"Maintaining and Expanding Public Transit Ridership: Findings and Research Implications of an Ottawa Commuter Survey"

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Abstract

Studies conducted throughout the industrialized world have informed our understanding of the various built environment and transit service characteristics that influence commuters' ability and willingness to use public transit. However, little such research has been conducted in Canada, thus limiting our ability to ensure that efforts to promote public transit commuting in Canadian municipalities are properly suited to the potentially unique needs and demands of workers residing in those places. This paper compares the results of other public transit studies conducted elsewhere with the findings of a survey conducted in the City of Ottawa that examined attitudes toward public transit commuting from the perspectives of workers who currently travel by car and those who already use public transit. Although this small-sample survey was conducted as part of a larger study without the intention of drawing broad generalizations from the data collected, the results suggest several important directions for future research concerning the built environment and transit service characteristics that matter to Canadian commuters. The results also suggest that transportation researchers should consider using qualitative research methods more extensively when seeking to better understand this issue.

Background

As part of their efforts to create sustainable transportation systems, planners and policy-makers are increasingly seeking to enhance the transportation options available to their constituents. Transportation options can be defined as "the quantity and quality of transportation services available to an individual or group, taking into account their specific needs and abilities."[1] Whether a particular mode represents a

viable transportation option depends on the level of accessibility, or "the ease of reaching needed or desired activities",[2] provided by that mode. The enhancement of transportation options represents a considerable challenge in most Canadian cities because, throughout much of the past half-century, land use and transportation planning and investment have been devoted almost exclusively to accommodating one mode of travel, the automobile. Compact built environments that once allowed individuals to travel quickly and easily between trip origins and destinations have been replaced by sprawling patterns of development in which land uses are highly segregated[3], while, at the same time, the infrastructural and service needs of pedestrians, cyclists and public transit riders have largely been neglected in favour of addressing automobile users' mobility demands. These trends have had the dual impact of discouraging persons who have the option of traveling by automobile from using more sustainable modes and restricting physical access to necessary facilities and services for those who do not have the option of traveling by car.

The improvement of public transit accessibility to employment has become a common goal among communities seeking to provide their residents with greater transportation options. In pursuing this goal, however, it is imperative that planners and policy-makers fully understand what built environment and transit service characteristics influence commuters' ability and/or willingness to travel by public transit. Indeed, the extent to which workplaces are truly accessible by public transit is highly dependent on a number of factors. The spatial and temporal travel patterns of the metropolitan labour force have become increasingly diverse over the past several decades. It is for this reason that Banister and Gallent have argued that the successful promotion of "sustainable commuting" requires an understanding of contemporary journey-to-work patterns and their implications for the planning of built environments and transit services. The journey-to-work by public transit is much more complex than simply riding on a transit vehicle – for example, commuters must also travel to and from stops or stations, and may also need to stop at other destinations en route between home and work. Accordingly, determining the ideal conditions for public transit commuting is not an easy task.

Over the past several decades, studies conducted throughout the industrialized world have furthered our understanding of built environment and transit service characteristics that influence public transit accessibility, both in general terms and with specific regard for the journey-to-work. The problem for Canadian planners and policy-makers, however, is that only a few of these studies have been conducted in Canadian settings. Although it has been generally assumed that the causes of automobile dependence and the factors influencing transit ridership are similar from one country to another, the findings of other transportation studies suggest that this is a potentially dangerous assumption to make. For example, comparisons of North American and European countries have shown that levels of transit usage vary considerably from one place to another, despite the locations examined having similar social, economic and technological characteristics. This, therefore, suggests that more research related to public transit commuting should be conducted in Canadian locations before it is deemed appropriate to utilize research findings from other countries as the basis for efforts to promote public transit commuting in Canadian cities. Accordingly, this paper compares the results of a survey conducted in the City of Ottawa that explored attitudes toward public transit commuting from the perspectives of transit users and non-users with the findings of earlier studies conducted elsewhere. Although this small-sample survey was conducted as part of a larger study without the intention of drawing broad generalizations from the data collected, the results suggest several important directions for future research concerning the built environment and transit service characteristics that matter to Canadian commuters.

Methodology

In May 2001, a survey questionnaire was distributed to employees of a well-known auto and travel club at the organization's three offices, located in the eastern, western and southern suburbs of Ottawa. The survey questionnaire was distributed by means of the *drop-off/pick-up* method. In each case, contact was made with an office manager and arrangements were made to drop off the questionnaires on a weekday morning shortly after the office opened and to pick them up 24 hours later. The office managers distributed a questionnaire, along with an

explanatory cover letter and an informed consent form, to every employee working on the premises that day. On the questionnaire, respondents were asked to indicate their current mode of travel to work, their reasons for using this mode, their attitudes concerning the quality of pedestrian, bicycle and public transit infrastructure, facilities and services currently in place between their home and workplace and, finally, what improvements could be made to either encourage them to make the modal shift to public transit or to improve their experiences as public transit commuters. Sixty-nine survey questionnaires were completed, yielding an overall response rate of 43.4%.

Results

The characteristics of the survey respondents are presented in Table 1. Most of the workers with the organization surveyed are women, and this was reflected in the gender composition of the survey sample. About three-quarters of workers resided farther than five kilometres away from their workplace, meaning that public transit (rather than walking or cycling) represented the most viable alternative to the automobile for commuting purposes. Close to 80% of workers had access to a car for commuting purposes, but only 65% actually traveled to work by automobile.

In the survey, a vast majority of automobile commuters cited reasons related to the notion of “convenience”, as well as various time-cost advantages of traveling by automobile vis-à-vis public transit, in explaining their decisions not to use the latter mode (Table 2 and Box 1). In other cases, automobile use was often justified by a lack of transit service availability near the worker’s home or because the fixed costs of owning a car had already been paid.

Table 1
Characteristics of Survey Respondents (n=69)

Gender	**#**	**%**
Male	12	17.4
Female	57	82.6
Distance to Work		
Less than 5 km	18	26.1
5.0-9.9 km	8	11.6
10.0-14.9 km	14	20.3
15.0-19.9 km	11	15.9
>20.0 km	16	23.2
No answer	2	2.9
Days of Commuting		
Weekdays	43	62.3
Weekends	1	1.5
Weekdays and Weekends	25	36.2
Dependent Children		
Yes	32	46.4
No	36	52.2
Refused to answer	1	1.4
Transport Children During Commute		
Yes	17	53.1
No	15	46.9
Own or Have Access to a Car		
Yes	55	79.7
No	14	20.3
Mode of Travel to Work		
Car (Driver or Passenger)	45	65.2
Public Transit	12	17.4
Walk or Cycle	8	11.6
More than One Mode	4	5.8

Table 2
Reasons for Commuting by Car, Automobile Commuters

Reason	Total
Convenience	15
Lack of alternatives	10
Travel time relative to other options	12
Must pick up/drop off child at school/daycare	6
Would otherwise require too many buses/transferring	5
Because I own a car	3
Flexibility	3
Allows me to run errands at lunch time	2
Distance to work	2
Climate (too cold)	2
Need car for work purposes	2
In case of emergency with child (e.g. at school, home)	2
A co-worker drives me	1
Health reasons	1
Part of my lifestyle	1

The findings in this study mirror those of past research, which has shown that commuters' ability and willingness to use public transit is highly contingent on the spatial and temporal characteristics of the service provided. Spatial characteristics determine whether public transit travels *where it is needed* and, if so, *how direct the route between home and work will be.* Temporal characteristics determine whether public transit service is provided *when it is or may be needed* and, if so, *how often*. In the case of the survey conducted for this study, deficiencies related to the spatial and temporal characteristics of transit service were identified as being important reasons for workers' driving to work in lieu of using public transit. For example, a large proportion of workers surveyed in this study indicated that public transit service was not available where they lived and, therefore, that they could not use this mode even if they wanted to. This observation coincides well with a common finding in previous research, the frequent lack of public transit service *where it is needed*. This issue has become especially prominent in conjunction with the

increasing decentralization of metropolitan households and employment and the subsequent increase in levels of suburb-to-suburb, exurb-to-suburb, and other non-traditional (i.e., suburb-to-CBD) commuting.[4]

Studies have also shown that commuters, in deciding whether to travel by automobile or by public transit, consider the relative difference between the two modes in terms of travel time.[5] In this regard, investigations have frequently identified a lack of *direct* transit service between residential communities and employment areas as a disincentive to transit use, because the circuitous nature of many public transit routes or the requirement to transfer between routes can both add considerably to one's travel time.[6] A lack of direct transit routes was a common concern among automobile commuters surveyed in this study. Several respondents noted that they could, conceivably, commute by public transit, but that they would have to make at least one transfer between buses in order to do so. The difficulty of easily reaching the workplaces surveyed was illustrated by workers who did use public transit. In their cases, almost one-half had to transfer between buses, with 13.3% having to take three buses.

The *temporal* availability and frequency of service have also been identified as factors that influence workers' ability to commute by public transit. The increasing prominence of part-time employment and the expansion of business hours has resulted in the diversification of working times to a point where commuting has become a round-the-clock, seven-day-a-week phenomenon.[7] It has been within the context of expanded commuter travel times that researchers have frequently identified gaps between individuals' hours of work and transit agencies' hours of service provision.[8] Public transit schedules generally remain matched primarily to the needs of weekday, peak-hour commuters, while service tends to be less convenient at other times of the day and week, if it is even available at those times.[9] In the case of the workplaces surveyed in this study, many employees worked weekdays and weekends, and sometimes also travelled home in the late evening. For many, this posed further challenges to the use

of public transit due to the lower frequency of service provided during the evenings and weekends.

Researchers have also found that commuters are often looking for a high frequency of transit service before and after work, and also while they are *at* work,[10] and that poor public transit service frequencies strongly influence the decision to travel by automobile instead. Time spent waiting at transit stops is viewed as wasted time that could otherwise be used for more productive purposes, such as earning an income or attending to household responsibilities.[11] This is particularly true among women due to their more frequent need to balance paid employment with household and family responsibilities, such as escorting children to daycare and shopping for groceries. Commuters also require a high frequency of public transit service because this provides them with greater flexibility of travel times.[12] A notable obstacle to public transit usage has been the requirement to plan trips according to fixed route schedules, particularly when service is provided at very low frequencies – for example, only every 30 or every 60 minutes. In cases such as these, public transit commuters are often forced to arrive at work early and/or face excessively long waits for transit service after work due to inconvenient transit schedules.[13] The requirement for a high frequency of service throughout the workday stems primarily from employees' need for assurance that service will be readily available if they must leave work on short notice – for example, to pick up a sick child at school. In this survey, each of these issues was brought up on several occasions. For example, one public transit commuter noted that "[The] bus should come more frequently because with the present service, I either arrive at work 35 minutes early or 10 minutes late." Another worker, a parent, wrote: "I own a car and like to have a vehicle at work in case I have to leave due to an emergency at home."

Box 1
Reasons for Commuting by Car Related to Spatial and Temporal Characteristics of Public Transit Service, Survey Respondents

- "Easier, faster. No direct bus route, too many transfers."
- "It's faster to drive."
- "Too many buses involved to take the bus."
- "Convoluted bus connection: travel time would be approximately 1 hour instead of 15 minutes."
- "It takes too long, and I would have to take a couple of buses."
- "I would have to take a couple of buses."
- "Long duration on buses."
- "Takes too much time."
- "I don't think I would be able to do it in an acceptable time."
- "My convenience – I leave home when I work, I leave work when I'm done, No waiting for buses."
- "I have a busy schedule after work and would be late if I took the time […] to wait for a bus."
- "Inflexible, long public transit schedules."
- "One bus every half-hour is not convenient at lunchtime."
- "Inconvenient bus schedule. Long waits."
- "I would have to leave far too early to get to work."
- "I would not use public transit because it would not be worth it for me (time – locale – bus is only every ½ hour). I have to be home before 3 p.m. for my kids before they get home from school."
- "There is no way of getting home to my son in case of an emergency."
- "I own a car and like to have a vehicle at work in case I have to leave due to an emergency at home."
- "I prefer to have instant access to my own transportation."

It has also been widely demonstrated that public transit commuting can be facilitated by the provision of necessary goods and services within workers' home communities or near their workplaces.[14] Commute trips have grown in complexity over the past several decades as more workers engage in trip chaining by attending to personal and household business while travelling between home and work.[15] In 2000, for example, an American study found that the number of stops made by commuters on the way to work has increased by about 50% since 1980, while the number of stops in the homebound direction has grown by about 20%.[16] Researchers have also found trip chaining to be more common and more complex among female commuters, primarily due to their more frequent combining of household roles.[17] While men have been shown to be more likely to travel directly between home and work, one study demonstrated that about two in three women make stops on their way home and, furthermore, that about 25% of women make more than one stop.[18] When facilities and services required on a day-to-day basis are located within walking distance of workplaces, employees have the opportunity to visit these destinations before work, after work, or during coffee or meal breaks.[19] Furthermore, if commuters are able to accomplish tasks near their places of employment that would otherwise make up part of a more geographically-extensive trip chain, public transit becomes a more viable transportation choice due to the reduced need for travel to physically isolated activity sites.

Perhaps the most widely discussed type of facility required by commuters has been the daycare centre. As an abundance of research has shown, travel to daycare facilities is an integral component of contemporary commuting patterns. For example, a survey conducted by Neal et al. found that two-thirds of families with children under the age of eighteen used some form of out-of-home childcare arrangements[20], while Bianco and Lawson have argued that, for most working parents with young children, at least one of the adults in the household must take the children to daycare before work and pick them up after work.[21]

Trip chaining was also frequently cited in the Ottawa survey as a deterrent to transit use (Box 2). Of the 32 workers who noted they

had dependent children (46.4% of respondents), over one-half noted that they must transport their children to and from school or day care as part of their daily commute. Thus, the complications arising from not having direct routes to and from work were further exacerbated by the need to also stop at another destination.

Box 2
Trip Chaining-Related Reasons for Not Using Public Transit, Survey Respondents

- "Because I have to drop my daughter off at school first."
- "Convenience – day care pickup."
- "I have to drop off my daughter to school and pick her up after work, so it is definitely time consuming since she goes to school in another district."
- "Because I have to bring my son to the baby-sitter along the way."
- "I have to take my children to school and the baby-sitter's before work. It would take too long to take the bus."
- "I have a busy schedule after work and would be late if I took the time to walk or to wait for a bus."
- "I drive my son to school before work. It's faster to drive."
- "Because of time constraints, as I have 3 children to get ready besides myself."

The survey results also showed all respondents who were public transit commuters to be "captive riders", meaning that they did not have the option of driving to work. This was either because they did not have access to a household car, they could not afford to drive, or they did not possess a driver's license. The concerns about public transit commuting expressed by individuals in this group related more often to comfort- and customer service-related issues than to those associated with the spatial and temporal characteristics of the transit service they received. These included poor lighting at transit stops, a lack of comfortable waiting areas, and concerns about driver courtesy and crowding on buses. Among these is the need for shelter from the

elements, which is especially important in settings where public transit service frequencies are low and extreme weather conditions are commonly experienced.[22] This would ideally take the form of an enclosed and air-conditioned shelter (e.g. heated in cold climates, cooled in hot climates) so that rain, ice, snow, and extremely cold or hot temperatures do not discourage transit use.[23]

The availability of seating and storage space is an important concern in the decision to use public transit, for at least two reasons. First, when seating is unavailable due to overcrowded conditions this increases passengers' levels of discomfort, primarily due to a lack of personal space and privacy.[24] As one survey respondent wrote, "City needs more buses so that at peak periods you can get a seat and you do not have to stand up and be packed in like a can of sardines." Second, although public transit collisions are infrequent, the risk of being injured in an accident is higher for those standing than for those sitting. Transit agencies must ensure that an adequate level of service is provided on all routes so that enough seating is available for all passengers and overcrowding is therefore avoided.

The quality of customer service provided by drivers also has a strong influence on individuals' willingness to travel by public transit.[25] Unfriendly drivers can tarnish a transit user's perception of public transit quality by making their experience unpleasant.[26] The importance of customer service was well established in an analysis of complaints registered with a public transit agency in Gothenburg, Sweden, which found that most complaints related to how customers were treated by drivers, including the failure to stop where requested (either when waiting for a vehicle or when trying to leave the vehicle) and drivers not knowing the answers to their service-related questions.[27] Similar concerns were identified by public transit commuters in this survey. For example, one respondent wrote, "If they would just wait a few more seconds, especially when they see someone run toward the bus," while another said "get rid of bad and rude drivers."

Conclusion

The Ottawa survey data support much of the transit research which has been conducted in other parts of the world. As other researchers have noted, transit agencies will clearly play the most critical role in the promotion of public transit commuting. They have control over the spatial and temporal characteristics of public transit service, the quality of waiting environments, the physical attributes of transit vehicles, and the quality of customer service provided by drivers. At the same time, however, enhancement of public transit accessibility to employment can be further facilitated by other actors, including land use planners, private developers, and individual employers. Land use planners can assist in serving the needs of public transit commuters by advocating the adoption of planning policies that encourage mixed-use development in both residential and employment areas, require developers to build compact communities in which direct access to transit stops is provided, reduce building setbacks, and encourage the maintenance of aesthetically pleasing urban environments. The viability of public transit commuting both now and in the future will also depend on the willingness of developers to adopt transit-friendly designs in the construction of new communities, in the infilling of established communities, and in other construction projects, both large and small. Finally, employers can also assist in promoting public transit commuting by choosing to locate in areas well served by public transit and, if it is not possible to provide this as an in-house service, by locating in an area where daycare facilities are conveniently located for their workers.

The results of this study also point to several possible research avenues that can further assist in the promotion of public transit commuting within Canadian settings. First, the strong variation in accessibility-related concerns expressed by transit users and non-users suggests that both groups must be included in efforts to understand the breadth of commuters' public transit-related needs. Second, the increasingly important role of trip-chaining in the travel routines of contemporary commuters, especially among female workers, implies that more research is necessary that explores how such multi-tasking can be facilitated for public transit commuters.

Finally, the research findings suggest that a vast wealth of information can be procured through qualitative means of data collection, such as one-on-one interviews or focus group sessions. Commuting, whether by automobile or by public transit, has clearly become a much more complex process than it has been in the past. As a greater number of factors become important in the commuter's modal decision-making process, it would be wise to examine this topic in a more holistic way than simple quantitative techniques can allow.

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