with individuals preferring the option that is least costly in terms of average travel time” (Van Vugt et al., 1996, p. 375). Another important consideration in commuter travel decisions is reliability; perhaps the perception of private automobile being a more reliable transport mode plays into the decision making process as well.

Purchasing power may be another reason why people continue to drive at high rates rather than switch en masse to alternate forms of transportation. While gas prices have increased, people's disposable incomes have increased more quickly than the price of gasoline – in effect, gas has gotten cheaper for the average consumer (Figure 47). This typically occurs during periods of economic growth since, understandably, companies are doing well and may provide higher wage increases (or increases at all). During recessions, however, gas sales decrease because purchasing power is reduced. This can be seen during the 1980s on Figure 47. The combination of a drop in disposable income and a rise in gasoline prices during the early 1980s explains the reduced gasoline purchasing power in Canada (Frigon, 2007, p. 5). The Canadian economy recently lifted out of the 2008 recession, so transit ridership may be negatively impacted as people return to using their cars.

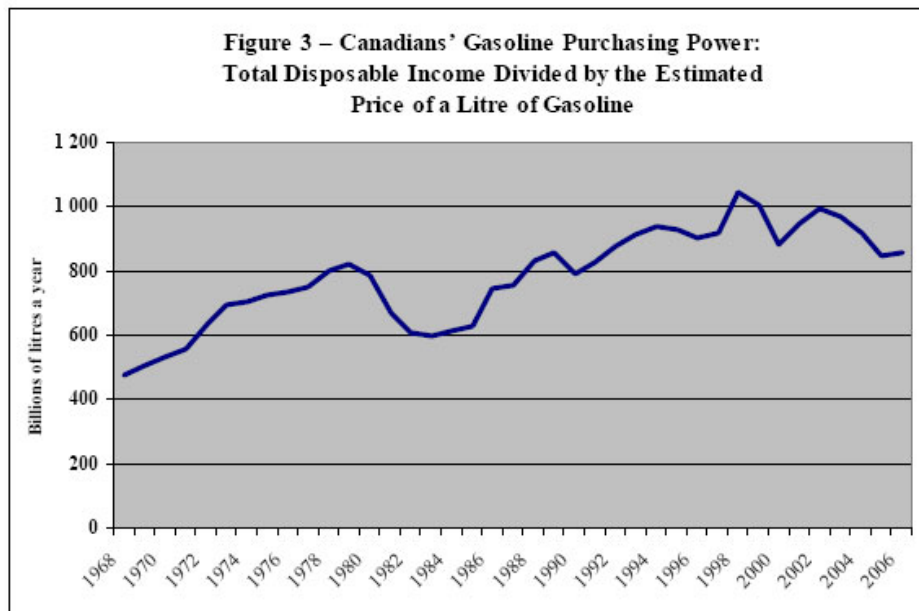


Figure 47: Change in Canadian consumers' gasoline purchasing power 1968-2006. Source: <http://www2.parl.gc.ca/Content/LOP/ResearchPublications/prb0755-e.htm>

A third explanation for Canada's continued high rates of car use could be fuel tax. As seen in Figure 48, Canada has very low fuel tax compared to other western countries, at 70¢/litre. Low fuel tax can be a hindrance to municipal transit planners as they try to increase ridership or discourage driving.

Figure 1 2006 Transport Fuel Prices (International Fuel Prices 2007)

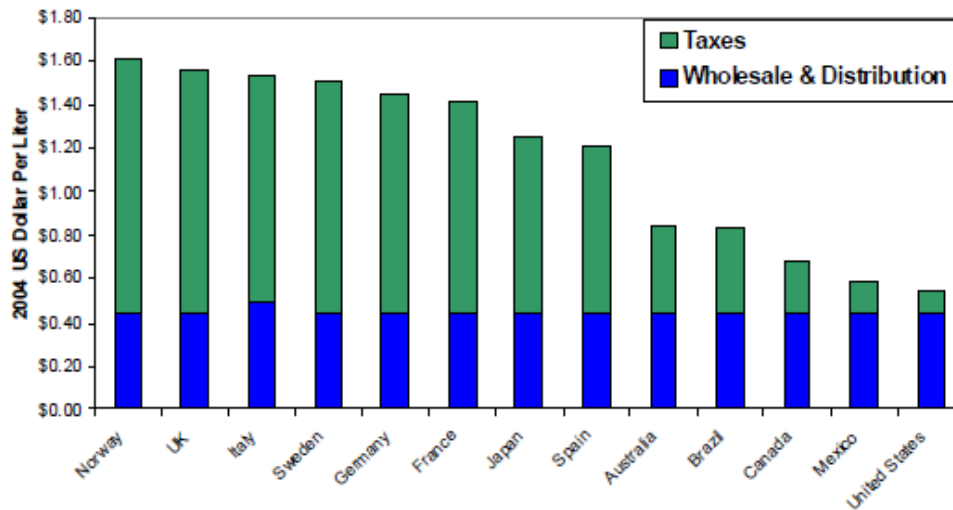


Figure 48: Fuel taxes for selected countries 2006. Source: <http://www.vtpi.org/fuelprice.pdf>

Ridership and driving, therefore, may be more closely related to other variances. For example, driving rates decreased at the same time as Canada’s economic recession, and is showing signs of increasing again while the economy recovers. Perhaps driving rates and ridership are less related to fuel prices and more closely tied to other “push” variables that push people away from their cars. These variables, and external factors related to them, were presented above and can be summarized as: increasingly congested roads (rational choice theory of other drivers), decreased purchasing power for gasoline (economic recession), and higher fuel taxes (subject to government policies). This would also help to conclude that ridership is more affected by external “push” factors and less affected by internal “pull” factors that pull people toward using transit.

Appendix 7: Transit-Related Policies in Kingston and Waterloo Official Plans

The following tables present the transit-related policies of Kingston’s provincially approved Official Plan (2010) and Waterloo Region’s provincially-approved (but under appeal) Regional Official Plan (2011). The tables show the search results of the word “transit” in each OP; actual policies are included whereas introductory text, definitions and maps that use the word “transit” are not.

Kingston Official Plan – Transit-Related Policies		
Policy Number	Policy Section Heading	Paraphrase of Policy
Section 1: Overview		
<i>No policies that mention transit</i>		
Section 2: Strategic Policy Direction		
2.1.2(b)	General Sustainable Development	Most growth will occur in urban boundary and will be directed to achieve land use patterns that foster transit and pedestrian activity
2.1.6(a)(b)	Secondary Plans & Evaluation Reports	For future development areas, transit supportive densities and road design that promotes transit are promoted
2.1.7(d)	Development Review	Consider transit when reviewing development apps
2.1.8(d)	City Initiatives	The city will lead by example by creating streetscape design that coordinates movement of transit, cyclists, pedestrians
2.2.5	Housing Districts	Existing stable residential areas if redeveloped should have higher density near transit routes
2.2.10	Corridor	Princess St is priority transit route
2.3.3	Centres and Corridors	Major development directed to compact mixed use areas to support transit
2.3.5	New Areas and New Development	Increase residential development to promote transit
2.3.9	Transportation	Promote transit and active transportation as under the TMP
2.4.1(c)	Vision (Phasing of Growth)	Support compact mixed use urban area that support transit
2.4.3(b)(c)	Residential Density Targets	Increase large scale residential and greenfield density to minimum 37.5 units/ha and developments on Princess St to min 75 units/ha to be transit supportive
2.5.10	Strategic Direction to	TMP calls for infrastructure provision to encourage transit, walking and cycling before

Kingston Official Plan – Transit-Related Policies		
Policy Number	Policy Section Heading	Paraphrase of Policy
	Promote Active Modes of Travel	providing new road infrastructure, even though the car will remain the primary mode
2.5.11	Transit Priority	Transit promoted through development of mixed use areas, corridors, centres, higher densities, infilling and brownfields
2.5.13	Shared Parking	City will work with major employers to promote shared parking, which should be next to transit
2.7.7(d)	Functional Needs	Builders will have to demonstrate that the development will make efficient use of municipal services, including transit
Section 3: Land Use Designations and Policy		
3.3.8	Intensification	Gradually intensified residential areas may be approved next to transit routes
3.3.B.4(c)	Locational Criteria (Medium Density Residential)	Proposal for new medium density residential projects must address whether it is on an arterial or collector road designed for transit
3.3.C.2(d)	Locational Criteria (High Density Residential)	Proposal for new high density residential projects must address whether it is on an arterial or collector road designed for transit
3.3.D.1	Senior Citizen Buildings	City encourages med-high density seniors homes that are close to transit routes
3.3.D.7(d)	Criteria for Corrections Residence	Good access to transit is required for a new corrections residence
3.4.1	Strategic Intent – Centres and Corridors	Development of Princess St corridor should support transit
3.4.11(a)	Transportation Study (Commercial Uses)	The study must demonstrate that transit access is integrated and encouraged on the site
3.4.17(h)	Site Plan Control	New commercial developments/expansions will be required to provide direct pedestrian access to transit routes and stations
3.4.B.4	Cataraqui Centre	The Cat Centre is intended to foster major office and high density residential that will support transit
3.4.C.8	Williamsville Main Street	This commercial area along Princess St will support the Princess St transit corridor
3.4.E.5	Princess St Corridor	Enhanced transit is intended to provide more intensive development and mixed uses
3.4.E.6	Transportation Demand Management	TDM measures along the Princess St corridor may be used to encourage transit ridership
3.5.9(c)	OP Amendments	Availability of transit routes to serve a new institutional site is an approval criteria

Kingston Official Plan – Transit-Related Policies		
Policy Number	Policy Section Heading	Paraphrase of Policy
3.6.14(e)	Development Criteria (Employment Areas)	Employment areas development must accommodate transit
3.7.3(b)	Architectural and Site Guidelines (Airport)	The city may develop design guidelines for development on the airport to consider location of high employment density uses in relation to transit routes
3.7.13	Intermodal Connections	Transit routes serving the airport must connect effectively with the overall transit system to improve intermodal connections with rail and intercity bus
3.18.18(a)	Site Specific Policy for Division St between Dalton Ave and CNR rail line	Redevelopment of property must consider transit movement through the property
3.18.21(a)	Site Specific Policy for Dalton Ave/Warne Crescent	Development of property must consider transit movement through the property
Section 4: Infrastructure and Transportation		
4.6.1	Strategic Direction	Transit, cycling and walking will be encouraged before expanding road infrastructure
4.6.2	Transportation Demand Management	TDM promotes the strategic direction of TDM by increasing transit use
4.6.3	Pedestrian Facilities	Construction/reconstruction of roads will include enhancement of transit facilities to assist in mobility for physically challenged
4.6.5	Improved Connections	Walkways will be designed to give neighbourhood interiors direct access to bus stops
4.6.6	Pedestrian Friendly Streetscapes	City supports development of streetscapes that include convenient transit stops
4.6.10	Walking, Cycling and Transit – Intermodal Improvements	Weather protection for transit users, and other transit amenities, will be encouraged
4.6.12	Supports for Cycling	City supports integration of cycling and transit
4.6.13	Intermodal Coordination	Inter-modal transportation is encouraged through the integration of rail, inter-city bus, taxi, transit and active modes of transportation
4.6.14	Transit	Increased transit use is supported by providing full-service, accessible, high frequency peak period transit

Kingston Official Plan – Transit-Related Policies		
Policy Number	Policy Section Heading	Paraphrase of Policy
4.6.18(d)	Road Widening	Road widenings, apart from those contained in the OP, may be allowed for transit priority lanes
4.6.34	Level of Service	A high level of service for the city's transportation system will be provided in part through adequate maintenance of sidewalks, buses and traffic signals
4.6.37	Transit Service	Maintenance and expansion of the transit system within the Urban Boundary is supported
4.6.38	Transit Service	Specific means of encouraging transit use include: thoughtful location of high intensity land uses; designing roads to accommodate buses; appropriate bus stop infrastructure (shelters, benches, transfer points); and planning bus stops within 300 metres of major activity centres and 95% of urban residences
4.6.39	Bus Service	The city will work with private bus passenger carriers to ensure optimal relocation or expansion of bus terminal facilities
4.6.47	Parking	The OP will encourage balance between parking supply and oversupply to the detriment of transit usage
4.6.52(d)	Cash-in-Lieu and Alternative Provisions	The city will generally require off-street parking but in certain circumstances will permit shared/reduced parking for buildings close to transit, supportive of transit and requiring less parking
Section 5: Protection of Health and Safety		
5.24	Road Noise	Any development within 500 m of a future transit right of way requires a noise study
Section 6: The Environment and Energy		
<i>No policies that mention transit</i>		
Section 7: Cultural Heritage Resources		
<i>No policies that mention transit</i>		
Section 8: Urban Design		
<i>No policies that mention transit</i>		
Section 9: Administration and Implementation		
9.5.25(d)	Height and Density Bonus	City may approve increase in height or density beyond zoning bylaw in return for improving access to public transit facilities
9.5.32(d)	Site Plan Control	City will use site plan review process to enhance accessibility to services such as transit
9.6.4(b)	Applicable Policies (Land Division)	Plans of subdivision must integrate with transit and the broader transportation system
Secondary Plans/Special Policy Areas: 10A Downtown and Harbour; 10B Rideau Community; 10C Cataraqui North; 10D Cataraqui West		

Kingston Official Plan – Transit-Related Policies		
Policy Number	Policy Section Heading	Paraphrase of Policy
Include policies to promote transit use		

Waterloo Regional Official Plan – Transit-Related Policies		
Policy Number	Policy Section Heading	Paraphrase of Policy
Chapter 1: Introduction to the Regional Official Plan		
<i>No policies that mention transit</i>		
Chapter 2: Shaping Waterloo Region’s Urban Communities		
2.C.3(c)	Reurbanization Target	Use implementation of target in AMs to establish minimum density targets for reurbanization areas consistent with existing or planned transit service levels
2.D.1(c)	General Development Policies	Region or AMs will ensure development contributes to complete communities that support transit
2.D.2	Transit Oriented Development Policies	Region and AMs will apply the following TOD provisions in reviewing development applications or site plans for areas near rapid transit: multimodal street pattern supporting transit; compact form that locates transit supportive uses within walking distance of a stop or transit station area; provides mixed uses with food destination, services and amenities that foster transit supportive neighbourhoods; promote medium/high density close to transit stop; foster walkability; support high quality public realm; provide access from other transportation modes to transit facility
2.D.3(c)	Urban Growth Centres	Region’s primary business, commercial, civic and cultural centres will accommodate major transit station areas
2.D.5(a)	Urban Growth Centres	Region and AMs will support infrastructure investments in the transit system
2.D.6	Major Transit Station Areas	These areas, 600-800 m radius from transit station, are designated in Map 3a and will be developed to increase density and have mixed land uses
2.D.7	Major Transit Station Areas	AMs will prepare plan for each MTSA outside an urban growth area, and the plans will include comprehensive land use plan, minimum density requirements, design guidelines, parking management strategy and future actions required to implement the plan, such as financial

Waterloo Regional Official Plan – Transit-Related Policies

Policy Number	Policy Section Heading	Paraphrase of Policy
		incentives
2.D.8	Major Transit Station Areas	AMs will designate MTSA in their official plans
2.D.9	Major Transit Station Areas	Existing developments in MTSA that do not meet MTSA policies will be encouraged to redevelop in a way to be consistent. AMs are encouraged to have flexible zoning, reduced parking requirements and other incentives to support TOD
2.D.10	Major Transit Station Areas	Until AMs have MTSA policies in their OPs, development applications will be reviewed in accordance with TOD policies in 2.D.2. Non-compliant applications may be approved if subsequent phasing or infilling will meet TOD provisions
2.D.11	Reurbanization Corridors	These corridors are linked directly to RT, will be higher density, will accommodate more people and jobs, will be mixed use and will facilitate movement among urban growth centres, MTSA and major local nodes
2.D.12	Reurbanization Corridors	AMs will designate reurbanization corridors in their OPs and may designate additional local reurbanization corridors to accommodate additional growth consistent with existing/planned transit service levels
2.D.14	Major Local Nodes	These are clusters of development near or at key intersections of transit corridors, and will be developed to accommodate more people and/or jobs consistent with transit service levels
2.D.17(c), (d), (e), (f)	Urban Designated Greenfield Areas	AMs will ensure development in these greenfield areas include linkages to transit stops, support transit services, ensure road network design provides for direct and efficient transit routes within communities, and locate land uses within 450 m of transit stop
2.D.19	Urban Designated Greenfield Areas	AMs will develop OP policies for greenfields to provide early introduction of transit services
2.D.28(c) (ii)	Special Policies for Urban Areas	Re: the Stockyards Industrial Area in Woolwich, proposals to increase range of commercial uses will require review of relationship between the stockyards and regional transit system
2.E.2(c)	Township Urban Growth Centres	These areas are on Maps 3b-3e and will be developed to support integration of future regional transit services
2.E.6(c)	Township Designated Greenfield Areas	AMs will ensure development in these greenfields will provide road network that supports future transit services
2.G.2(c)	Major Urban Greenlands	AMs will designate these greenlands and policies that facilitate transit access
2.G.4	Retail Commercial Centres	New retail commercial centres will be required to locate in MTSA

Waterloo Regional Official Plan – Transit-Related Policies

Policy Number	Policy Section Heading	Paraphrase of Policy
2.G.6(b)	Retail Commercial Centres	New retail commercial centres exceeding 42,000 m ² are only permitted in MTSAs, urban growth centres or major local nodes and must not adversely affect the function of a MTSA
2.G.7	Offices and Institutional Land Uses	Major offices should be located in MTSAs or the other identified areas
Chapter 3: Liveability in Waterloo Region		
3.A.10	Special Needs and Community Housing	AM policies may include locational criteria such as proximity of special needs housing to transit
3.B.3(g)	Walking and Cycling	AMs are encouraged to enhance walking and cycling by providing connection to transit stops
3.B.4	Walking and Cycling	The Region will support transit, walking and cycling through educational initiatives that address safety, health and environmental benefits, and comparative costs of auto and non-auto travel
3.C.1	Transportation Demand Management	The Region will implement a TDM program, including area-specific programs, employer programs and transit infrastructure
3.C.2	Transportation Demand Management	The Region will promote sustainable transportation including transit to regional employees
3.C.3	Transportation Demand Management	The Region will offer an incentive to owners who implement TDM strategies – granting reductions in road improvements that would otherwise be required for development
3.C.4	Transportation Demand Management	AMs are encouraged to provide reduced parking standards for development applications when the owner agrees to implement TDM strategies
3.D.1(b)	Energy Conservation	Region will support energy conservation through policies that promote transit
3.E.1	Air Quality	Region will support improved air quality through policies that support more compact, transit supportive urban form
3.H.2	Human Services	Region will locate Public Health and Social Service facilities and programs close to transit
Chapter 4: Supporting Waterloo Region's Business Community		
4.B.7	Planning and Managing Physical Infrastructure	Region will enhance transit service to key employment areas
Chapter 5: Addressing Waterloo Region's Infrastructure Needs		
5.A.3	Transportation Systems Planning	Region and AMs will require the following prior to approving development applications in order to support the transit system: dedicating land for RT stations, transit terminals/stops and transit rights-of-way; infrastructure such as shelters, pads, bike racks and energy efficient lighting; site plan designs that meet needs of transit users

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Policy Number	Policy Section Heading	Paraphrase of Policy
5.A.4	Transportation Systems Planning	Region and AMs will try to acquire abandoned rail corridors for possible use in transit, walking, cycling and utility corridors
5.A.6	Regional Transit System	The transit system will be improved on an ongoing basis through RT and Transit Business Plan
5.A.7	Regional Transit System	Region will partner with province to improve links between transit and GO Transit
5.A.8	Regional Transit System	AMs will adopt policies that apply TOD provisions for development along transit corridors, which are dedicated rights-of-way outside mixed traffic
5.A.9	Regional Transit System	Existing and planned transit corridors are designated on Map 5a
5.A.10	Regional Transit System	The CTC EA study area is designated on Map 3a and the final alignment for RT will be in an OP amendment
5.A.11	Regional Transit System	Region will implement transit priority measures such as reserved bus lanes and TSP where appropriate
5.A.12	Regional Transit System	AM parking strategies will support transit service levels and TOD where feasible
5.A.13	Regional Transit System	New rail terminals will be located to promote safe and convenient access to transit users, motorists, cyclists and walkers
5.A.17	Walking and Cycling Networks	Sidewalks will be provided on both sides of streets where transit service exists or is planned
5.A.22(a)	Road Network	The road network will support existing and planned transit corridors
5.A.25	Road Network	Where a development will generate significant traffic, a transportation impact study will be required to examine ways to encourage transit
5.A.27	Road Network	If a development may impact future transit corridor, the Region/AMs may consider the proposal premature until EA studies are completed
5.A.32(c)	Regional Road Design, Construction and Operation	Openings in a centre median for private access on regional roads will only be permitted where there are significant transit movements or auto trip generation
5.A.36(a)	Designated Regional Road Allowances	The Region may require road widenings in a development application to provide for transit and RT infrastructure, pedestrian facilities and bike lanes
Chapter 6: Supporting the Countryside		
<i>No policies that mention transit</i>		
Chapter 7: The Greenlands Network		
<i>No policies that mention transit</i>		

Waterloo Regional Official Plan – Transit-Related Policies

Policy Number	Policy Section Heading	Paraphrase of Policy
Chapter 8: Source Water Protection		
<i>No policies that mention transit</i>		
Chapter 9: Managing Aggregate Resources		
<i>No policies that mention transit</i>		
Chapter 10: Fulfilling Consultation and Implementation Roles		
10.B.6(c)	Community Improvement Plans	Region may adopt community improvement plans in relation to land and buildings within/adjacent to transit corridors that have potential for high density reurbanization
10.C.7(a)	Boundary Interpretation	MTSA boundaries in Map 3a are conceptual and will be delineated in AM OPs