

# LITERATURE REVIEW

# COMMUTER ANALYSIS AND BUSINESS CASE DEVELOPMENT PROJECT (COMMUTER STRATEGY)

# A project undertaken by

Eastern Ontario Leadership Council (EOLC)

with the support of the Ontario Ministry of Labour, Training and Skills Development

as at August 31, 2020





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# 1. Note to Reader: The Impact of COVID-19 on Research Findings

As the date on the cover indicates, this literature review was prepared before the full impact of the COVID-19 pandemic was felt, not just in Eastern Ontario, but across the province and indeed around the world. Bearing in mind the restrictions on mobility and interaction that have been brought to bear on the pandemic (with an expectation of reducing transmission and infected persons, the Commuter Strategy project team has prepared this preface to the Review to examine the degree to which the pandemic changes the value of the findings reported herein. It is expected that many of the factors mentioned throughout the literature will likely remain important to commuters' decisions (assuming they are permitted to travel to a workplace). Other factors may increase or decline in importance. The following highlights are offered as an additional resource to persons researching best practices in designing and operating commuter transportation services.

#### • Frequency of Service, Convenience and Flexibility Expected to Remain Important

Frequency, convenience and flexibility of services offered were all noted in the literature as factors affecting transit ridership. Our original findings suggest that a high number of days and times that the service is available, lack of advance reservation times, the type of service (specific preferences for on-demand response services), and shorter travel distances to access services, all contribute to increases in ridership.

With pandemic-related changes to work schedules and unpredictable commuter patterns, flexible, frequent and convenient modes of transportation are likely to have become even more important to commuters --- especially to essential service workers.

# • Speed and Trip Duration Will Be Important, Especially As a Strategy for Minimizing Interaction with Other Riders

The speed with which commuters can get from A to B, and the duration of the trip (previously mentioned as factors which affect commuter ridership), remain important. Shorter, simpler and more direct routes may be favoured by riders as a way to make social distancing easier. Fewer stops and shorter trips may be viewed as reducing interactions --- including possible physical contact --- with other riders and the total number of persons using the service.

# • Affordability and Accessibility Will Remain Paramount During Unsettling Economic Times

The importance of accessibility, not only in terms of physical accessibility but also affordability, was identified throughout the literature as key to transit ridership. For example, the literature noted that lack of car ownership and commuter services which fill a void in existing services (where transit does not exist) were contributing factors towards commuters utilizing public transit services. There is a wide range of transportation service characteristics



that shape riders' perceptions of affordability and accessibility: modes of public transportation with rates lower than taxi rates; rates which take into account the price-sensitivity of low income users; services which include multi-use fares (such as one-time use/ per trip fare) or frequent use (multi-pass) fares; and services which were cheaper than owning a vehicle and/or paying for parking.

With the changing nature of employment (and potentially disposable/ household income) during COVID-19, affordable fares could become an increasing issue for many users, including but not limited to, commuters with low incomes. Recent literature notes that during pandemics, low-income and historically marginalized groups are not only the most susceptible to economic shifts but are also most reliant on public transportation (Wilbur et al., 2020).

# • Concern for Safety and Security Will Persist and Take on New Meaning

As noted by the literature, safety and security are especially important for users, including seniors, persons with disabilities, youth and other groups considered vulnerable. As a result of COVID-19, safety and security will continue to be important but will take on new meaning. The perceived effectiveness of any safety measures imposed during the pandemic will affect commuter's willingness to use transit (Global News, 2020). There are likely to be higher expectations --- and closer scrutiny --- of service operators, in terms of cleanliness and adherence to social distancing measures, as well as the degree to which other riders follow suit. Potential riders who also own an automobile are likely to weigh cost savings or convenience factors against risk of being in contact with someone who may have (including unknowingly) contracted COVID-19.

#### • Aesthetics

Not surprisingly, clean, comfortable and maintained transportation were cited as important factors contributing to transit ridership prior to the pandemic, and will remain paramount to commuters' willingness to use group/shared transportation services during or after COVID-19. Aesthetics may become a proxy for operators' care and attention to rider safety.

#### **Additional Factors:**

A number of additional points can be made in regard to COVID-19 and its impact on commuters and their utilization of public transportation.

• The COVID-Accelerated Shift Towards Telecommuting/ Teleworking Will Impact Commuter Demand

The shift towards alternative work options during the pandemic --- primarily a movement towards working from home --- has led to a change in commuter patterns. The rise in the



number of workers able to work from home as well as employers' willingness to have them do so, will have an impact on the demand (or lack thereof) for commuter transportation services and overall ridership rates.

The increase in teleworking also means that fewer workers are using either private vehicles or public transit. According to a study conducted by Statistics Canada on the impact of COVID-19 on transit ridership, more than four in 10 public transit users (42%) have switched to telework (Savage and Turcotte, 2020). Whether this remains the pattern in years to come is uncertain --- the ability to work off-site (most often from home) is very much sector and employer-dependent.

# • There are Core Commuter Groups to Consider During COVID-19... and Beyond

While the types of commuters have not changed, individuals who continue to utilize public transit during COVID-19 mainly consist of several core groups: women, people of colour, and those who are poorly paid, as well as essential workers, including frontline service workers and food service workers (Medium, 2020).

#### • Increasing Car Ownership

While lack of car ownership was mentioned as one of the factors influencing the use of public transit prior to the pandemic, the fear of public transit following the outbreak has increased the attention and desire for people to own and use private automobiles (Jackson, 2020).

# • Potential for Increased Traffic Congestion in Medium-Term

Lastly, with changing commuter patterns as a result of the pandemic, patterns in traffic congestion are also changing. Recent literature notes that car ridership often spikes during pandemics, changing the demand for public transportation and impacting transit capacity. Although commuter traffic declined sharply when restrictions on mobility and social interaction were in effect, a follow-on shift away from using commuter transportation services could increase traffic congestion. This increased congestion could also contribute to longer commuting times for those continuing to use commuter (or public) transportation services.



# 2. Executive Summary

# Purpose of the Project

The Eastern Ontario Leadership Council, with significant support from the Province of Ontario, undertook a project called the Commuter Transportation Analysis and Business Case Development Project (or the Commuter Strategy for short), to validate (or disprove):

- That <u>lack of access to cross-boundary transportation</u> is a barrier to employment in Eastern Ontario, either directly (getting back and forth to work) or indirectly (getting back and forth to training and education, or accessing other employment-related services). [Note: the EOLC is focused on cross-boundary considerations, knowing that transportation within a municipality is the responsibility of that local government. The EOLC is also aware of data showing that at least a quarter of commuters in 2016 were going back and forth to work in a different community than the one in which they lived. This statistic is up considerably from a decade earlier.]
- The expectation that the flow patterns of commuter (and employer) <u>demand for</u> <u>transportation services are sub-regional in nature</u> and that the <u>data will suggest service</u> <u>models</u> that can form the basis of design in specific areas of the region (e.g. a conventional 'commutershed' model, a corridor model, a hub and spoke model)
- That the EOLC, in conjunction with regional stakeholders, can develop <u>business cases for</u> <u>commuter transportation options that are financially sustainable</u>.

# Project Steering Committee

The first stage in the Commuter Strategy Project was to create a Steering Committee to provide oversight of the project and offer suggestions/provide strategic feedback as the Commuter Strategy progresses. That Steering Committee was formed in late 2019, under the leadership of City of Cornwall CAO Maureen Adams, with representation from across the region:

- Ben de Haan, Director of Transportation and Planning Services, United Counties of Stormont, Dundas and Glengarry
- Denise Marshall, Manager, Project Engineering, Northumberland County and a Member of the EOLC's Integrated, Intelligent Transportation Systems Working Group
- Jason Dennison, Workforce and Labour Market Advisor, Fleming College, also a member of both the EOLC's Integrated, Intelligent Transportation Systems Working Group and its Workforce Development and Deployment Working Group
- Katherine Graham, Professor Emeritus, Carleton University and Project Coordinator, Eastern Ontario Post-Secondary Task Force, and also a member of the EOLC's Integrated, Intelligent Transportation Systems Working Group and its Workforce Development and Deployment Working Group



- Lisa Severson, Communications and Stakeholder Relations Officer, EORN Inc., and a Member of the EOLC's Integrated, Intelligent Transportation Systems Working Group
- Paul Moreau, CAO Renfrew County and a Member of the EOLC's Integrated, Intelligent Transportation Systems Working Group
- Peter Fredricks, Past Chair, Haliburton CFDC and a member of the EOLC
- (ex officio) Kathryn Wood, Project Coordinator for the EOLC and the Commuter Strategy Project and Jeff Hudebine, Eastern Region Director, Ontario Ministry of Transportation.

#### Literature Review and Case Studies

The second stage in the Project was undertaking a Literature Review and consolidation of relevant case studies. This report represents the first draft of a report summarizing the available public domain literature relevant to this specific project. In all, more than 60+ books, articles and other publications have been identified, and summarized in the end notes section of this report. The Literature Review included searches through web-based sources, university-based services, consultations with academics who have related subject matter expertise and research interests, and with municipal staff with experience designing/implementing transportation services to meet specific local or cross-boundary needs.

It is anticipated that as the Commuter Strategy Project progresses, additional resources and expertise may be identified. These will be added to the report and made available for public use, along with other project deliverables. Documents cited in this Literature Review are available for stakeholder review in Dropbox and can be accessed by requesting permission from EOLC Project Coordinator, Kathryn Wood at <u>kwood@pivotalmomentum.com</u>.

#### Summary - What We Have Learned So Far

In addition to the observation that the literature and associated data sets related to virtually any form of 'local' or 'regional' transportation service in Ontario or Canada is highly-distributed and has not been analyzed for best practices purposes, several highly useful reports were identified from the United States. These are believed to have relevance for the Canadian/Ontario context and have therefore been utilized extensively in this Literature Review.

Some 'lessons learned' have been reported in the What We Have Learned So Far section and others have been incorporated into the appendices. In particular, Appendix C consolidates information that will be of relevance to subsequent stages of the project, particularly service design and pilot project phases. In particular, four reports are highlighted for these purposes:



- Burkhardt, J.E., Nelson, C.A., Murray, G., and D. Koffman. (2004). TCRP Report 101. Toolkit for Rural Community Coordinated Transportation Services. Retrieved from http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp rpt 101.pdf
- Chisholm Smith, G. (2012). Rural Public Transportation Strategies for Responding to the Livable and Sustainable Communities Initiative. Research Results Digest, 375. Washington, DC: Transportation Research Board. Retrieved from https://www.nap.edu/read/22761/chapter/1
- Miller, E., Shalaby, A., Diab, E., and D. Kasraian. (2018, October). *Canadian Transit Ridership Trends Study*. Final Report. University of Toronto Faculty of Applied Science and Engineering. Retrieved from

https://cutaactu.ca/sites/default/files/cuta\_ridership\_report\_final\_october\_2018\_en.pdf

 National Academies of Science. (2017). Best Practices in Rural Regional Mobility. National Academies of Science, Engineering and Medicine, Transportation Research Board, National Cooperative Highway Research Program, National Academies Press. Retrieved from <u>https://www.nap.edu/catalog/24944/best-practices-in-rural-regional-mobility</u>

# Nine Key Observations:

This Literature Review has generated nine observations that are instructive for the Commuter Strategy Project and the stakeholders who seek to address the challenges of cross-boundary commuter transportation in Eastern Ontario:

- 1. There are few existing cross-boundary or urban-rural service models on which to base service designs in Eastern Ontario. This may be largely historical (individual municipalities have the responsibility for 'public transit' within their boundaries) but there are other factors that may contribute to the relative absence of these services.
- 2. There Are Few Commuter-Focused Transportation Models Outside Major Urban Centres. This phenomenon is likely due to 'market failure', where the financial feasibility of rural transportation services is undermined by geographic dispersion of population, workforce and places of employment. Higher densities in urban areas reduces the 'cost per mile' or 'cost per passenger'.
- 3. Cross-mandate (multiple rider segments) or cross-boundary collaborations are difficult to create or maintain. This may be due to the challenges of building/maintaining any multi-stakeholder initiative but may also be due to the legacy systems and services that specific services/operators may be loath to consider changing or bringing into a coordinated approach.



- 4. The financial sustainability of cross-boundary, urban-rural or cross-mandate transportation services is a significant challenge. This may be due to the combination of relatively lower financial resources assumed for target rider/user groups, the assumption that these services would be funded by local governments, the higher costs of serving geospatially dispersed riders/users, and the relatively rare focus on commuters and employers who might have a financial interest in helping to create financially sustainable services.
- 5. The factors influencing both short and long-term success of these transportation services are now better understood. The complexity of providing group transportation options, along with the interplay of the many factors affecting operational performance means that predicting future success or even making adjustments along the way requires regular review, iteration and adjustments to existing programs/services. This continual need for adjustment must be built into collaborative relationships from the beginning.
- 6. The goals of these transportation services shape their design, utilization and ultimately the benefits derived from their creation. Long-term success depends on designing and operating services that meet the needs of identified priority riders/users. Designs and operations are quite different for commuter services than for those that meet the needs of low-income groups, the elderly, those with disabilities or other transportation-disadvantaged groups. Typically, the services that work well for the former group (commuters) do not work well for transportation-disadvantaged groups and vice versa.
- 7. The return on investment from these transportation service investments matters, and should be tracked and reported on if new services are to reach launch stage and remain viable. Those who use and fund these services (the riders/users are often different than those who fund the services) have different expectations and foresee different benefits. Riders/users are typically looking for a more cost-effective way to move back and forth whereas funders/financiers may be looking for ways to use transportation services, reduce unemployment, or stimulate greater personal independence for residents. Success requires identification of these goals at the outset, along with mechanisms to determine how/if they will be met.
- 8. There are methodologies available to Eastern Ontario for executing a project such as the Commuter Strategy Project, and for the design and implementation of coordinated (multi-stakeholder, cross-boundary) transportation services that might ensue. Appendix C is a consolidation of information that will be useful to project proponents as well as service design professionals and financial sustainability modellers in narrowing the focus to projects that hold the greatest prospects for success.



9. Relatively new, external influences, such as telecommuting and deployment of digital technologies, are now impacting commuter transportation options, and open up possibilities for new/different types of services in Eastern Ontario. These factors will influence total demand (e.g. telecommuting may reduce demand, online booking systems may increase it), offer new service options (e.g. autonomous vehicles may lead to intermodal connection services), or change the way riders/users access transportation services (e.g. ordering online/on-demand services, use ride-sharing services or car-pooling/commuter lots).

#### What Is Next?

During the completion of the Literature Review phase of the Commuter Strategy project, several other project activities commenced and were expected to unfold in the spring and summer of 2020:

- **Consolidation of existing potential commuter demand information** based on existing public domain and potentially propriety databases (the latter depending on need/perceived value), and geospatial analysis. This work is the foundation for identifying potential cross-boundary transportation services routes.
- Consultations with key stakeholders across the region who can provide insight into the patterns of potential demand, suggest business models and revenue sources for new or modified transportation services to make employment more accessible to those who are currently commuting back and forth to work across municipal boundaries or who would if cost-effective services were available. These stakeholder groups include economic development officers and transportation managers in municipal governments, employers, employment service organizations/agencies and commuters themselves.

"A recent briefing paper from the Fund for Our Economic Future, an alliance of Northeast Ohio funders dedicated to advancing growth and opportunity, points to the need for local and regional civic, business and non-profit leaders and policymakers to focus on issues of spatial access to jobs."

Source: Barkley, B. and A. Gomes-Pereira. (2015). A Long Ride to Work: Job Access and Public Transportation in Northeast Ohio. The Federal Reserve Bank of Cleveland.

Analysis of the data and information gathered through earlier phases, especially in ways
that support geo-spatial and financial analysis. This analytical work is essential to the design
of potential sub-regional transportation services, estimation of potential demand for these
services, and the financial (cost-revenue) modelling of the likely success of these services.
This information will be key to building collaborative, cross-boundary partnerships that create
and test pilot projects targeting for launch in late summer/early fall of 2020.



# 3. Overview: What We Learned So Far

#### 1. There are Few Existing Cross-Boundary or Urban-Rural Service Models

- There are relatively **few cross-boundary** (or as described in the U.S.), multi-county transportation initiatives. Most community transportation initiatives emerge to address needs in a single community and most often in urban areas of significant size. Further there are **few rural-urban transportation initiatives** that cross municipal boundaries ---- but there are some!
- There are some indications that the transportation needs of rural residents are attention garnering from significant policymaking and funding bodies. Increasingly these organizations are posting Requests for Proposals that target their specific areas of interest rather than creating wide

"Many rural communities have evidenced real leadership in combining the travel resources of human service organizations and also opening such services to members of the general public. Despite these successes, transportation services in some of these same rural communities have been <u>unable to</u> <u>cross township, county or state boundaries</u> to coordinate transportation services with neighbouring communities."

Source: Burkhardt, J.E., Nelson, C.A., Murray, G., and D. Koffman. (2004). TCRP Report 101. Toolkit for Rural Community Coordinated Transportation Services. p. 14. Retrieved from <u>http://onlinepubs.trb.org/Onlinepubs/tcrp/tcrp\_rpt\_101.pdf</u>

open competitions. For instance, the AASHTO Council on Public Transportation in the U.S. expects to fund a project this year to address the role that transportation can play in assisting employers in finding workers and other economic factors. The U.S. Federal Transit Administration created a <u>specific funding program</u> for rural areas and towns/cities under 50,000 population to "use or develop transit technologies and innovations that make services more cost-effective and efficient." Of the roughly 850 grants provided through this program, one in five (22%) were "multi-county" initiatives. Fewer than 10 crossed a state boundary.

#### 2. There Are Few Commuter-Focused Transportation Models Outside Major Urban Centres

• Most community transportation initiatives are focused not on commuters but on specific groups that are understood to be at least transportation-disadvantaged, if not disadvantaged overall (e.g. low income, seniors, youth). This is not to suggest that commuters are not considered a 'secondary' market; often they are considered as part of the general public to whom a service is opened up after the design process for the primary group(s) has been determined.



• Lack of data is a significant barrier to being able to develop community-based transportation initiatives, let alone validate if they are likely to be financially-sustainable over the long term. Some subject matter experts identify the lack of data as being especially acute in rural areas --- the same areas in which sparse populations and long distances (for either a commuter in an automobile or operators of some type of group transportation service) make commuting relatively expensive а proposition.

As a result, most initiatives appear to have been based on anecdotal information or limited/incomplete data, rather than rigorous demand analysis. This may be because a) outside of large urban centres, data on transportation utilization and needs

"Coordinated transportation services offer many benefits to many rural communities, but the coordination process takes real work. Many of the challenges faced will involve ways to forge cooperation among individuals who are not used to working with each other. Successfully addressing these challenges can create transportation services that serve more persons at lower unit costs."

Source: Burkhardt, J.E., Nelson, C.A., Murray, G., and D. Koffman. (2004). TCRP Report 101. Toolkit for Rural Community Coordinated Transportation Services. p. 7. Retrieved from http://onlinepubs.trb.org/Onlinepubs/tcrp/tcrp rpt 101.pdf

is sparse, and b) organizations advocating for disadvantaged groups typically do not have the resources to fund significant data collection or acquisition exercises.

#### 3. Cross-Mandate or Cross-Boundary Collaborations Are Difficult to Create or Maintain

- **Transportation is rarely the "only" factor** that must be addressed in meeting the needs of disadvantaged groups. Community responses often link income, education, safety, housing and health care with transportation. Some literature suggests that this can not only make service design challenging but may lead to agencies feeling threatened or in a competitive situation with other organizations serving similar target groups.
- Transportation-related collaborations among organizations with mandates to assist specific populations are difficult to build or sustain but they are important to efficient, effective use of community resources. This may be related to the challenges in establishing or maintaining financially-sustainable services.
- The <u>TCRP Toolkit</u> suggests that coordinated transportation services typically should involve multiple stakeholders:
  - Public transportation providers
  - Government departments of health and social services



- Departments of health and mental health
- Area agencies on aging
- Vocational and/or developmental disabilities participants
- o Departments of employment
- Departments of education
- Private non-profit organizations (ex. Red Cross, Faith-Based Organizations)

Although mentioned in other places in the Toolkit, employers, insurance companies, business or trade associations, and other stakeholders with interests in commuter transportation are not included in the preceding list. "Coordination will not solve all transportation problems in all communities. It needs to be seen as one of several possible management or problem-solving tools in order to determine if coordination can improve the transportation services in a particular locality. Transportation planners must first gather data about the potential population to receive transportation services and the current transportation providers. The next step is to analyse the effectiveness and efficiency of current services in meeting the service population needs."

Source: Burkhardt, J.E., Nelson, C.A., Murray, G., and D. Koffman. (2004). TCRP Report 101. Toolkit for Rural Community Coordinated Transportation Services. p. 88-90. Retrieved from <u>http://onlinepubs.trb.org/Onlinepubs/tcrp/tcrp\_rpt\_101.</u> <u>pdf</u>

- 4. Financial Sustainability of Services Is a Significant Challenge
  - Riders/system users' **ability to pay is usually discussed in relative terms** (e.g. trip costs in relation to a taxi or being able to afford a private automobile) and may be referred to as 'financial accessibility'.
  - There are multiple instances in which a **service was piloted before a significant commitment** was made to the initiative (as in a 'permanent' program). It is not clear however if pilot data was collected and deployed in the more permanent program ---- beyond perhaps basic ridership and financial data.
  - Sources of revenue tended to be focused on municipal governments, provincial/statelevel grants, subsidies or in some jurisdictions, gas taxes, support from non-profit organizations, and donations. These sources of revenue likely became targets as a result of choices on the focus of the transportation initiative (e.g. disadvantaged groups). There are some indications that transportation service operators and advocates may miss out on some funding opportunities; there are relatively few indications of considering revenue sources such as employers; this is likely also due to the focus of transportation initiatives (groups other than commuters).



• A number of services published their annual **costs of service delivery** but these are not generally reported in a form that could be used as heuristics (rules of thumb) when designing services in other communities.

#### 5. Factors Influencing Both Short and Long-Term Success are Now Better Understood

- Relatively few transportation initiatives indicate the 'ramp up' time required from service launch to success or steady state (capitalizing on maximum utilization). Those that did provide this information offered varying estimates --- from seven months to two years. Subject matter experts suggest that six months to a year would be a reasonable timeframe in which to expect to see the profile of a service's success.
- In rural areas, most residents perceive themselves as having no alternative to **owning a car**, whether they are working or not. Beyond commuting, there are many other aspects of daily living that require a citizen to be mobile (health care, grocery shopping, recreation and entertainment, and volunteering). Without transportation service that is ubiquitous, many citizens will continue to own a car --just to 'get around'. This makes it harder to convince them to use а group transportation service --- and more difficult for operators to achieve or maintain at least breakeven operations.

"Given various factors, including additional wait and/or transfer times and frequent stops for other passengers, travel time to work is typically much longer for transit commuters compared to those who drive to work. Approximately 32 percent of transit commutes in Northeast Ohio take at least 60 minutes, which is slightly lower than the national rate (32 per cent). Most auto commutes in the region take less than 30 minutes."

Source: Burkhardt, J.E., Nelson, C.A., Murray, G., and D. Koffman. (2004). TCRP Report 101. Toolkit for Rural Community Coordinated Transportation Services. p. 47. Retrieved from http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp\_rpt\_101

 Some behavioural factors appear to have more influence on commuters' decisions about modes of travel and using a group service than for other target groups. For instance, commuters may value *control over their travel (including convenience), reliability* of a service, and *time efficiency* more than someone using a transportation service to get to a medical appointment.



There is some indication that contemporary commuters put value on being able to 'do something else' while commuting, thus leading to greater personal productivity. Safety while commuting, including weather and road conditions, may also be a significant issue, and may favour group travel options (with drivers) over single occupant vehicles.

The availability of *technology-based supports* (ex. trip booking, on-time performance) are increasingly important to the commuting public. And finally, there is some reason to believe that younger citizens would prefer *not to have to own a car at all*, making them good candidates for group transportation options. These observations suggest that the design of a commuter-oriented service would need to be sensitive to a *multiplicity of factors, not just trip cost.* 

 Stakeholder groups seeking to plan for and implement a cross-boundary transportation service, the <u>Transit Cooperative Research Project Toolkit</u> offered the following summary of factors that lead to successful coordinated (or multi-stakeholder) transportation services. Note that the case studies reviewed to produce the toolkit tended to focus on agency-based services to address the transportation challenges of disadvantaged groups (e.g. elderly, youth, low-income residents), although there is certainly overlap between the two target user groups.

Fundamental Components of Successful Coordinated Transportation Projects	Reasons Why Coordinated Transportation Services Have Not Prospered or Have Ceased to Exist:			
<ul> <li>Partnership approach: shared power, shared funding; shared responsibility</li> <li>Community-wide focus and community-wide support</li> <li>Resource management and quality control</li> <li>Maximizing productivity: ride sharing</li> <li>Business focus: full cost recovery</li> <li>Coordinated service scheduling with non-transportation providers</li> </ul>	<ul> <li>Not fully understanding local politics</li> <li>Not treating coordinated transportation like a business</li> <li>Not developing a strong institutional foundation</li> <li>Allowing partners to develop unrealistic expectations.</li> </ul>			

Factors Leading to Successful Transportation Services... Or Not:

Table 1 – Source: Burkhardt, J.E., Nelson, C.A., Murray, G., and D. Koffman. (2004). TCRP Report 101. Toolkit for Rural Community Coordinated Transportation Services. p. 88-90. Retrieved from http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp\_rpt\_101.pdf.<u>Retrieved from</u> <u>http://onlinepubs.trb.org/Onlinepubs/tcrp/tcrp\_rpt\_101.pdf</u>



**Important Aspects of Service in Successful Projects**: Elsewhere in the Toolkit (p. 91), the following service aspects are mentioned as very important to success for coordinated services, as well as single agency services:

- Customer orientation (responsiveness to riders' needs not just vehicle operation)
- Broad service spectrum (group transportation for specialized or emergency services)
- Intelligent use of volunteers (to handle trips not otherwise cost-effective)
- Documenting the benefits of mobility (and transportation services that deliver mobility)
- Targeted marketing (to specific riders and stakeholder groups), and
- Travel training (for intended riders).

**Key Characteristics of Successful Coordinated Transportation Initiatives:** The Toolkit also mentions (p. 100) the following "lessons learned" from successful coordination efforts (key characteristics):

- Real leadership and energy from political, human service, or transportation stakeholders
- Sound planning process (goals and objectives, strategic plan, operations plan, detailed implementation structure; commitment to re-plan and reconfigure)
- Sound technical support (including data, resources, use of IT and other tools)
- Effective participation of all applicable agencies
- Demonstrated coordination benefits
- Modifications to services and financial participation patterns.

[Source, TCRP Toolkit, p. 17]

**Seven Best Practice Lessons Learned**: A best practices study by Chisholm Smith (Best Practices in Rural Regional Mobility) summarized seven 'lessons learned' as:

- State (or provincial) policies can make a difference
- Different organizational approaches can work
- Local champions are required
- Needs of multiple markets should be addressed
- An appropriate service design will attract more riders
- Connectivity and providing service information are important
- Creative funding may be needed.



# 6. Transportation Service Goals Shape Design, Utilization and Ultimately Benefits

The TCRP Toolkit notes that there can be different goals held by different stakeholders across a cross-mandate (or cross-boundary) transportation service, and that these need to be clarified at the outset of planning (source: TCRP Toolkit, p. 18).

# Examples of Goals for Coordinated Transportation Projects:

- Doing more with limited existing resources
- Utilizing transportation investments more efficiently
- Enhancing mobility within <u>and between</u> communities
- Increasing access to jobs and jobs training
- Preserving individual independence, and
- Enhancing the quality of life.

[Underline added to highlight potential goals of crossboundary transportation services to be considered as part of the Eastern Ontario 'Commuter Strategy' Project.]

The Toolkit authors also note that there may be additional local coordination objectives (held by operators or funders) are:

- Generating new revenues
- Reducing the costs of providing trips
- Increasing efficiency and productivity of transportation services
- Increasing mobility <u>within</u> the community.

On an operational level, the Best Practices in Rural Regional Mobility report notes that disconnected/ uncoordinated transportation services can lead to many local/regional transportation challenges:

- Multiplicity of operators/significant duplication and gaps
- No formal mechanism for cooperation or communication

Multiple analyses have suggested that <u>30</u> <u>minutes</u> is the 'tipping point' at which a commuter's travel experience begins to degrade --- regardless of mode.

In the 1970s, Israeli transportation engineer Yacov Zahavi, "discovered the surprising result that the total amount of time an average individual spends on travel each day is approximately the same regardless of the city size or the mode of transportation. Roughly speaking, the average commute time from home to work is about a half hour each way independent of the city or means of transportation."

From: Scale, The Universal Laws of Growth, Innovation, Sustainability and the Pace of Life in Organisms, Cities, Economies and Companies, by Geoffrey West, 2017, p. 333

"Cesare Marchetti, an Italian physicist, declared that people have always been willing to commute for about a half-hour, one way, from their homes each day.... The value of land is governed by its accessibility --- which is to say, by the reasonable speed of transport to reach it.... The average one-way commute time in American metropolitan areas today is about 26 minutes."

Source: CityLab. (2019, August 30). The Commuting Principle That Shaped Urban History. p. 1-17. <u>https://www.citylab.com/transportation/2019/08/c</u> <u>ommute-time-city-size-transportation-urban-planning-history/597055/</u>



- Total level of service well below level of need; unmet needs
- Excess travel by transportation providers with underutilized vehicles
- Significant variation in services available during certain times of day or days of week/specific groups of persons
- Substantial variations in service quality
- Lack of reliable information
- Absence of overall compendium of services
- Absence of reliable mechanism to quantify overall service needs and create a comprehensive plan to address these problems.

# 7. Return on Investment from Transportation Service Investments Matters

The Toolkit notes (on p. 31) a 1998 study by the American Public Transportation Association that found that the ratio of benefits to public costs is understood to range between 4:1 and 5:1. A study specifically for rural communities demonstrated that personal transportation services delivered benefits such as:

- Reduced unemployment and better jobs for workers, due to increased access to jobs
- Riders become (and stay) more independent with better access to healthcare, welfare and shopping
- Riders can shop where costs are lower
- Riders save on travel costs
- Local businesses increase their level of activity, more money is spent locally, and new businesses and visitors are attracted to the community

"Stakeholders should never forget that it is the customers of the coordinated transportation services that matter most."

Source: Burkhardt, J.E., Nelson, C.A., Murray, G., and D. Koffman. (2004). TCRP Report 101. Toolkit for Rural Community Coordinated Transportation Services. p. 47. Retrieved from http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp\_rpt\_ 101.pdf

• Communities benefit by the best use of their unique environments.

Economic impact studies show that the returns on investment in transportation in rural areas is somewhat lower but still positive: 3:1.

It will be important for Eastern Ontario stakeholders to determine how many of these benefits are important to the 'Commuter Strategy project', and if there are multiple benefits to be secured, which ones are the priority? The original formulation of the project put the emphasis squarely on the first benefit on the preceding list (reduced unemployment and better jobs for workers, due to increased access to jobs).



#### 8. There Are Methodologies for Implementing a Coordinated Transportation Project

The Toolkit recommends a seven-step process for implementation of a coordination project (defined in the report as multiple parties working together to collaborate on better transportation solutions for particular target groups <u>and/or jurisdictions</u>) [emphasis added].

The implementation plan for the Eastern Ontario 'Commuter Strategy' is quite similar to this recommended approach, except that in Eastern Ontario, different coordination options may be appropriate across the region, and multiple 'preferred choices' (or models) may be tested, to maximize learning.

Chapter 6 of Best Practices in Rural Regional Mobility (by Chisholm Smith et al), presents a very similar checklist for those striving to develop a rural regional service, but suggests 12 steps (see following page).

The major differences are a greater emphasis on goals and vision (including public and stakeholder input), identification of resources, and assessment of feasibility in the Best Practices report. The Eastern Ontario approach places a similar emphasis on public and stakeholder input and assessment of feasibility. The recommended implementation steps are

- Step #1—Initiate the Improvement Process—Form a task force or steering committee and decide to move forward.
- Step #2—Analyze Existing Conditions—Understand issues, needs, and circumstances; define local conditions.
- Step #3—Establish Focus, Consensus, and Direction—Agree on the problem, develop a consensus, and set a direction.
- Step #4—Design Alternative Courses of Action—Develop alternative coordination strategies.
- Step #5—Assess Alternative Options—Evaluate the alternatives and select the coordination option to implement.
- Step #6—Implement the Preferred Choice—Formulate action plans and implement coordinated transportation services.
- Step #7—Evaluate and Improve the System(s) Implemented—Review and evaluate progress.

Table 2 - Burkhardt, J.E., Nelson, C.A., Murray, G., and D. Koffman. (2004). TCRP Report 101. Toolkit for Rural Community Coordinated Transportation Services. p. 47 Retrieved from http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp\_rpt\_101.pdf

Steps in Creating and Implementing a

Coordinated Transportation Service (as outlined by the Best Practices in Rural Regional Mobility report):

Step 1: Identify needs	Step 7: Prioritize – recommended plan
Step 2: Identify planning leadership	Step 8: Detailed Service Plan
Step 3: Goals and Vision – Public and stakeholder	Step 9: Detailed Organizational Plan
input	Step 10: Implementation Plan and Action Items
Step 4: Identify resources	Step 11: Initiate Service
Step 5: Develop alternatives	Step 12: Evaluate and Fine Tune – Iterative
Step 6: Assess feasibility	Process



#### 9. Relatively New, External Influences Are Impacting Commuter Transportation Options:

- Increased **prevalence of telecommuting** would reduce both a transportation service's operating costs and a commuter's annual travel cost, but would also make transportation service capacity utilization forecasts more challenging. Of course, not all employees can telecommute; many must be on site to do their jobs properly. Flexibility in work location is becoming an important factor in employees' choices about whose offer of employment to accept, as evidenced by increasing numbers of recruiters recommending the inclusion of work location policies in job postings/ advertisements.
- A range of digital technologies that improve travellers' ability to learn about, book and pay for transportation services is increasingly shaping commuters and travellers of all

types. Ridesharing services, Uber/Lyft, proprietary on-demand booking services, parking spot locate-and-pay services, wifi onboard, traffic congestion and/or travel condition information services --- virtually all of which are delivered to a mobile device --- all shape the decisions that commuters make each day.

At least in the minds of subject matter experts, it is not clear how or when autonomous vehicles: vehicles (or connected autonomous vehicles: C/AVs) will make a contribution to addressing commuters' needs, especially in rural areas. There is some expectation that C/AVs may be deployable over the next decade in very specific, fixed and scheduled route situations

"... Consumer preferences are also changing. Millennials and baby boomers alike want more accessible communities, whether that means a workplace within reach of transit or downsizing from large suburban homes to areas where amenities are just a walk away...Job access is certainly not the only component for regional economic success, but it is an important one..."

Source: Barkley, B. and A. Gomes-Pereira. (2015). A Long Ride to Work: Job Access and Public Transportation in Northeast Ohio. The Federal Reserve Bank of Cleveland.

but that the longer distances for rural commutes mean that single occupancy trips are still costly --- with or without a driver.



# 4. Highlights from Literature on Addressing Questions for Eastern Ontario

# 1. On What Audience(s)/Target Group(s) Does Literature/Case Studies Focus?

Most Ontario transportation studies and initiatives --- including operating services --- outside of major urban areas (e.g. conventional public transit) focus on seniors/elderly persons, persons with disabilities or special needs. Some --- including rural-urban initiatives --- include commuters in their target audiences as part of 'the general public' but there are few *Ontario* analyses or initiatives that focus specifically or solely on commuters: Collingwood, and a Merrickville-Wolford to Ottawa bus service (now discontinued) do have a commuter focus. In the United States, the City of Howell-Flint Michigan dedicated commuter service for manufacturers, and the RideJaunt program in Charlotte, North Carolina stand out as comparators to the services contemplated in the Eastern Ontario 'Commuter Strategy'. A state-wide transportation analysis undertaken in Colorado commented on commuter services --- particularly to resorts --- as part of their comprehensive review of both urban and regional services. It is important to note that in larger urban centres, commuters would be considered as part of the general public able to use a comprehensive public transit system. These analyses may or may not be in the public domain as part of a municipal transportation master plan.

# Studies on People Needing/Accessing Transport:

**Transportation Master Plan in the State of Colorado** -- includes many routes connecting suburban communities to the Denver CBD, services operated to resort communities, and services providing access to medical and other services. Intercity services tend to focus on four potentially transit-dependent population segments: young adults, elderly/65+, persons living below the poverty line, and auto-less households. Notably, Colorado increased the age range for the youth category from <u>18-24 to 18-34</u> because research data showed that this age group comprised three-quarters of their *inter-city* ridership. The study compared geographic locations currently served to locations that would have concentrations of people more likely to need public transportation. The analysis created population blocks based on a) the density of potentially transit-dependent persons, and b) the <u>percentage of potentially</u> transit-dependent persons in the population block.

**Commuters:** The Rural Ottawa Commuters study (Carroll, 2019) addresses commuter needs specifically. As a subset of commuters, Hambly and Lee (2019) studied the potential for financial savings for commuters in southwestern Ontario if they were able to use telecommuting to reduce travel back and forth to work.



**Youth:** The Lanark County Youth and Young Adult Transportation study looked at youth and young adult's transportation challenges, current transportation options, and unmet transportation needs (Lu, 2016<sup>i</sup>). A report in Rural Ottawa (Fraser, 2012) addressed the same target audience.

**Disadvantaged Groups:** The Huron County Case Study: Assessing Transportation Disadvantage in Rural Ontario, Canada: A Case Study of Huron County (Marr, 2015) focused on the disadvantaged groups: Five demographic groups were found to be at risk of transportation disadvantage: older adults (65+), those with physical and mental disabilities, youth, people in low-income households, and women (Marr, 2015, p.100).

**General Public:** The preceding Lanark County study considered all potential riders/users across the county.<sup>ii</sup> The report mentions youth (references Lu, 2016 cited above), seniors, commuters, low income, tourists/ seasonal residents and adults (not included elsewhere) (Rogers and Leitch, 2016). Other studies taking a general public focus include: General Study of Canada' Ridership (Canadian Urban Transit Association (2019), the Canadian Transit Ridership Trends Study Final Report, Miller, E., Shalaby, A., Diab, E., and D. Kasraian (2018), Transit Ridership Canada report (Curry, 2017), General Social Survey Canada (Turcotte, 2010).

# **Case Studies or Actual Rural Transportation Service Initiatives:**

# Commuter-Focused:

**417 Bus Lines:** provides a daily commuter coach service travelling between North Glengarry Township and Ottawa-Gatineau, with stops in Alexandria (unstaffed Via Station) and Maxville. This service uses the OC Transpo transitway to move in/out of Ottawa efficiently.

**Colltrans - Collingwood-Wasaga Beach and Collingwood Blue Mountains Transit Links:** On the Collingwood-Wasaga Beach route, the target groups (users/riders) are residents who need *transportation to and from school and work*. The Collingwood-Blue Mountain service focuses on *employees* getting to work at the Blue Mountain Resort and other businesses in the village. (Rural Ontario Institute, 2014 b, p. 10).

**Colorado Transportation Plan** --- Colorado currently operates a range of inter-city and regional transportation services (the latter serving a distributed network of employers including well-known resort communities). Because of the economic importance of Colorado's resorts, the state-wide study explored these services in more detail than other workplaces.



**Flint Michigan-Howell Bus Service for Manufacturing Workers:** In 2016, the Flint-Michigan Transportation Authority (MTA) began operating a dedicated bus service connecting workers in Flint Michigan to a cluster of manufacturers in the City of Howell. This service was developed in response to filling a growing employment gap in Howell, concerns about commute lengths and costs, and collaboration with the Howell Area Chamber of Commerce and Ann Arbor SPARK. (see: <u>https://www.mtaflint.org/regional-routes.html</u>)

# General Public/Other

**Community Care Northumberland:** transportation services are provided for families, youth, seniors, and adults wanting to attend appointments, meetings, work, school, social activities, shopping and recreation (Rural Ontario Institute, 2014 b, p. 17).

**The Corridor 11 Bus:** coordinated transportation option for Muskoka residents (general public), along the HWY 11 corridor (Rural Ontario Institute, 2014 b).

**Deseronto Transit:** Ensures access to work, education, health care, shopping, social and recreational opportunities. Commuters, students, seniors, low-income, seniors and persons with disabilities (general public). Set route (Rural Ontario Institute, 2014 b).

**Ride Norfolk Transit:** The original service was meant to improve access to employment (commuters), the route system and services hours, however, were not conducive to this. The major users of the service are seniors, single mothers, and youth who do not own a vehicle and are travelling to medical appointments, shopping, or leisure and social activities (Rural Ontario Institute, 2014 b).

Haliburton Rideshare: Open to general public. No mention of restrictions. Ridesharing involves two or more travelers sharing a ride in a private vehicle, where both the driver and the passengers have a similar starting point, end point and/or route. For regular travel to the same place, this is also known as carpooling (Rogers and Leitch, 2016, p. 22). Note: this service is no longer running (<u>https://www.transportationhaliburtoncounty.ca/haliburton-rideshare-wrap-up/</u>).

**Kawartha Lakes Rural Transit Pilot Project (City of):** Open to general public. No mention of exact target groups. Inclusive of work commuters. (Rogers and Leitch, 2016)

**Temiskaming Shores:** General public. Seniors and youth are mentioned but the service is understood to be for the general public (Rogers and Leitch, 2016). There is no evidence indicating that this service is still operating.

**RideJAUNT:** A regional, rural service in Charlottesville, Virginia; serves six counties as well as the urban area of Charlottesville; makes 300,000 trips annually through a 2,600 square



kilometre service area; serves the general public- carrying riders to work, medical appointments, stores, leisure activities, and other destinations; offers 'connector' service (inter-region), 'circulator' services (door to door within a specific area), and expressed fixed route services (to reliably serve peak demand times and location); has a fleet of 85 vehicles; scheduling a ride can be done by phone or email, with payment by cash or cheque; can buy single fares or books of tickets; has been running since 1975; funding comes from local, state and federal funding to supplement fares and agency payments (see <u>www.ridejaunt.org</u>).



Service	Specifically Serves							
	Commuters	Students/ Schools	Seniors and/or Elderly	Youth	Healthcare/Social Service Appts.	Persons with Disabilities	Low Income Residents	General Public
CollTrans (Collingwood)	•	•	•	•	•	•		
Community Care Northumberland		•	•	•	•	• (specialized options)	•	•
Corridor 11 Bus (Muskoka)								• (does not specify groups)
Deseronto Transit	•	•	•			• (partially accessible)	•	•
Haliburton Rideshare				No	longer in operation			
Howell-Flint Michigan	•							
Huron County								•
Kingston-Amherstview (Route 10)	•	•	•	•	•		•	•
Merrickville-Wolford- Ottawa*	•							•
North Glengarry- Ottawa	•							•
RideJaunt	•				•	Х		•
Ride Norfolk			•	•	•	Х	•	
Rural Transit Pilot Project (Kawartha Lakes)		S <u>https:</u>	ervice ceased af //kawarthanov	ter case stuc v.com/2019	ly completed in 2014; 9/04/24/white-light	Shopping bus rein	nstated in 2018. us-kawartha-la	kes/
Temiskaming Shores			•	•		X		•



#### 2. Do Identified Initiatives or Articles Discuss Cross-boundary or Rural-Urban Services?

While some cross-boundary transportation services have been developed --- and some are still in operation --- they are relatively few in number. Most of those discovered are in the United States.

Most community initiatives have emerged to address needs in a single community and usually in urban areas of significant size. Further, there are few rural-urban transportation initiatives in Ontario that cross municipal boundaries. The exceptions would be the North Glengarry-Ottawa service, the nowdefunct Merrickville-Wolford-Ottawa service. and Kingstonthe Amherstview service.

Several studies have identified reasons for the paucity of crossboundary services, including **lack of history working together** and "Many rural communities have evidenced real leadership in combining the travel resources of human service organizations and also opening such services to members of the general public. Despite these successes, transportation services in some of these same rural communities have been <u>unable to cross township, county or state</u> <u>boundaries</u> to coordinate transportation services with neighbouring communities."

Source: Burkhardt, J.E., Nelson, C.A., Murray, G., and D. Koffman. (2004). TCRP Report 101. Toolkit for Rural Community Coordinated Transportation Services. p. 14. Retrieved from http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp\_rpt\_101.pdf

challenges designing or creating services that are **financially sustainable** for funders.

There are some indications that the **transportation needs of rural residents are garnering more attention** from significant policymaking and funding bodies. Increasingly these organizations are posting Requests for Proposals that target their specific areas of interest rather than creating wide open competitions. For instance, the AASHTO Council on Public Transportation in the U.S. expects to fund a project in 2020 to address the role that transportation can play in assisting employers in finding workers and other economic factors.

The U.S. Federal Transit Administration created a <u>specific funding program</u> for rural areas and towns/cities under 50,000 population to "use or develop transit technologies and innovations that make services more cost-effective and efficient." Analysis of data in Appendix C of the Best Practices in Rural Regional Mobility Report revealed that of the roughly 850 grants provided through this program, one in five (22%) were "multi-county" initiatives. Fewer than 10 crossed a state boundary. The data for this analysis came from the U.S. Rural National Transit Database Report (2013). In some U.S. states (e.g. New Hampshire, Oklahoma, Tennessee, Vermont, and West Virginia), at least half of funding recipients reported having a multi-county service area.



A <u>state-wide transit planning study</u> carried out in Colorado in 2014, identified and mapped transit service gaps across multiple urban-rural boundaries (see following screenshot). This work included both an intercity and a regional bus network plan (with the latter having a greater focus on rural/small town communities. In particular, the following <u>definitions</u> may be useful for Eastern Ontario's purposes:

- Intercity Bus Service is regularly scheduled bus service that connects two or more urban areas, and serves passengers traveling long distances. It serves the general public, can transport passengers' baggage, and makes meaningful connections with national intercity bus service to more distant points. Intercity bus generally operates with only a few trips each day, but usually operates every day. Greyhound is a major provider of intercity services.
- Regional Bus Service also crosses jurisdictional lines, but may operate within rural regions
  or connect to an urban area. Regional services are generally 20 60 miles in
  length. Regional services are often geared around certain markets (e.g., workers or
  airport shuttles) and operate on schedules geared to these markets. Regional services
  may also be designed to serve people who need to travel long distances to access
  government services, medical trips, or other destinations. Some regional services
  operate only one to two trips each day while others have robust schedules.

Regional services in Colorado include many routes operated by RTD connecting suburban communities to the Denver CBD, services operated to resort communities, and services providing access to medical and other services.

The Colorado study selected four potentially transit-dependent population segments as the focus of their study (young adults, elderly/65+, persons living below the poverty line, and auto-less households). Notably, Colorado increased the age range for the youth category from <u>18-24 to 18-34</u> because other research data showed that this age group comprised three-quarters of their inter-city ridership. The study compared geographic locations currently served to locations that would have concentrations of people more likely to need public transportation. The analysis created population blocks based on a) <u>the density of potentially transit-dependent persons</u>, and b) the <u>percentage of potentially transit-dependent persons</u> in the population block.

Particularly for inter-city services, the Colorado study mapped the rankings for density and percentage of transit-dependent persons based on natural breaks (with some manual adjustment), to represent ranges of low, moderate and high relative need. Overall population density was also mapped to compare the ranked density of transit-dependent persons. The



study found that in large measure, the general population density map confirmed a correlation between the towns with high ranked densities of transit-dependent persons and those with relatively high overall densities. The planning also took into account the presence of facilities such as colleges and universities, military bases, hospitals, correctional facilities, airports, and tourist/ski resorts, since these could have a significant impact on potential ridership on services designed to fill transit gaps.

"While fixed-route transit service is often prioritized for areas that contain block groups with higher densities of potentially transit-dependent persons (ranking 1), it is also important to look at the percentage of the population with transit-dependent characteristics (ranking 2). Substantial percentages of transit-dependent populations indicate a high proportion of people who may need transit, though spread out over large areas" (Source: Colorado Transit Study, p. 3-3, TransitPlus Inc.)

The Colorado study found different patterns of utilization on regional services (both urban

and rural). "In the rural areas, any regional transit services developed around resort economies. Generally, such services were originally designed to meet the needs of employees travelling to and from work. People travelling to ski resorts for recreation area also an important part of the ridership in many corridors. While these systems may have begun catering to just the primary work trip, as they develop, they tend to serve as

"Across the State, the Census Transportation Data clearly shows that commuters are using transit for employment trips when it is available." Source: Colorado Transit Study (2014),

p. 3-20.

the primary mode of transportation for employees, many of whom do not own autos. Both the ECO and RFTA systems are good examples of this trend."

Analysis of resort employee ridership on existing transit services varied markedly among the major resorts --- from 4.8 to 26% of total workers. Often the percentage of workers using their own vehicles wasn't much higher. Parking costs at some resorts were viewed as a deterrent to own-vehicle travel (p. 3-19).



The Colorado analysis revealed three distinct sub-markets for regional and inter-city transit:

- Regular-Route Intercity Bus Service (typical non-peak, longer distance, for social or recreational purposes; connections with the national intercity bus network are important).
- Commuters: characterized by weekday, daily services with a <u>peak-hour schedule</u> <u>orientation</u> in several regions in Colorado. The Colorado services primarily addressing this market are located in the regions that contain relatively large population centers or <u>produce enough demand for a</u> <u>population center to serve as a destination</u>. The Denver RTD operates a number of commuter bus services (the Boulder and

"It is worth noting that ridership in ECO Transit and RFTA both declined significantly in the recession years, reflecting how closely system ridership is tied to commuter transportation. With job reductions, ridership declined and then service was cut. Ridership and service is only now starting to build up again. For example, ECO Transit carried 3,300 riders daily in 2008 and 1,900 riders daily in 2011, over a 40% reduction in ridership."

> Source: <u>Colorado Transit Study (2014)</u> Appendix C: C-3

Longmont routes in particular) that augment or replace intercity services. The <u>lack of</u> <u>affordable housing</u> in a number of the resort communities has also led to the creation of long-distance commuter services that permit resort-area workers to live in other towns that have more affordable housing opportunities, as can be seen in the RFTA and ECO services.

 Airport Service: seen as having <u>potential to grow</u> in Colorado; demand-response mode; typically <u>disconnected</u> from either commuter services or traditional inter-city bus networks.

The following map shows the results of geospatial gap analysis (comparing likely demand for service to the existence of services, and identifying areas of demand where there are currently no services). By presenting the gap analysis in map form, it is possible to begin thinking about what new gap-filling services might look like (ex. Routes and communities connected by a particular service). The idea of presenting geospatial information is being used in the 'Commuter Strategy' project.





*Figure 1 - National Academies of Sciences, Engineering and Medicine. (2017). Best Practices in Rural Regional Mobility, Washington DC: The National Academies Press. Retrieved from <u>https://doi.org/10.17226/24944</u>.* 

**Methodology for Determining Service Demand**: The Colorado study used a four-step methodology to determine the demand for regional transit services along two corridors by:

- Reviewing historic ridership and service trends
- Estimating mode share from journey-to-work data and considering qualitative and market factors in estimating mode share for proposed services.
- Identifying population and employment forecasts to determine how ridership might grow through 2040
- Applying factors to estimate ridership for specific service plans.



#### **Case Studies of Rural Transportation Initiatives:**

To date, most rural-urban transportation initiatives for commuters (workers) are not considered cross-boundary (meaning they do not provide services across municipal boundaries). In the Canadian context, the closest initiatives that would be considered cross-boundary would be Deseronto Transit, which runs back and forth between Napanee and Deseronto, and Kingston Transit's service to Amherstview (which is in Lennox and Addington County). There are two known initiatives in the U.S. that cross municipal boundaries: one is known as Ride JAUNT, which runs across municipal boundaries in South Carolina. The second is the inter-city/regional bus service run by the State of Colorado and contracted to Greyhound. Note: most of the initiatives seem to consist of hub spoke or corridor models, with the exception of Ride JAUNT which is an on-demand service. The City of Belleville is now operating a <u>highly-successful night time on-demand</u> bus service within the city limits.

**The Corridor 11 Bus:** 125 km stretch of HWY 11 corridor between Huntsville and the north end and Barrie at the south end (Rural Ontario Institute, 2014 b).

**Deseronto Transit:** Napanee, Bloomfield, Tyendinaga Territory, Tyendinaga Township and Deseronto (Rural Ontario Institute, 2014 b).

**Ride JAUNT:** JAUNT, Inc. is a <u>regional public transportation system</u> providing service to the citizens of Albemarle, Fluvanna, Louisa, Nelson, Buckingham, and Amherst Counties, as well as Charlottesville, USA. Organized in 1975, JAUNT is recognized statewide and nationally for the high quality of its efficient service and driver training. Over 300,000 trips each year throughout a 2,600-square-mile service area (see <u>www.ridejaunt.org</u>)



# **Studies/Surveys on People Accessing Transportation:**

Five of the studies/surveys reviewed conducted cross-boundary analysis, including several that conducted or consolidated ridership studies across Canada.

✓ Across Canada Ridership (Miller, Shalaby, Diab, and Kasraian, 2018); ridership survey respondents (transit authorities) are show in the following chart:

Count	Transit agency	Within the 10 largest agencies	Count	Transit agency	Within the 10 largest agencies
1	Airdrie Transit	No	19	North Bay Transit	No
2	Barrie Transit	No	20	OC Transpo	Yes
3	Brampton Transit	No	21	Peterborough Transit	No
4	Calgary Transit	Yes	22	Réseau de transport de la Capitale	Yes
5	City of Hamilton	No	23	Ride Norfolk	No
6	City of Moneton	No	24	Saint John Transit Commission	No
7	City of Red Deer Transit	No	25	Sarnia Transit	No
8	Durham Region Transit	No	26	Spruce Grove Transit	No
9	Edmonton Transit	Yes	27	St. Catharines Transit Commission	No
10	Fort Sask Transit	No	28	STM	Yes
11	Grand River Transit	No	29	Stratford Transit	No
12	Grande Prairie Transit	No	30	Strathcona County Transit	No
13	Greater Sudbury Transit	No	31	Thunder Bay	No
14	Guelph Transit	No	32	Toronto Transit Commission	Yes
15	Halifax Transit	No	33	Winnipeg Transit	Yes
16	Kingston Transit	No	34	York Region Transit	No
17	Lethbridge Transit	No	35	TransLink	Yes
18	Mississauga Transit	Yes	36	Prince Albert Transit	No

Table 2-1: List of responding agencies



Figure 2-1: Surveyed transit agencies

Figure 2 - Source: Miller et al, 2018, p. 78



✓ Telecommuters in Southwestern Ontario (Hambly and Lee, 2019); article refers to Southwestern Ontario generally. When discussing the measurement of telecommuter benefits, Hambly and Lee refer to the "SWIFT area" (a high-speed internet/broadband project for this region including Niagara region and Caledon. The following chart shows average daily commutes in distance (kilometres) rather than time (minutes).



Figure 3 - Source: Hambly and Lee, 2019, p. 282



Transit Ridership Canada (Curry, 2017); focused on cities across Canada including Halifax, Montreal, Ottawa, Toronto, Saskatoon, Calgary and Vancouver. More indepth discussion for Montreal, Ottawa (OC Transpo), Toronto (Toronto Transit Commission), Greater Toronto Area (Go Transit), Calgary (Calgary Transit), and Vancouver's Translink.

			Commuting tim	e	
	Average	Less than 15 minutes	15 to 29 minutes	30 to 44 minutes	45 minut or more
	minutes		perce	ntage	
Total Canada Type of region of residence	26	30	33	19	17
Census metropolitan areas of 1,000,000 or more residents†	30	19	33	25	23
Census metropolitan areas of 250,000 to 999,999 residents	25*	29*	38*	18*	15*
Census metropolitan areas of less than 250,000 residents	19*	41*	39*	13*	7*
Census agglomerations	19*	49*	31	11*	10*
Outside of census metropolitan areas and census agalomerations	23*	41*	29*	15*	15*
Census metropolitan area					
Taranto†	33	15	33	25	27
Montréal	31	20	27	27	27
/ancouver	30*	22*	33	25	21*
Ottawa—Gatineau	27*	15 <sup>E</sup>	50*	21	14 <sup>E</sup>
Calgary	26*	21 <sup>E</sup>	33	29	16 <sup>E</sup>
Edmonton	23*	27*	41	20	12 <sup>E</sup>
Mode of transportation					
Car or private vehicle†	24	31	36	18	15
Public transit	44*	5*	21*	30*	43*
Active transportation (walking or cycling)	14*	57*	27*	14*	F'
Type of region and mode of transportation					
Census metropolitan areas of 1,000,000 or more resid	lents				
Cat/private vehicle†	27	21	37	24	18
Public transit	44*	51*	20*	31*	44*
Census metropolitan areas of 250,000 to 999,999 res	idents		10	17	10
Cat/private vehicle†	23	31	40	1/	12
Public transit	46*	F*	25**	29**	42*

Table 1 Average commuting time to work and proportion of workers, by selected characteristics, 2010

- ✓ General Social Survey Canada (Turcotte, 2010); focused on major metropolitan areas and CMAs that include urban and rural areas. See following table on commuting:
- ✓ General Study on Canada's Ridership (Canadian Urban Transit Association, 2019); short news article; discusses Canada generally; Note: CUTA collects data from more than 100 conventional transit systems and more than 70 specialized transit systems across Canada.



3. Does the Literature Suggest that Ability to Pay Was a Consideration? Or the Ability to Pay for Transportation Because of Low-Income Status or Low Wage Jobs?

None of the reviewed literature explicitly notes the ability to pay as an issue <u>because users</u> <u>were retired</u>, <u>low-income status or because their jobs did not pay enough</u>. Most *case studies* simply note the need for accessible and affordable transportation (in situations where there were no transportation options in their areas), usually defining affordable in relation to (lower than) taxi rates. While understandable, this approach overlooks the opportunity to explore whether this is the only relevant definition of affordable (does affordable depend on distance?), whether there are others who might supplement any rider contribution (e.g. family or agency), or whether commuters or their employers might be contributors to the overall financial sustainability of a service. It is not clear from the available literature that long-term affordability of the service to the operator/funder has received significant consideration in planning for these services.

#### **Case Studies of Rural Transportation Initiatives:**

#### ✓ Community Care Northumberland

Indirect reference to ability to pay being important: "the goal of the service is to offer rural transportation within out County that is affordable, accessible, and sustainable for all residents of Northumberland County." (Rural Ontario Institute, 2014 b, p. 18).

✓ **The Corridor 11 Bus** (Rural Ontario Institute, 2014 b, p. 27).

Might assume, given that it mentions "year-round residents struggle to make ends meet on lower than average income and high housing costs" Rural Ontario Institute, 2014 b, p. 29). Also mentions: Among the priority populations requiring greater service were: Low-income individuals, including those who are eligible for support from Ontario works..." (p.30).

✓ Deseronto Transit (Rural Ontario Institute, 2014 b, p. 35).

"Like other rural areas within Ontario, the lack of affordable and accessible public transportation options affects everyone, but it is a particular challenge to people with low incomes, the elderly, people with disabilities, and families with children" (p. 38). "Statistics revealed that, in 2006, 40.6% of residents in Deseronto were in receipt of social assistance payments. for these individuals, transportation was identified as a barrier to accessing necessary supports and services, employment and education opportunities, as well as basic daily living need" (p. 39). Also assessed the impact of increased transportation on individuals needing social assistance: "By the end of the


funding period [pilot project funding] in December 2007 there were 70 job placements obtained and 30 clients no longer needing social assistance" (p. 39).

### **Studies/Surveys on People Accessing Transportation Services**

**Focus On Youth**: Much of the available literature focused on the needs of young people; for them, lack of access to work or limited work opportunities was a significant issue. The need for accessible, affordable and consistent transportation was also noted (Lu, 2016, 13). Other obstacles included: the cost of living is greater than earnings which affected how/where young people lived and how accessible work was (Lu, 2016, p.13).

**Cost/Accessibility of Transportation is an Issue for Many Populations**: Both Fraser (2012) (focus: Ottawa) and Marr (2015) (focus: Huron County) note that cost and accessibility of transportation (affordable options) are issues for rural residents in these areas. These transportation barriers can be particularly acute for youth, women, older people, persons with disabilities, victims of violence, and others living on low income. Again, the high rates of taxi fares were mentioned (Marr, 2015)

**Implications**: There were some indications in the literature that lack of access to transportation contributed to a sense of social isolation and can cause residents to leave a community. There are also indications that affordability of transportation is influenced by income and overall cost of living --- especially housing. For instance, Marr (2015) mentions issues of social inclusion/ exclusion are mentioned: "One important accessibility need is access to social inclusion opportunities. These include social activities such as visiting friends and family, attending cultural or religious events, participating in civic functions, and participating in recreational or leisure activities, among others" and notes that "without transportation access rural residents are particularly at risk of social exclusion" (p.104). Fraser (2012)- mentions social exclusion: "Access to affordable transportation means rural youth can find jobs, do volunteer work, and participate in meaningful recreational activities. Without these opportunities, rural youth, especially those who are already at-risk, will not develop employability skills or a connection to their communities" (p. 17).

**Lu Study (2016) (Focus: Youth):** According to Lu (2016) The numerous case studies related to rural communities have illustrated similar issues across different regions of Ontario and Canada. Many of these studies noted that challenges faced by youth are that <u>the cost of</u>



living is greater than earnings, the absence or limited public transportation, geographically underserviced areas, and insufficient public or government support programs. Youth and young adults lack affordable housing which results in them having to live with their parents whom may or may not be retired, living in secluded locations for economic reasons, and may or may not possess a motor vehicle for transportation. It appears that individuals who do not have transportation for school or work generally do not attend school or work, or would commonly work at a local position earning close to minimum wage (Lu, 2016, 13).

Lanark (Focus Youth): The findings of the 2016 study in Lanark County, as represented in informant interviews, are similar to those in the Lu study. Survey respondents who had <u>moved out</u> of Lanark County agreed that they had faced transportation issues when living in the County, and that the primary reasons for their move were access to education or transportation, although other reasons included:

- Less socializing due to lack of transportation
- Moved for employment/ limited local work options
- Difficult to get around without a car, especially in winter (Lu, 2016).

For survey respondents <u>presently living</u> in Lanark County, the major purposes of transportation were: to attend post-secondary education, to travel to work, for recreation/ leisure. For all of these activities, the dominant methods of transportation were consistent: driving oneself using a car or motorcycle, someone else drove / carpooled, walked. A very small number indicated that they cycled or used taxis.

The majority of survey respondents selected "Completely Agree" with the following statements:

- I am considering moving to a bigger city for employment opportunities
- I would go to College / University if there were adequate public transportation options
- Options for work are limited because I do not have adequate transportation

According to the key informant interviews, the major issues facing local youth and young adults include:

- Limited labour market / job opportunities in their home community
- Limited transportation options /no public transportation for work or other activities
- Lack of affordable housing
- Lack of social opportunities (recreation)
- Lack of education and training.



Addressing the Issues: Informants were also asked their opinions regarding how to address these issues or minimize the impact of these problems. Responses emphasized these themes: provide consistent, <u>affordable</u>, accessible transportation that would reduce barriers related to services, employment, and education and would increase opportunities for socialization and improve the quality of life of youth and young adults (Lu, 2016, p.13).

**Ottawa (Fraser, 2012) Emphasis on Youth Accessibility to Services and Work:** This report described transportation options for residents of rural areas in Ottawa: rural routes operated by OC Transpo, transportation coordinated by community services, and personal vehicles. However, a number of barriers still exist including <u>cost and accessibility</u> <u>of transportation</u>. These transportation barriers can be particularly acute for youth, women, older people, persons with disabilities, victims of violence, and others living on low income (Fraser, 2012).



### Disadvantaged groups in Huron County (Marr, 2015):

Huron County (Focus: Youth): In this study, youth were identified as a disadvantaged group. In addition to being able to get a driver's license, other obstacles may still exist for youth associated with licensing conditions (e.g., inability to drive alone) as well as vehicle access and affordability (Herold & Kaye, 2001) (Marr, 2015, p.103). Some key accessibility gaps were also identified: transportation to access employment, and transportation to access social inclusion and recreation opportunities, beginning particularly around the age of 10 where independence becomes important. For these accessibility needs there are no services available aside from taxis which are often very costly. Marr also noted that "Finally, it was also identified that some youth are living independently in Huron County and therefore require access to additional needs such as food or shelter as emphasized in the following quote: There are some young people that, for a variety of reasons, are living completely independently. And those are the ones that require the most support. What happens is that they move to rural areas due to the affordability of rent. So often these are old farmhouses in the middle of nowhere and once there it really limits their ability to access any kind of resources (Interview Participant # 6). This emphasizes a reality (often overlooked in rural areas) that some young people may be living outside their family homes. These individuals may be expected to have a different set of needs, presumably more closely associated with those on low-income than with other youth living with their parents or other adult caretaker" (p. 113).

**Huron County (Focus: Low-income Households** (regardless of definition): Low-income households were identified as a disadvantaged group. Difficulty affording the high costs of vehicle purchase and operation, and thus be <u>deprived of transportation for primarily financial reasons</u>, though additional reasons may also compound the issue (Senate of Canada, 2008). For instance, one study found that low-income households often exhibit a "range of transportation problems that reflect a lack of driving skills, inability to obtain a valid driver's license, lack of access to consumer credit, as well as the high costs of insurance, maintenance, and repairs" (Fletcher, Garasky, Jensen, & Nielsen, 2010, p. 140) (Marr, 2015, p.103). Low-income households, individuals, or the rural homeless may also be reliant on local networks of family or friends that may make them unable, or unwilling, to relocate to urban areas where public transportation may be available (Cloke, Milbourne, & Widdowfield, 2003) (Marr, 2015, p.103).

This research also found that (drivers) licensing was frequently an issue for members of low-income households. For instance, interview participants noted that they often had



clients who had lost their driver's license due to driving offences, or had large fines prohibiting them from renewing their licenses. Study interviewees identified multiple factors that may limit their group's mobility including: "Lots and lots of our clients do not have transportation". "They just don't have enough money to have a car or they've lost their license and don't have money to get it back." "People have ID issues where they cannot collect back the ID they need. They don't have enough money to pay the fees required." "So, for whatever reason the majority of our clients do not have transportation". The study found that transportation assistance did exist within Huron County to support those with low-income in accessing essential services (i.e., healthcare), education and training, as well as <u>pre-employment support</u>. A key gap emerged, however, with regard to post-employment access to workplaces on a regular basis once <u>employment is attained (Marr, 2015, p. 114)</u>.

**Huron County (Focus: Women in Rural Areas)**: This study summarizes a significant pool of literature indicating that women living in rural areas are often at risk of transportation disadvantage. Notably, not all women in rural areas are at risk of transportation disadvantage, but considerable research has shown that women living in non-car or single-car households often are transportation-disadvantaged, and in particular mothers with young children (Fuller & O'Leary, 2008; Garven & Associates, 2005; Gray et al., 2001; Maar et al., 2013; O'Leary, 2008; Senate of Canada, 2008).

The underlying cause of this transportation disadvantage among women is often related to limited vehicle access. Unlike older adults, youth, and those with disabilities, women in rural areas may be able to drive in legal and physical terms, but simply lack access to a personal vehicle in order to do so. In addition, women's transportation disadvantage has also been associated with their standing within the household, where their transportation needs may be seen as secondary to the needs of the main wage-earner (often a male member of the household), particularly when there is only one vehicle (Marr, 2015, p. 103).

In the EOLC's 'Commuter Strategy' project, it may be useful to explore whether women would respond favourably to commuter transportation options --- whether they have a personal vehicle or not. It may also be useful to examine closely whether the City of Belleville's on-demand night-time bus service is differentially used more by women than men.

**Ottawa Commutershed Bus Service Article (Focus: Commuters)** A 2019 Ottawa Citizen article highlighted the cancelation of Ottawa's only rural public transportation service, addressing transportation needs along a route including North Augusta, North Grenville,



and Merrickville-Wolford areas into Ottawa, ending in December 2019. The bus was described as one of the <u>few affordable options</u> for area residents travelling into Ottawa. "It's important for seniors, students, people without a car" (Carroll, 2019). One commuter noted: "because it is an affordable option- \$10 in each direction- and eliminates stress" (Carroll, 2019).



### 4. Are there Indications of Pre-Pilot Demand Data Gathering/Analysis?

None of the case studies or the studies/ surveys reviewed referred to collection of any "pre-trial" or "pre-pilot" demand data, at least not directly. In fact, pilots may have been suggested as a way of collecting demand data before longer-term decisions were made. The literature reviewed did not report on any of this type of data but it may well be available with further enquiries. Examples could be Colltrans Collingwood-Wasaga Beach and Collingwood Blue Mountain Transit Links, Ride Norfolk and Haliburton Rideshare.

Since demand data is important to the long-term financial sustainability of any transportation service, and the service's ability to reduce/remove a barrier to accessing employment, the EOLC's 'Commuter Strategy' project should include this as a significant requirement before proceeding to the pilot project stage. This question is linked to several other questions explored in the Literature Review, including factors that can shift driver behaviour toward alternative forms of transportation, and the degree to which costs to riders is a deterrent to service utilization.

### **Case Studies of Rural Transportation Initiatives:**

**Colltrans Collingwood- Wasaga Beach and Collingwood Blue Mountains Transit Links:** pilot projects were initiated but no evidence of demand data (Rural Ontario Institute, 2014 b).

**Ride Norfolk:** Ride Norfolk has its roots in transportation studies and needs analyses going back to the early 1990s and a public transportation pilot project which operated from 1997-99, then another series of studies from 2008 to 2010 (Rogers and Leitch, 2016, ?).

**Haliburton Rideshare:** note there is no evidence of data collection, however, the termination of services note mentions that research and consideration of the needs of Haliburton County was conducted before the initiative was implemented (Rogers and Leitch, 2016, p. 23).

(see <a href="https://www.transportationhaliburtoncounty.ca/haliburton-rideshare-wrap-up/">https://www.transportationhaliburtoncounty.ca/haliburton-rideshare-wrap-up/</a>).



**5.** Do Identified Initiatives/Articles/Surveys Refer to Operating Costs? (Cost Per Km/Mile or 'Per Hour' Are Helpful).

Several of the case studies did include overall cost data, fare prices and sources of revenues. However, this data is not presented in a form that would be useful for estimating operational costs of a service in 2020, nor what the rider fares would likely be. This information will need to be collected in a subsequent phase of the 'Commuter Strategy' project, that focuses on consultations with potential transportation service suppliers to obtain operational --- and potentially capital --- cost data that could be used to estimate the financial sustainability of any envisioned service. This analysis would be part of the 'modelling' component of the project.

### **Case Studies of Rural Transportation Initiatives:**

### Cost of Running Services:

Several of the case studies reviewed noted the actual cost of running their services (the annual operating budget):

- ✓ Deseronto Transit (2013): \$330,000 per year
- ✓ City of Kawartha Lakes (2015) \$420,000 per year
- ✓ Temiskaming Shores: (date unknown): \$550,000 per year

### **User Price:**

Several of the studies noted the cost of fares/ price for users:

- ✓ Colltrans Collingwood- Wasaga Beach and Collingwood Blue Mountains Transit Links: a single fare is \$2.00. Monthly passes are \$40.00. A Universal Transit Pass \$120 per month which allows unlimited access to the Link, Wasaga Beach Transit and Colltrans.
- ✓ Deseronto Transit: Fairs based on regional distance and range from \$6.50 to \$12.00.
- ✓ Ride Norfolk: Fares cost \$2.00 for intown rides and \$6.00 each way when travelling between towns
- ✓ City of Kawartha Lakes Rural Transit Pilot Project: \$5 dollars per ride.
- ✓ Temiskaming Shores: Fares are \$2.75 per ride but there are senior and student discounts as well as books of tickets which reduce fares slightly.

### Sources of Revenue:

Where sources of revenue were indicated (beyond rider fares), they were typically municipal governments, town councils and provincial gas tax dollars. Some cases also included non-profit organizations, fundraising and donations.



**Coltrans Collingwood- Wasaga Beach and Collingwood Blue Mountains Transit Links:** The service is coordinated in partnership between the towns of Collingwood and Wasaga Beach. The bus was purchased and is run by Sinton Transportation. In addition to individual and monthly fares, the program benefits from monthly passes purchased by Ontario Works (Simcoe County). Provincial gas tax dollars help fund the Transit link but is a relatively low source of revenue.

**Community Care Northumberland:** Operating costs include wages and benefits for staff and drivers, cost of fuel, license and maintenance. Example: average trip of 25 minutes costs approx. \$28.00 per rider. The bulk of the cost of operating the service is obtained from the Township of Cramahe, Township of Alnwick-Haldimand and the Municipality of Trent Hills (municipal budgets and gas tax benefits). Also supported by Central East LHIN, Northumberland United Way, Northumberland County and municipalities, ridership, fundraising and donations. No exact cost listed (Rural Ontario Institute, 2014 b, p. 25).

**The Corridor 11 Bus:** owned and operated by Hammond Transportation- private. Exact cost unknown.

**Deseronto Transit:** Funding provided by the Town of Deseronto, the Town of Greater Napanee, Tyendinaga Township, Hastings County, The United Way of Quinte, Prince Edward and Lennox and Addington Social Services and the provincial gas tax program. Overall operating budget as of 2013 was \$330,000. Individual fairs are based on regional distance and range from \$6.50 to \$12.00 (Rural Ontario Institute, 2014 b, p. 42).

**Ride Norfolk:** Operating Costs and Revenues: "Fares cost \$2.00 for intown rides and \$6.00 each way when travelling between towns This provides only a small portion of the funds required to operate the service. In its first year of operation, the cost to the municipality was \$334,941, but by 2013 it was reduced by 64% to \$95,000. This reduction was due to offsets from the provincial gas tax fund and a change in carriers that resulted in significant savings. In 2013, the offsets by the gas tax amounted to \$45,000, and ridership revenues accounted for \$18,000" (p.74). There is a reference to the service not being financially sustainable: "there can be no expectation that the service will come close to self sufficiency; it must be accepted as a vital public service that warrants public funding" (Rural Ontario Institute Case Study)<sup>iii</sup>. Considerations are underway (as of 2013) to combine several services together to create a collaborative, integrated transportation service and charge riders \$0.45/km (See Rural Ontario Institute, 2014 b, p. 75).



**City of Kawartha Lakes Rural Transit Pilot Project:** The total cost to provide the rural transit service — including running the buses, advertising, signage, and staffing — was just over \$420,000 annually (kawarthaNOW, 2015). The pilot project was funded through the Ontario (provincial) Gas Tax program, which provided 96 municipalities with \$325 million in 2014/15 to make it easier for people to use public transit by increasing accessibility, buying more transit vehicles, adding more routes, and extending hours of service.

The City of Kawartha Lakes received \$590,645 under the program. Since there is no guarantee the Gas Tax program will continue in the future, any rural transit service in the City of Kawartha Lakes would need to be funded through municipal tax dollars. Passenger revenue alone is insufficient to fund the service (ridership was around 10,000 in 2014 at a cost of \$5 per ride) (kawarthaNOW, 2015).

**Temiskaming Shores:** Fares are \$2.75 per ride but there are senior and student discounts as well as books of tickets which reduce fares slightly. Temiskaming Transit reported 130,000 to 140,000 rides per year in 2014 and 2015. The transit system costs about \$550,000 per year to operate and the City of Temiskaming Shores subsidizes the system approximately \$150,000 per annum with a contribution from the Town of Cobalt of about \$25,000 per annum. The other revenue sources are primarily fares, the gas tax rebate, and advertising. (Rogers and Leitch, 2016, p.24). http://www.temiskamingshores.ca/en/resident/transit.asp

**RideJAUNT:** uses local, state, and federal funding to supplement fares and agency payments (see <u>www.ridejaunt.org</u>). No further information is given on their website.



6. Do Any Case Studies, Articles or Surveys Discuss Aggregation of Demand? (Adding the demand for transportation services from multiple disadvantaged groups together to get a financially sustainable business model).

A number of case studies cite that initial research and pilot projects were conducted, but none (neither the case studies or survey/studies) explicitly refer to aggregation of demand in their planning work or pilot projects.

For the purposes of the 'Commuter Strategy' project, this finding is highly significant for two reasons: first, it indicates that there may be limited data on commuter demand with or without the demand from other transportation-disadvantaged groups (ex. Seniors, youth etc.). Secondly, 'Commuter Strategy' consultations will need to quantify each of these 'market segments' to see if adding other segments beyond a service designed to service commuters has any impact on the financial sustainability of a commuter service.

"In contrast to within-city studies, fewer studies can be found in the literature that estimated changes in ridership across different cities and regions or used a city-wide transit system as the unit of analysis. These city level or multi-city studies are less common for several reasons including data limitations and modelling complexity. However, these studies can help with the identification of major trends and the generalization of results, overcoming the problem of external validity related to the use of limited-scale case studies. Therefore, the findings from these studies are considered applicable to other study areas. In our systematic literature review, we were able to identify 11 studies that used data from more than one city and transit agency or used citywide data as the unit of analysis... Four of the 11 studies used data for specific routes or stations from different cities in order to understand the common determinants of transit ridership... Guerra and Cervero (2011) combined investment and station-level data from 50 fixed-guideway transit projects on 23 transit systems in the U.S. to investigate the influence of job and population densities on transit ridership.."

Source: Canadian Transit Ridership Trends Study, CUTA Final Report, October 2018, p. 8, (Miller, Shalaby, Diab, and Kasraian)



## 7. Do Case Studies/Articles/Surveys Comment of Time-to-Sustainability? (e.g. Length of Time for A New Service to Achieve Consistent and Sustainable Operation)

In most case studies, there is little to no indication how long it took rural transportation initiatives to reach successful operations. There are however two exceptions: Deseronto Transit, which cites 10 months to success (March to Dec 2007) and Colltrans Collingwood-Wasaga Beach which cited 2 years (Aug 2011 to 2013) along with Collingwood Blue Mountain Transit Link which cited seven months (Nov 2013 to May 2014). Note there is no indication of length of time to get to success indicated in the survey/studies.

### **Case Studies of Rural Transportation Initiatives:**

**Colltrans Collingwood- Wasaga Beach and Collingwood Blue Mountains Transit Links:** The Collingwood-Wasaga Beach Transit Link pilot started on August 12, 2011 and was running as of 2013. The Collingwood to The Blue Mountain link began its pilot in November 2013 and conclude in May 2014. Their website indicates both lines are still running (see <u>https://southgeorgianbay.ca/regional-public-transit/</u>).

**Deseronto Transit:** March 2007 grant received and by December 2007 `this pilot was not only a success, it exceeded expectations. As a result, the town of Deseronto decided to continue to support the service and make it available to the general public (Rural Ontario Institute, 2014 b, p. 39).

**Ride Norfolk:** Began in 2011... still running but not financially sustainable on its own. "There does not appear to be any changes on the horizon at present that will affect Ride Norfolk. It is as stable as it likely ever will be. the budget is always a concern, but as long as there are no drastic changes to the county's economy, it is likely that there will continue to be sufficient support for the bus to continue to operate" (Rural Ontario Institute, 2014 b, p.76).

**Haliburton Rideshare:** did not achieve success after running for several years<sup>iv</sup>. (Service discontinued). "There are no set fees but riders are encouraged to pay the driver a reasonable amount" (Rogers and Leitch, 2016, p. 22). There is a reference in the literature to the lack of financial sustainability of this initiative and it has been discontinued: "The main challenge faced both during the development of the bus service and on an on-going basis is the economic reality of providing an affordable public transportation service in a very low-density area. There can be no expectation that the service will come close to self-sufficiency; it must be accepted as a vital public service that warrants public funding. This attitude, however, has not been adopted by all residents in the county. The service



has been panned by residents who do not share the RNTC's priorities and have unrealistic expectations for ridership and cost recovery. It is inevitable that in operating a fixed route service there will sometimes be an empty bus on the road, whether on its way for maintenance, coming out of service or on a slow day. However, there are frequent comments made about an empty bus travelling around the county" (p. 74-75)

**City of Kawartha Lakes Rural Transit Pilot Project:** The pilot project took place for two years and came to an end in 2015. The decision to end the project was based on the ridership numbers and the cost of providing the service. Council felt that it "could not justify the expense of this service"<sup>v</sup>. The program was discontinued due to low ridership and uncertainty about the future of provincial subsidies (Rogers and Leitch, 2016, p. 23). Note this project was also referred to as Dial-a-Ride.

**RideJAUNT:** Has been successfully running since 1975! No information on implementation to success timeframe.



8. Does the Literature Mention Marketing/Communications/Promotional Tactics Deployed to Promote Services or Encourage Ridership?

#### **Case Studies of Rural Transportation Initiatives:**

None of the case studies reviewed in the course of this project mentioned specific marketing/ communications tactics used by 'pioneer communities' to advertise rural transportation initiatives. A **Lanark County survey/study**, conducted by Rogers and Leitch (2016), did note that among those it surveyed in the county, there was concern about the lack of information about transportation options (p. 14).

**Ride Norfolk:** A three-year grant was received from the Ontario Trillium Foundation to purchase and provide training on the service's scheduling software as well as funds for marketing the program. Haldimand and Norfolk's Women's Services is the agency that is hosting the grant for integrated services. Rotary Club and United Way, sponsored a week of free bus rides as a marketing promotion. Consideration has been given to raising funds by providing advertising space on the bus, but because they do not own the bus, they would need to work with the contractor to determine income splitting and acceptable advertising (Rural Ontario Institute, 2014 b).

Halliburton Rideshare: acknowledged the need for better promotional activities and outreach (see <u>https://www.transportationhaliburtoncounty.ca/haliburton-rideshare-wrap-up/</u>). (Service discontinued).

### **Studies/Surveys on People Accessing Transport:**

**Lanark:** Rogers and Leitch (2016) among the common themes raised from surveys, consultations and interviews there were many concerns about the lack of information about transportation options and how to access them, including frequent questions about what Lanark Transportation Association offers and how to access its services (p. 14).



# 9. Does the Literature (Studies/Articles/Surveys) Describe Factors Leading to Travel Mode Shift? (e.g. getting out of a car into other forms of transportation).

The literature suggests that a large number of factors influence transit ridership (see table from Canadian Transit Ridership Trends Study, 2018 on a following page). Note that the

CUTA collects ridership data from 100+ conventional transit systems and 70+ specialized transit systems across Canada. CUTA's comprehensive industry data program has operated for over 30 years, gathering over 1,300 data points from each transit system. These systems represent over 98% of ridership in Canada.

The sheer number of factors, grouped together into four categories, suggests that significant research and consultation is warranted as part of any transportation service design process, and that consideration needs to be given to identifying 'clusters' of characteristics required to attract riders for specific types of services. It may or may not be possible to design a service for one target

"A common problem indicated by the authors of the above city level and multi-city studies is the high level of correlation predictor among variables within each city, which limited their investigations... The multi-collinearity problem, or the high degree of correlation among explanatory independent variables, usually occurs among various spatial variables, transit-service variables, and between spatial and socioeconomic variables."

Source: Canadian Transit Ridership Trends Study, CUTA Final Report, October 2018, p. 8, (Miller, Shalaby, Diab, and Kasraian)

audience and expect that it would appeal to other groups.

For the purposes of the 'Commuter Strategy' project, it may be possible to gain some insight from the few similarly-focused transportation services identified through the Literature Review. It may be possible to obtain some data that can be used for design purposes then structure observational or rider survey research to validate hypotheses in the early months of the pilot project phase of the project.

## Studies and Surveys on People Accessing Transit (Not Necessarily Other Transportation Services):

The following synopsis identifies the general types of factors that influence behavioural change with respect to transit ridership; these should be kept in mind when designing any new service in Eastern Ontario. Common themes that would affect/increase ridership include: investing in improving the transit service (more convenience or improved service)



levels), reducing the associated cost of using transit, reduced travel times, lower gas prices, etc.

- Study by Canadian Urban Transit Association (2019) "Canadian transit ridership continues to trend upwards": Transit ridership grew in 2018 in Canada to an all-time high of 2.16 billion passenger trips, according to the Canadian Urban Transit Association (CUTA). The increase to 2.16 billion trips equates to a growth in ridership of 50 million linked trips taken by passengers on Canada's transit network a 2.4% jump from 2017. Systems reporting ridership growth commonly identify an increase in service levels as a key enabler of this growth. Factors that contribute to increased service levels include more vehicle revenue hours, better efficiency and reconfigured routes. Research commissioned by CUTA suggests that for every 10 per cent increase in vehicle revenue hours that a transit system provides, a 10 per cent increase in ridership is expected. Most of the operational investments made by transit systems go to increasing vehicle revenue hours (Canadian Urban Transit Association, 2019).
- A Year Earlier: Stagnating Transit Ridership Had Officials in Canada Stumped: Globe and Mail articles noted that in 2016-2017, transit ridership across Canada was stagnating. Lower numbers mean less revenue, leading to budget shortfalls. Observers expressed uncertainty over what was going on (why the decline or at least modest growth?). Reasons cited across the country included the <u>state of the economy</u>, <u>gas prices</u>, <u>increased</u> <u>incidence of working from home/telecommuting</u>, <u>growing popularity of other</u> <u>transportation options</u>, and <u>lack of employment growth</u>. Go Transit in the Greater Toronto Area cited the need for more frequent services and faster travel times (Curry, 2017).
- Changes in Ridership- Casual Factors and Ridership, and Decline in a Transit System: The final report of the "Canadian Ridership Trends Research" project presented the overarching results of project findings against its objective: "to conduct an in-depth study on current and future conventional ridership trends through research and consultation with transit systems" which is "to provide an understanding of the <u>correlation between</u> <u>causal factors and ridership in Canada and provide explanation(s) of ridership decline at a transit system</u>, Census Service Area (CSA), and national level (Miller, Shalaby, Diab, and Kasraian, 2018). The report stated that:
  - Transit agencies and municipalities can improve their ridership by investing in improving the transit service as well as by reducing the associated cost of using transit (i.e., fares) (Miller et al., 2018, p. 88).



- As expected, economic factors, in terms of gas prices, are also associated with transit ridership. More specifically, <u>increases in gas prices contribute positively to</u> <u>increasing transit ridership.</u> With the improvements in private automobiles fuel efficiency (which reduces the amount of money spent on gas), higher increases in gas and carbon taxes (e.g., to fund the public transit service) would help encourage higher transit ridership across Canada (Miller et al., 2018, p. 89).
- Commuting to Work, Results of the 2010 General Social Survey: According to the 2010 General Social Survey, commuting takes longer by public transit than by car (Turcotte, 2010). How someone gets to work is associated with <u>how long it takes to get to work</u>. Public transit riders take considerably longer to get to work (44 minutes compared to 22 minutes for those who walk or bike) (Turcotte, 2010, 26).

The 2010 General Social Survey noted what workers think about public transit: A major goal of urban transportation is to encourage car users to leave the comfort and convenience of their automobiles and take public transit. In Canada in 2010, 82% of workers travelled to work by car, 12% took public transit, and 6% walked or bicycled.

In the 2010 General Social Survey, workers who did not use public transit were asked if they had ever tried using public transit to travel to work. They were also asked how they rated the <u>level of convenience of public transit</u>. Of the 10.6 million workers who commuted by car, 15%, or 1.6 million, had tried using public transit to get to work. Slightly less than half (47%) of those who had tried public transit felt that it was a convenient way to get to work. The same question was asked of the nine million car users who had never tried using public transit to commute to work. Of that group, 15% thought that it would be convenient. In summary, of the 10.6 million car users, just over two million felt that public transit would be convenient for them, while about 8.3 million thought it would be somewhat or very inconvenient (Turcotte, 2010, p. 33).

• The following studies made no reference to factors stimulating a switch to an alternative for public mobility: Article on Rural Commuters Ottawa (General) (Carroll, 2019); the Fraser 2012 study on youth, the 2016 youth study in Lanark County (Lu, 2016), nor the main report from Lanark by Rogers and Leitch (2016), nor the Huron County Disadvantaged report (Marr, 2015).



## **Case Studies of Rural Transportation Initiatives:**

Among the case studies reviewed there was no discussion of what prompts behaviour change (moving from a private vehicle to some form of 'public transit', although it is likely there would be some anecdotal learning from actual operational experience:

- Colltrans Collingwood- Wasaga Beach and Collingwood Blue Mountains Transit Links
- Community Care Northumberland
- The Corridor 11 Bus
- Deseronto Transit
- Ride Norfolk
- Haliburton Rideshare (Rogers and Leitch, 2016, p. 22). (Service discontinued).
- City of Kawartha Lakes Rural Transit Pilot Project (Dial-a-Ride)
- Temiskaming Shores
- RideJAUNT.

"A considerable number of studies have used descriptive analyses and summary statistics to understand (transit) ridership changes and the factors underlying such changes... However, these studies are usually criticized for the weakness of their descriptive approaches which can be highly subjective and inconclusive due to the lacking measures of statistical significance of individual factors. Other studies used data from customer stratification and travel behavioural surveys, and they estimated econometric models to gain a better understanding of the attitudes, behaviour and perception of travellers, and the factors that could increase their willingness to use public transit.... The main advantage of these studies is their ability to provide empirical evidence on the decision-making process of travellers and their propensity to switch modes or discontinue some trips. However, these studies have normally examined disaggregate travel behaviour at a single time step, as opposed to changes over time. Longitudinal analysis of disaggregate travel behaviour has been rare because temporal data at the disaggregate level are very hard and expensive to obtain. As a result, some researchers argue that aggregate analyses provide a feasible and adequate alternative to understand the determinants of transit ridership... "



Table	4-1:	Transit	ridershi	p factors
rabic	4-11	11 an ou	nucram	p ractors

A. en fac	Built vironment ctors	B.	Socioeconomic factors	C. sei	Transit rvice factors	D. (e:	Other factors xternal/contextual)
1.	Population /	1.	Age	1.	Service	1.	Weather
	Population	2.	Gender		frequency		(temperature,
	density	3.	Student population	2.	Service		snow on ground
2.	Urban land	4.	Senior population		reliability		and precipitation)
	area	5.	Workforce		(e.g., headway	2.	virtual
3.	Land use mix	б.	Unemployment rate		adherence, on-		connectivity
4.	Green space	7.	Household size		time		(telecommuting,
5.	Local	8.	Car ownership rates		performance)		online shopping)
	opportunities:	9.	Ownership of driver's	3.	Service	3.	Air quality (Air
	businesses		license		network		Quality Index and
б.	Local	10.	Household composition		coverage		Air Quality
	opportunities:		(e.g. couples with (out)	4.	Network		Health Index)
	recreation		children, singles, etc.)		design/type	4.	Price of car
7.	Freeway	11.	Household disposable	5.	Service		ownership
	network length		income		span/hours		(fuel/energy,
	and exits	12.	Household's	б.	Vehicle		insurance,
8.	Highway		expenditure on		revenue hours		maintenance)
	network length		transport	7.	Vehicle	5.	Congestion
	and exits	13.	Average rent/shelter		revenue miles		(average
9.	Street network		cost	8.	Fare		level/cost)
	length and			9.	Fare/income		

Canadian Transit Ridership Trends Study Page 14 - CUTA Final report /10.2018

Figure 4 - Canadian Transit Ridership Trends Study, CUTA Final Report, October 2018, p. 8, (Miller, Shalaby, Diab, and Kasraian) Chart continued on following page



A. Built environment factors	B. Socioeconomic factors	C. Transit service factors	D. Other factors (external/contextual)
factors number of intersections 10. Railway lines and stations 11. Private dwellings by type (e.g. single- detached, apartment) 12. Dwelling characteristics (e.g., period of construction, condition) 13. Dwelling tenure 14. Property value	<ol> <li>14. Employment status and type (part-time/full time)</li> <li>15. Employment sector (e.g. agriculture, utilities, construction)</li> <li>16. Employment/population ratio</li> <li>17. Education (highest certificate)</li> <li>18. Immigration status (citizen or not)</li> <li>19. Immigration period</li> </ol>	<ol> <li>Availability of integrated-fare payment systems</li> <li>Composition of fleet and modes (bus, subway or LRT)</li> <li>Density of dedicated bus lanes and transit preferential treatment</li> <li>Availability of real-time information</li> </ol>	<ol> <li>Active transportation support systems (availability and promotion, bike- sharing scheme)</li> <li>Vehicles for hire/ride-sharing availability (Uber, Lyft, Taxis)</li> </ol>
<ol> <li>Work location (in/outside census subdivision of residence)</li> <li>Distance to downtown</li> </ol>		<ol> <li>Transit service accessibility</li> <li>Average network load</li> <li>Transit funding</li> </ol>	
17. Employment in downtown		User satisfaction level	

Figure 5 – Source: Canadian Transit Ridership Trends Study, CUTA Final Report, October 2018, p. 8, (Miller, Shalaby, Diab, and Kasraian)

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# **10.** What Types of Transportation Services Are Mentioned in the Literature? Which Types are Common? Which Are Rare or Unique?

Among the literature reviewed, the most common types of services offered were buses, vans and private vehicles with fixed route/corridor or door-to-door service. Interestingly, there is no discussion about dedicated services (those that transport groups of individuals to a particular workplace).

### **Case Studies of Rural Transportation Initiatives:**

- ✓ Colltrans Collingwood- Wasaga Beach and Collingwood Blue Mountains Transit Links: 2 buses (one for each link).
- ✓ **Community Care Northumberland**: vans (6).
- The Corridor 11 Bus: corridor/ fixed route- bus operated by Hammond Transportation (outside contract).
- Deseronto Transit: two community buses, both accommodating wheelchairs, and two minivans provide public transportation- fixed route. Operated by a Transit Commissioner from the Town of Deseronto.
- Ride Norfolk: bus service operated by the Community services department of Norfolk County and overseen by the Ride Norfolk transportation Committee (RNtC). The bus service is contracted out by a private carrier.
- Haliburton Rideshare: rideshare in a private vehicle (Rogers and Leitch, 2016, p. 22).
   (Service discontinued).
- ✓ City of Kawartha Lakes Rural Transit Pilot Project: car transit service- door-to-door.
- ✓ **Temiskaming Shores**: bus
- RideJAUNT: 85 vehicle fleet including buses- offers a fixed commuter service as well as pick up (door-to-door) service (see <u>www.ridejaunt.org</u>).
- Canadian Ridership (Miller, Shalaby, Diab, and Kasraian, 2018). This report included a review of only those transportation services that were fixed-route and excluded any that were flex transit systems, on-demand services, or specialized bus services (e.g. school services).



### **Studies on People Accessing Transportation Services:**

#### **Existing Services:**

Lanark County (Youth): Lu (2012) conducted "Secondary Research" in a study of Youth and Transportation in Lanark County. The author notes that the few cases which offered a strategy to rural transportation varied in terms of their approach. Many contracted with local busses from urban centres, while others utilized charter busses or constructed a ride-sharing/ carpooling alternative. Many of the carpooling services offered are operated by volunteers within the community, while others are operated through a call-per-use approach similar to a taxi (Lu, 2016, 11; see "Secondary Research").

Many individuals, particularly those residing in the northeastern areas of the County, commute to Ottawa for employment purposes. There are also several bus services that provide daily commuter service to Ottawa. Route and schedule information are offered through OC Transpo "Rural Partner Services". Greyhound Canada and VIA Rail also provide transit services but only for out-of-County excursions to Ottawa and Kingston. Some of the other common modes of transportation in and around Lanark County are carpooling, car or truck rentals and taxi services (Lu, 2016, p. 6).

There are some alternatives services provided by Lanark Transportation Association which offers services to local residents in need of assisted transportation, as well as volunteer-based transportation services through organizations such as Community Home Support and the Cancer Society (Lu, 2016, p.6).

### Commonly used types of services for Youth/Lanark County:

For people presently living in Lanark County: Based on the various activities performed by residents in Lanark County (i.e., attend post-secondary education, travel to work, recreational, leisure and after school activities), the dominating methods of transportation used to arrive at one's destination were consistent throughout all activities:

- Driving oneself using a car or motorcycle
- Someone else drove / Carpooled
- Walked.

For the most part, a large percentage of individuals drove to and from their destination by themselves or through the mean of carpooling; a fair number of individuals walked to



and from their destinations. When reviewing transportation for travelling to educational institutes, the primary method was driving followed by walking (Lu, 2016, 16).

Lanark County (General Public): As far as method of commuting goes, since much of the commuting is rural to rural, and the area is not well served by public transit or equivalent options, by far the most common method is in a car, truck or van, driving alone. About 90% of Lanark County commuters travel by car, truck or van, and about 82% are typically alone in the vehicle. The number of Lanark County area residents using active transportation (walking, cycling) is small –about 7% -it is not much different from the Ottawa-Gatineau region with about 8.5% in that group. In the National Household Survey 2011, about 600 Lanark County residents said they used public transit to get to work, although no such system officially exists within the county. These respondents may include people who drive or carpool to the nearest OC Transpo stop, as well as those who consider the commercial commuter bus services from Perth, Carleton Place and Mississippi Mills to be the equivalent of public transit. Whatever the case, the proportion of the workforce using some form of bus or transit system is very small –about four per cent (Rogers and Leitch 2016).

Taxi-bus Services: The City of Clarence-Rockland commissioned a transit feasibility study in 2014 http://www.clarence-rockland.com/images/crtreport.pdf. This study included a brief overview of several potentially relevant rural transit systems and options. The concept of a taxi-bus system was considered to be particularly worthy of consideration for sparsely populated rural areas. The Clarence-Rockland study included descriptions of taxi-bus systems in Rimouski, Thetford Mines, and Salaberry-de-Valleyfield in Quebec, as well as South West Nova Scotia and Peace River, Alberta. While there are many local variations, taxi-bus services are generally vans or mini-buses (although sometimes are regular taxis) with approximate routes and schedules that vary according to confirmed bookings. Typically, riders need to be registered with the system and book rides at least an hour in advance. The system uses scheduling software to develop the final route and schedule. In several places the taxi-bus system is used as a feeder for transit systems to provide residents in remote areas with access to transit. In most cases the fare is somewhat more than a public transit ride but less than a commercial taxi, and the cost of operating the system is subsidized by the municipality and/or the province (Rogers and Leitch, 2016).

Huron County (Disadvantaged Groups) (Marr, 2015)



**Ottawa**- Although Fraser (2012) looks through a lens of "preventing crime and promoting safety among Ottawa's rural youth" in his transportation assessment of Ottawa, Fraser creates an index of what currently exists for rural residents in terms of transportation options and examples of innovative initiatives. Affordable Car Ownership Programs While public transit and other transportation services may be available, these services do not work for everyone and many individuals prefer travelling in a vehicle for a variety of reasons. Studies have found that owning a car leads to increased earnings and reduced reliance on state social programs (Hayden & Mauldin, 2002). To address this specific need, non-profit organizations and government agencies throughout the United States have coordinated to make affordable cars available to low income families and job seekers. In one study of American car ownership programs, it was found that these programs made cars with a retail value from \$2,000 to \$5,000 available at a cost ranging from \$0 to \$5,000 depending on the client's financial situation. Car ownership arrangements are usually structured through monthly loan or lease payments (Fraser, 2012, p. 9).

Affordable car ownership programs seem to be more prevalent in the United States than in Canada. In Canada, a number of communities operate co-operative car share programs that allow members to reserve a car as needed and pay an hourly and/or distance rate on top of a yearly membership fee (e.g., VRTUCAR in Ottawa). Some of these programs offer free memberships to qualified clients. For example, Victoria Car Share in British Columbia partners with the Greater Victoria Housing Society to offer free memberships to residents of public housing. However, most car share programs seem to be located in urban, and not rural, areas. Other types of programs include ride sharing where online services match drivers and passengers (e.g., Ottawacarpool.ca, Carpool.ca, and eRideshare.com) (Fraser, 2012, p. 10).

Canadian Ridership General (Miller et al., 2018).

Rural Commuters Ottawa (General) (Carroll, 2019).

N/A Transit Ridership Canada (General) (Curry, 2017)

**Telecommuting:** This paper presents an overview of the current literature on telecommuting. We estimate the telecommuter surplus in Southwestern Ontario where the region is currently deploying one of Canada's largest publicly-funded ultra-high-speed broadband initiatives known as South West Integrated Fibre Technology Inc. (SWIFT). The analysis is based on SWIFT residential and farm surveys (n = 3948) conducted in 2017. We find that an average telecommuter's surplus in terms of costs saved, including opportunity cost ranges from \$8820 to \$23964 per annum per telecommuter, depending



# on the number of days tele-commuted per week for home and primary residence dwelling type. <u>Private net benefit</u> is the focus of this paper (Hambly and Lee, 2019- Abstract).

Advantages and disadvantages of telecommuting identified in the literature.

Sources: Arnold, 2006; Duxbury et al., 1998; Fuhr & Pociask, 2011; Gajendran & Harrison, 2007; Hinds & Kiesler, 2002; Koenig, Henderson, & Mokhtarian, 1996; Niles, 1998; Picu & Dinu, 2016; Scholefield & Peel, 2009; Zukowski, 2015.

	Employers	Employees (telecommuters)	Society/Government
Advantages	<ul> <li>Recruitment and retention</li> <li>Reduced absenteeism</li> <li>Increased productivity</li> <li>Cost savings from reduced office space</li> <li>Cost savings from lower utilities expense</li> <li>Office decentralization</li> <li>Reduce the cost of complying with disabilities, environmental and office safety regulations</li> <li>Better/positive company image</li> <li>Expand the talent pool beyond geographic boundaries</li> </ul>	<ul> <li>Savings in costs by not commuting</li> <li>Flexibility in hours and improved work/life balance</li> <li>Increased job satisfaction</li> <li>Greater ability to participate in the workforce</li> <li>Flexibility of housing location</li> <li>Overcome lack of public transportation barriers</li> <li>More effective time management</li> </ul>	<ul> <li>Reduced traffic congestion and infrastructure demand</li> <li>Reduced probability of fatal road accidents</li> <li>Potential reduction in rural-urban wage gap</li> <li>Savings on oil (non-renewable energy)</li> <li>Raise the standard of living in rural and disadvantaged areas</li> </ul>
Disadvantages	<ul> <li>Imperfect substitute for workplace face-to- face interaction</li> <li>Workplace culture issues and trust</li> <li>Communication and management costs</li> <li>Confidentiality and security concerns</li> <li>Not every job can be telecommuted</li> <li>Technical feasibility/costs</li> </ul>	<ul> <li>Worker isolation</li> <li>Exclusion from workplace decisions</li> <li>Inhibited career progression</li> <li>Lack of technical assistance</li> <li>'Role blurring' between work and personal life</li> <li>Precarity in home-shoring or outsourcing of jobs</li> <li>Lack of monitoring of employees</li> </ul>	<ul> <li>Limited evidence on the overall cost-benefit of telecommuting</li> <li>Travel demand management (TDM) transportation planning does not coincide with broadband investment planning</li> </ul>



## APPENDICES



### **Appendix A: Sources**

Note: (R/U/R) refers to Rural/ Urban/ Regional

## Note to Readers: How will COVID-19 Affect Transit Ridership and the Literature Review Findings?

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# Appendix B:

# **Excerpts from Publications That May Be Useful for Later Stages of the Project**

*Highlights of Self-contained Labour Areas: A Proposed Delineation and Classification by Degree of Rurality*; Anne Munro, Alessandro Alasia and Ray D. Bollman, Statistics Canada; Rural and Small Town Canada Analysis Bulletin (December 2011)

- The authors delineated 349 'self-contained labour areas' (SLAs) based on commuting flows, in which 'self-contained' means most of the residents with jobs are working in the area and most of the jobs in the area are filled by workers residing in the area.
- Between 197 and 229 self-contained labour areas can be described as 'rural', depending on how 'rural' is defined.
- Between 29 and 39% of rural Canadians reside in a rural self-contained labour area. However, the majority of rural residents reside and work in a labour market with some degree of connection to a larger urban centre.
- Many census subdivisions were too small to provide reliable estimates of 'commuting rates' or had no commuting flows; these CSDs were not assigned to a self-contained labour area. Additional criteria (e.g. road networks, geographic proximity etc.) could be used to create custom areas.
- A recent study has shown that, for residents of areas outside a CMA or CA, the commuting exchange with other non-CMA/CA areas is as significant as the commuting toward larger urban centres (Harris, Alasia and Bollman, 2008) In other words, for Canadian residents of rural and small town (RST) areas, the labour markets represented by small towns and rural settlements area as important as the labour markets of larger urban centres.
- The data used to create the SLAs are based on commuting flows (journey to work) generated from the 2006 Census of Population. Analysis was conducted at the geographic scale of Census Sub-Divisions. At the time of this analysis, there were 5,418 CSDs in Canada; for 1,256 of them there were no commuting flows. There were 128,164 inhabitants living in these CSDs at the time of the analysis.
- There were 336 CSDs that showed no in-commuting and no out-commuting but there was commuting within the CSD. Some of these CSDs were quite remote or very small. The remaining 3,826 CSDs were grouped into 349 self-contained labour market areas. The minimum level of self-containment for these SLAs was 75%, with the average being 96%.
- In some cases, there were no workers living in a CSD but workers were commuting into it (e.g. there may have been a single/several large employers there but no residential population).



# **Box 3: Methodology**

The delineation of self-contained labour areas (SLAs) was based on a clustering procedure using data on the reciprocal flows of commuters. The method is derived from the algorithm developed by Bond and Coombes (2007) and the implementation of the algorithm was done in the SAS programming language. The main features of the method are outlined below while the details are presented in a forthcoming technical paper (Munro et al., forthcoming).

# Clustering algorithm: focus on reciprocal importance of commuting flows

The algorithm used in this analysis has specific features that make it useful for the purpose of discovering rural labour areas. We used an algorithm based on the principle of "reciprocal importance" to indicate the strength of the linkage between any two census subdivisions (CSDs). The algorithm at the core of the clustering procedure shows a stronger linkage between two areas if the flows between any two areas are proportionally important to both areas. Specifically, our measure of reciprocal importance (RI) is:

$$RI_{a,b} = RI_{b,a} = \frac{F_{a,b}}{R_a} * \frac{F_{a,b}}{W_b} + \frac{F_{b,a}}{R_b} * \frac{F_{b,a}}{W_a}$$

where F is the flow of workers (number) who commute from one CSD to another (a to b, or b to a); R is the number of workers who reside in the CSD (a or b), regardless of where they work; W is the number of workers who work in the CSD, regardless of where they live; and a and b are the subscripts for any pair of CSDs.



#### Rural and Small Town Canada Analysis Bulletin, Vol. 8 No. 8

Map 4. Self-contained labour areas (SLA), Southern Ontario, 2006

Map 5. Census subdivisions classified by metropolitan influenced zones, Southern Ontario, 2006



Source: Delineated by authors using commuting data from the 2006 Census of Population, Statistics Canada Map produced by Remote Sensing and Geospatial Analysis, Agriculture Division, Statistics Canada

Conclusion: The driving idea that underpins this analysis is the evidence that rural-to-rural commuting is a key feature of some rural areas.... The delineation of SLAs presented in this analysis is less urban-centric and more sensitive to the multi-directional nature of commuting flows, compared to the MIZ (Metropolitan Influence Zone) classification which is based on the degree of influence of LUCs (Large Urban Centres).... It is suggested that our pattern of SLAs will be useful for analysts to combine with their own data to build 'functional areas' suitable for their specific purposes. Examples include road network patterns and the provision of health services.



Rural and Small Town Canada Analysis Bulletin, Vol. 8, No. 8

Map 8. Self-contained labour areas with an overlay of the of the 2006 highway network, Southern Ontario, 2006



Source: Delineated by authors using commuting data from the 2006 Census of Population, Statistics Canada Map produced by Remote Sensing and Geospatial Analysis, Agriculture Division, Statistics Canada



*Excerpts from Burkhardt, J.E., Nelson, C.A., Murray, G., and D. Koffman. (2004).* TCRP Report 101. *Toolkit for Rural Community Coordinated Transportation Services*. Retrieved from <a href="http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp">http://onlinepubs/tcrp/tcrp</a> rpt 101.pdf

**System Characteristics that May Be Useful for Financial Modelling and Operational Evaluation:** The Toolkit suggested the following system characteristics that coordinated transportation services might influence positively. Any number of these characteristics might be chosen as

evaluation criteria (did the service achieve the 'desired or expected change' or benefit. As a result, these criteria could be incorporated into transportation service route planning and ultimately, the financial sustainability of the entire initiative.

**Evaluation Criteria for Transportation Services:** Table 3 (at right) contains performance measures that may be useful for assessing the sustainability of transportation service models developed in the 'Commuter Strategy' Project. These would be important to a potential operator, funders or partners in service delivery.

Table 4 (also on p. 27) from the same publication suggests five service attributes/criteria that might be considered in assessing transportation service models

- Acceptability
- Accessibility
- Adaptability
- Affordability
- Availability.

Table 2: POTENTIAL COORDINATED TRANSPORTATION BENEFITS: SYSTEM CHARACTERISTICS (INPUTS)

Factor	Desired or Expected Chang
System Characteristics (Inputs)	
Number of transportation providers	Lower
Number of agencies purchasing transportation	Higher
Number of vehicles	Lower
Number of drivers	Lower
Part-time/full-time driver ratio	Lower
Average hourly driver wage	Higher
Total driver wages	Lower
Level and quality of driver training	Higher
Hours when service is provided each day	Expanded
Days when service is provided each week	Expanded
Vehicle hours of service	May be lower
Vehicle miles of service	May be lower
Total service area	Expanded
Number of persons who can get services	Expanded
Joint purchasing	More frequent
Joint dispatching of agency-owned vehicles	More frequent
Centralized oversight and management	More frequent
Level of route duplication	Lower
Number of funding sources	Higher
Total transportation funding	Higher
One central community information source	More frequent
Segregated client types	Less frequent
Limited trip purposes	Less frequent
Community-wide transportation perspective	More frequent
Time spent in meetings	Higher
Level of planning processes	Higher

Table 3 – Source: TCRP Toolkit, p. 26



**Transportation Service User Evaluation Criteria**: Table 5 (p. 28) describes measure that transportation system *users* might consider important in evaluating community responses to transportation needs (overall service assessments). Presumably these would also be important

to the system/service operators as well as intermediaries participating in collaborative initiatives:

- The availability of alternative travel options (i.e. "choices")
- Ratings for transportation services, which could include outcomes such as:
  - Independence
  - Security
  - Mobility
  - Isolation (overcoming)

Development of Potential Solutions (Models) to Be Introduced/Tested: P. 57

#### Table 3: POTENTIAL COORDINATED TRANSPORTATION BENEFITS: PERFORMANCE MEASURES

Factor	Desired or Expected Change
Performance Measures	
Number of passenger trips	Higher
Number of passenger trips per service area population	Higher
Passenger trips per vehicle mile	Higher
Passenger trips per vehicle hour	Higher
Number of driver hours per passenger trip	Lower
Number of admin staff hours per passenger trip	Lower
Cost per vehicle hour	Lower
Cost per vehicle mile	Lower
Cost per passenger trip	Lower
Community benefits:	
Economic activity	Higher
Economic growth	Higher
Nursing home admissions per 1,000 population	Lower

 Table 4 - Burkhardt, J.E., Nelson, C.A., Murray, G., and D. Koffman. (2004). TCRP Report 101.

 Toolkit for Rural Community Coordinated Transportation Services. Retrieved from

 <a href="http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp">http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp</a> rpt 101.pdf

has a list of content for any potential course of action/model

# Service Development Options:

P. 60 covers service development, delivery and pricing options (see following tables).



### Service Development, Delivery, and Pricing Options

Service development options are driven by a number of factors: the size, land development character, and population density of the area within which service will be provided; the inclusion or exclusion of services available to the general public; special needs of customers such as disability status; the particular needs of participating agencies and access to programs and centers that provide client services; the days and times of day that their clients require transportation; and the stability or instability in client travel needs from day to day and week to week.

Specific service delivery options could include traditional fixed route; door-to-door (also known as paratransit or demand responsive); flexible routing; paid or volunteer drivers; shared riding; and voucher or userside subsidies, among others. In most rural counties, the delivery of service in areas where customers are far apart is a significant challenge particularly because the length of travel to reach destinations is long. Consequently, travel ties up vehicle capacity for a long period of time, and the cost per passenger can be very high. A flexible coordinated travel service could mitigate these high costs.

Service delivery may occur through a single agency where all services are onsolidated or through a decentralized, but centrally managed, environment with a number of service providers.

The role of technology service development and delivery is important. In a coordinated setting, an appropriate investment in technology can help with a number of tasks that are important to making coordination work effectively:

- Scheduling passenger trips;
- Handling rides that occur on a regular basis;
- Integrating recurring rides with rides that vary daily and those that occur infrequently;
- Assigning passenger trips to the transportation vehicles available within the coordinated system;
- Tracking rides and service use across multiple agencies with different eligibility, billing, and reporting requirements; and
- Tracking activity and performance for monitoring and reporting purposes, both within the coordinated transportation system and within the community at large.

Service delivery may occur through a single agency where all services are consolidated or through a decentralized, but centrally managed,



Excerpts from Rural Public Transportation Strategies for Responding to the Livable and Sustainable Communities Initiative, Chisholm Smith, G. (2012). Research Results Digest, 375. Washington, DC: Transportation Research Board. Retrieved from https://www.nap.edu/read/22761/chapter/1 Copyright National Academy of Sciences, all rights reserved

# Checklist for Developing a Rural Regional Route:

### Step 1: Identify Needs

### □ Identify sources of information

- □ Statewide studies
- □ Local coordination plans
- □ Local transit development plans
- □ Regional planning organizations
- □ External events (plant closing, loss of intercity bus service, parking issues)

#### Define needs

- Demographic analysis
- □ Specific populations needing service --- numbers of person/trips
- □ Trip characteristics --- schedule requirements, seasonality, weekday/weekend
- □ Special needs --- accessibility, key destinations, maximum ride time

### Step 2: Establish Planning Leadership

### □ Identify potential sources of support

- □ Local coordination committees
- □ Metropolitan and rural regional planning organizations
- □ Local transit providers
- □ Local planning staff
- Business community
- Elected officials
- □ Identify lead agency --- define roles
- □ Identify lead individuals/team
- **Create regional steering committee** 
  - Define role
  - □ Set expectations



## Step 3: Goals and Vision --- Public and Stakeholder Input

- □ Community input
  - Online surveys
  - □ Public meetings and workshops
  - □ Presentations at other community meetings
  - □ Pop-up surveys at transportation hubs or community meetings

#### □ Interview stakeholders

- □ Human service organizations
- □ Health-medical community
- □ College and university staff
- □ Employers/business community
- □ Local governments --- planning, economic development, public works staff
- Elected officials

#### Surveys

- □ General public
- □ Existing transit users
- □ Carpool and vanpool riders
- Park and ride lot users
- □ Employees of specific destinations
- Seniors
- □ Students --- community college, college and university

#### **Step 4: Identify Resources**

- □ Inventory existing services
  - Transit
  - □ Ridesharing carpool and vanpool
  - □ Intercity bus
  - Passenger rail
- □ Identify potential funding and partners
  - □ Federal transit funding programs
    - Section 5311 rural
    - Section 5311 (f) intercity
  - Potential for use of Section 5311 (f) in-kind (based on schedules, potential connectivity)
     --- intercity bus companies
  - □ State transit funding programs
    - Special incentives for regional organizations/services
    - Potential for innovative funding sources
  - □ Local match sources



- □ Local governments
- □ Sponsorships---businesses, community institutions, foundations

#### **Step 5: Develop Alternatives**

- **Estimate ridership---develop range for each target submarket** 
  - □ Work trips
  - □ Human service trips
  - □ Intercity connections
  - Personal business and shopping
  - □ Social and recreational
  - □ School, community college, college and university trips
- **Develop potential routes and schedules---alternatives** 
  - □ Weekday mornings and evening for work trips
  - Dialysis
  - □ Other medical trip needs (including Medicaid non-emergency transportation)
  - □ Evening work/school trip requirements
  - Weekend needs
    - Work trips
    - Dialysis trips
- Identify key stops
- **Estimate required hours and miles of service**
- **Estimate size and number of vehicles required**
- **Determine infrastructure needs** 
  - Park and ride lots
  - Maintenance facilities
  - Secure storage
  - Fares and information technology
- □ Propose likely fare levels

#### Step 6: Assess Feasibility

- **Estimate revenue based on fare structure**
- **Estimate operating costs based on each service alternative option**
- **Determine net operating deficit for each service alternative option**
- □ Identify capital costs for each service alternative option
  - Vehicles
  - □ Infrastructure
- □ Identify potential organizational requirements
  - Policy body



- □ Need for multi-jurisdictional or multi-agency roles
- Grant application requirements (private non-profit or public agency?)
- □ Operator--- existing transit, contractor, new entity.

## □ Compare costs to potential funding sources

- Identify most likely
- □ Estimate how feasible

### Step 7: Prioritize---Recommended Plan

- **Present alternatives and feasibility assessment to leadership**
- □ Refine options, present to stakeholders
- **Refine based on input, present to policy-makers**
- Present to public--- refine.

### Step 8: Detailed Service Plan

- Develop final routes, locations, timetable
- Develop fare structure and level
- **Develop procedures to maximize connectivity** 
  - □ Transfers
  - □ Shared stops
  - □ Information
- **Regulatory and insurance requirements**
- □ Fleet needs
- □ Infrastructure
  - Operating facility
  - □ Secure vehicle storage
  - □ Stop locations, signs, shelters

## Step 9: Detailed Organizational Plan

- □ Lead agency/existing/new
- □ Legal authority/policy body---develop intergovernmental agreements
- □ Staffing
  - Roles
  - □ Employer
- □ Contracting---management, operations, maintenance, cleaning?
- □ Human resources functions
- Technology
  - □ Fare collection



- Passenger information
- Data collection
- **Federal and state compliance responsibility**
- □ Marketing/public relations

### **Step 10: Implementation Plan and Action Items**

- Identify tasks
  - □ Institutional arrangements (MOUs, contracts)
  - Vehicle procurement
  - □ Office space
  - Operations facility
  - □ Infrastructure arrangements
  - □ Contracting or hiring staff, administrative and operating
  - □ Branding and marketing
- □ Assign responsibilities
- □ Identify timeframes and interdependencies---phasing if appropriate

#### Step 11: Initiate Service

- Branding
- □ Marketing campaign
- □ Initiate operations

#### Step 12: Evaluate and Fine-Tune---Iterative Process



Excerpt from TransitPlus Inc. (Colorado State Study), on modes of transportation to work; note two sections of to the table

			Total Workers	Drove alone	2- person Carpool	3-or- more person Carpool	Public Transportation	Bike	Walked	Taxi, Motorcycle. and Other	Worked at Home
Denver	Residents	Number	295,432	204,843	23,645	6,122	22,968	5,472	12,365	4,015	16,002
		Percent	100.0	69.3	8.0	2.1	7.8	1.9	4.2	1.4	5.4
	Workers	Number	451,562	325,369	36,869	8,655	41,003	5,616	12,359	5,689	16,002
		Percent	100.0	72.1	8.2	1.9	9.1	1.2	2.7	1.3	3.5
Adams	Residents	Number	204,553	155,965	21,099	5,614	8,735	736	3,065	2,453	6,886
		Percent	100.0	76.2	10.3	2.7	4.3	0.4	1.5	1.2	3.4
	Workers	Number	157,037	123,315	14,083	3,543	3,471	793	3,070	1,876	6,886
		Percent	100.0	78.5	9.0	2.3	2.2	0.5	2.0	1.2	4.4
Arapahoe	Residents	Number	281,253	219,450	20,739	4,935	12,336	1,255	4,897	2,999	14,642
		Percent	100.0	78.0	7.4	1.8	4.4	0.4	1.7	1.1	5.2
	Workers	Number	269,772	217,198	19,596	3,743	6,729	1,193	4,567	2,104	14,642
		Percent	100.0	80.5	7.3	1.4	2.5	0.4	1.7	0.8	5.4
Boulder	Residents	Number	150,237	99,407	10,557	2,647	8,022	6,183	6,703	1,862	14,856
		Percent	100.0	66.2	7.0	1.8	5.3	4.1	4.5	1.2	9.9
	Workers	Number	176,783	123,463	13,449	3,047	7,336	6,197	6,622	1,813	14,856
		Percent	100.0	69.8	7.6	1.7	4.1	3.5	3.7	1.0	8.4

#### Table 6: Mode of Transportation to Work

App C: Demand Estimation

C-15

TransitPlus, Inc.

		Number	293,332	226,775	22,225	6,019	3,766	1,146	13,572	3,344	16,485
El Paso	Residents	Percent	100.0	77.3	7.6	2.1	1.3	0.4	4.6	1.1	5.6
		Number	292,588	227,392	22,330	5,704	3,592	1,134	13,237	2,714	16,485
Larimer	WOIKEIS	Percent	100.0	77.7	7.6	1.9	1.2	0.4	4.5	0.9	5.6
		Number	148,674	112,454	11,267	3,011	1,157	5,583	3,639	1,892	9,671
	Residents	Percent	100.0	75.6	7.6	2.0	0.8	3.8	2.4	1.3	6.5
		Number	141,534	107,298	10,088	2,636	1,047	5,550	3,757	1,487	9,671
Weld	WORKERS	Percent	100.0	75.8	7.1	1.9	0.7	3.9	2.7	1.1	6.8
		Number	115,789	91,550	10,056	2,930	717	625	2,483	1,401	6,027
	Residents	Percent	100.0	79.1	8.7	2.5	0.6	0.5	2.1	1.2	5.2
	Workere	Number	91,856	70,473	8,171	2,529	529	620	2,439	1,068	6,027
	WOIKEIS	Percent	100.0	76.7	8.9	2.8	0.6	0.7	2.7	1.2	6.6

Source/Note US Census Bureau, ACS 2006-2008 3yr est., Special Tabs for CTPP



# Appendix C: Example of RFPs for Rural-Urban Transportation Services

# **Current Rural-Urban Pilot Projects (TRID):**

# Access to Jobs, Economic Opportunities, and Education in Rural Areas

Populations across the country are shifting, creating a need for stronger connections to rural areas. These connections might be rural-to-rural or rural-to-urban. Population shifts have created challenges for employers in rural areas and their ability to expand and recruit additional employees. Moreover, jobs in our urban areas are not paying adequately, and increasing access for populations in rural areas to jobs in rural communities is important to their success. Transit plays a necessary role in traditional and non-traditional models in helping to solve this employment shortage. The objective of this research is to identify specific needs in rural communities, including employment, education and transportation, and explore the range of new relationships and partnerships needed to improve access, not only to jobs and education, but also to other necessary community services. While many jobs, education institutions and medical facilities will be located in metropolitan regions, major employers supporting economic prosperity will also be located in suburban and rural areas. Commuting patterns will become increasingly regional, requiring transit agencies to develop new services to connect employees across jurisdictional boundaries. New local routes, regional commuter services and rural routes facilitating access to employment will support sustainability and growth to regional and statewide economies. This process represents a paradigm shift away from looking at jurisdictional–based planning, looking instead at larger geographic area needs or travel sheds to meet those needs.

#### **Record URL:**

#### http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4743

**Supplemental Notes:** Contract to a Performing Organization has not yet been awarded.

Status: Proposed Funding: \$250,000 Contract Numbers: Project 08-131 Sponsor Organizations: National Cooperative Highway Research Program Transportation Research Board 500 Fifth Street, NW Washington, DC United States 20001 American Association of State Highway and Transportation Officials (AASHTO) 444 North Capitol Street, NW Washington, DC United States 20001 Federal Highway Administration 1200 New Jersey Avenue, SE Washington, DC United States 20590

Project Managers: Goldstein, Lawrence Start Date: 2019/06/03 Expected Completion Date: 2019/06/03

Filing Info



Accession Number: 01707716 Record Type: Research project Source Agency: Transportation Research Board Contract Numbers: Project 08-131 Files: TRB, RiP Created Date: Jun 3 2019 3:17PM

# **Flexible Transit Services in Rural Areas**

Public transportation service in Massachusetts is operated by the MBTA and 15 Regional Transit Authorities (RTAs). Outside of the larger cities, the density of demand for transit is low, which makes the provision of service costly. The research problem is to identify if there are flexible transit services that could be operated more cost-effectively in rural and low-density communities than conventional fixed routes to increase ridership. Flexible transit can take many forms, ranging from a fully flexible paratransit system to a more structured service that allows flag stops or route deviations. This research will synthesize insights from the pilot programs that are now being started in order to develop guidelines for best practices based on the experiences of local agencies. This project has the following research objectives: (1) Develop a method for identifying potential markets for flexible transit service and the type of flexible service that would most cost-effectively serve the demand. This will require comparing the cost-effectiveness of operations for a range of potential levels of demand associated with rural and low-density communities. (2) Identify the data requirements and opportunities associated with General Transit Feed Specification (GTFS)-flex specification, particularly focusing on the requirements for implementing an automated reservation system for flexible services. (3) As data from pilot flexible transit pilot programs in Massachusetts become available, compare the theoretical analysis with the pilot program data and connect it with lessons learned in practice in order to develop guidelines and best practices for future implementations.

Status: Active Funding: \$165,000 Sponsor Organizations: Massachusetts Department of Transportation 10 Park Plaza Boston, MA United States 02116

Start Date: 2019/10/25 Expected Completion Date: 0 Geographic Terms: <u>Massachusetts</u> Subject Areas: Planning and Forecasting; Public Transportation;

Filing Info Accession Number: 01719619 Record Type: Research project Source Agency: Massachusetts Department of Transportation Files: RiP, STATEDOT Created Date: Oct 21 2019 4:20PM

