

Employer Based Travel Demand Management - Devising Options to Meet Employee Travel Needs

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Employer Based Travel Demand Management - Devising Options to Meet Employee Travel Needs

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ABSTRACT

The Region of Waterloo is experiencing levels of growth in transportation demand that cannot be accommodated by existing transport infrastructure while maintaining adequate levels of service. In response, a travel demand management (TDM) program was initiated with the objective of reducing single occupant vehicle travel in the Region of Waterloo. Specifically, a pilot project was initiated to implement TDM initiatives at the sites of two large employers, namely the Grand River Hospital and Clarica Life Insurance. These sites are adjacent and together represent approximately 5,000 employees.

In this project, we have adopted a novel survey method for determining travel needs. A Web based survey tool was developed from which employee travel needs, transport mode preferences, and indifference statistics were obtained. The method has proved to be cost effective and has provided response rates of approximately 35%. Web-based survey results were supplemented with focus group interviews.

This paper describes (a) the development and implementation of the survey tool and an analysis of the survey responses; (b) how these results have been used to develop a suite of TDM options; and (c) lessons learned while attempting to implement the selected TDM options.

Introduction

Similar to many medium and large urban centres in Canada, the Region of Waterloo is experiencing continued and accelerated growth in transportation demand. This growth in demand is exceeding the rate at which capacity is being added. As a result, the level of service associated with transportation is generally declining. This decline in level of service is typically experienced by longer travel times, greater driver frustration, more congestion, and decreased air quality.

One method of mitigating these effects and maximising use of existing infrastructure is to decrease the number of vehicle trips. This can often be achieved by influencing travellers to change their mode of travel from single occupant vehicle (SOV) to more efficient alternative modes, such as public transit, carpool, walk, bike, etc. Travel Demand Management (TDM) is the name given to a wide range of initiatives that attempt to reduce SOV trips, encourage mode shift, and/or reduce demand for travel.

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This paper describes a pilot TDM project in the Region of Waterloo. The program is implemented at two large employers, Grand River Hospital (GRH) and Clarica Life Insurance (CLI), that have facilities located adjacent to each other. A total of approximately 5,000 employees work at these two sites.

This project was funded in part by Transport Canada through the ITS Deployment and Integration Plan. Six partners participated in the project: Clarica Life Insurance, Grand River Hospital, Paradigm Transportation Solutions Ltd., the Regional Municipality of Waterloo, Transport Canada and the University of Waterloo.

This paper is organised as follows: The next section describes the web-based survey tool. The subsequent section describes the results obtained from the survey and interprets what these results reveal about employee travel needs, preferences, and constraints. On the basis of these data, TDM initiatives are developed and described. Finally, the last section identifies several key lessons learned.

Development of Web-Based Survey Tool

Survey Development and Implementation

The identification of employee travel needs and constraints is required to develop a suite of effective TDM options. Traditionally, this information has been obtained using paper-based mail-back surveys or telephone surveys. However, these methods are expensive to conduct, often result in relatively low response rates, and require significant effort to manually transcribe the survey responses into an electronic database.

In this study, a web-based questionnaire survey was developed. The use of a web-based survey has several advantages over paper surveys, including ease of distribution, elimination of data entry effort, reduction of data entry errors, opportunity for response dependent survey branching, real-time error checking, and survey response entry tracking.

Separate questionnaires were developed for CLI and GRH employees to reflect differences in job categories (e.g. shift work at GRH), existing parking costs and parking availability. The survey questions were developed and reviewed by program partners. A web-site was established for the project (www.mobility-waterloo.org) and hosted on an internet service provider's server.

Both surveys consisted of questions aimed at obtaining three types of data, namely socio-economic/demographic data, revealed preference data (i.e. what travel choices employees current make), and stated preference data (i.e. what choices employees state they would make for a series of hypothetical conditions). Table 1 provides examples of questions in each of these 3 categories.

Table 1 - Typical survey questions

Components	Example	Note
Socio-Economic & Demographic	How old are you? Are you a licensed driver? What's your employment status? Where do you live?	Possible factors or constraints influencing mode choice.
Revealed Preference	For yesterday, what time did you leave work? For yesterday, did you STOP anywhere going home? For yesterday, how did you get to work?	Travel choices employees currently make given available options.
Stated Preference	What would ENCOURAGE you to carpool? What would LEAST ENVOURAGE you to take transit? If a monthly TRANSIT PASS cost \$15/M, how frequently would you take TRANSIT to work?	Travel choices employees say they will make under hypothetical conditions.

With the assistance of personnel at CLI and GRH, descriptions of the TDM project and the survey were developed and distributed to all employees via internal communication mechanisms. At CLI, where almost all employees have access to email, these descriptions were distributed electronically. The descriptions explained what the project objectives were, why the survey was necessary, and announced when the survey period began. Endorsement letters of support from senior management were included and proved very effective in encouraging employees to participate. Access to the web-survey was restricted until the specified date and subsequently was controlled via employee name and a password.

Employees were able to access the survey via the web from any PC - from work or home. Respondents were not required to complete the survey in one session but could save the survey and return to complete it at a later time.

To encourage employee participation, various prizes were awarded and CLI provided a \$5 donation to charity for each completed survey. Prize recipients were identified by selecting a name at random from employees who had completed the survey.

Survey Response Rates

The survey was launched at CLI on Monday December 4, 2000 and was taken offline on at the end of the day on December 15, 2000. During this 2-week period, a total of 1145 responses (33% of work force) were obtained. Of this total, 1080 responses were "complete"⁵ and the remaining 65 "incomplete"⁶.

Figure 1 illustrates the number of completed surveys as a function of time. At CLI, an internal electronic newsletter is distributed to all employees via email each Monday and Thursday at approximately 3:30 PM. During the survey period, articles were placed in the newsletter encouraging employees to participate in the survey. The impact of these reminders can be determined by examining the average survey completion rate during the 3-hour period from 3:30 PM to 6:30 PM on the days when the newsletter was distributed (i.e. Dec. 7, 11, and 14) and

⁵ "Complete" refers to whether or not the survey respondent indicated they had finished the survey and does not necessarily mean that all questions had been answered. If the respondent indicated they were finished the survey and one or more questions had not been answered, the respondent was informed that some questions had not been completed. The respondent could then return to those questions that had not been completed or indicate that the survey was complete and leave the web-survey.

⁶ "Incomplete" indicates that the respondent had not indicated they had finished with the survey, though they may have answered any number of the survey questions.

comparing this to the rate for the same time period on the days when no reminder was given. The average completion rate between 3:30 and 6:30 PM on days when the newsletter was distributed was 8.9 surveys per hour. The average rate for the same period for days when the newsletter was not published was only 2.2 surveys per hour. In contrast, the average rate between 3:30 PM and 6:30 PM on the first day of the survey launch was 39.3 surveys per hour! From these results it is apparent that while these communications had an immediate effect in terms of increasing the response rate, the increase was relatively small compared to the response rate on the first two days of the survey and there is little evidence to suggest that the impact extended to the next day.

It can also be observed that the response rate declined rather rapidly after the initial survey launch. This is illustrated more clearly in Figure 2, which shows the number of completed surveys per day as a function of the number of weekdays after the survey launch on December 4th, 2000. The launch occurred in the afternoon of Monday December 4th so most employees would not have had a chance to complete the survey on this day. The second day, Tuesday Dec. 5th had the highest response rate of 400 surveys completed. The response rate during the remaining days of the first week averaged approximately 100 surveys per day. The average response rate during the second week was only 42 surveys completed per day.

The vast majority of respondents (85%) completed the survey during work hours (8 AM to 6 PM). Only 1% of the surveys were completed during the period from midnight to 8 AM, and 14% were completed from 6 PM to midnight. On the basis of these results it seems likely that the vast majority of respondents completed the survey at work.

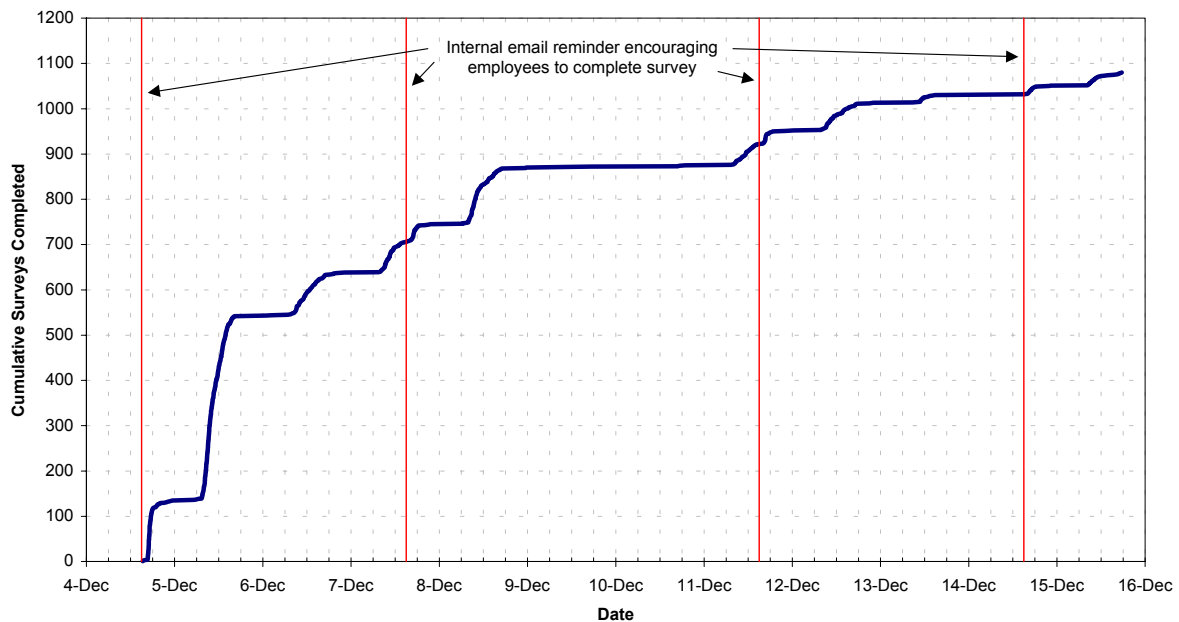


Figure 1: Cumulative number of completed surveys at CLI as a function of time

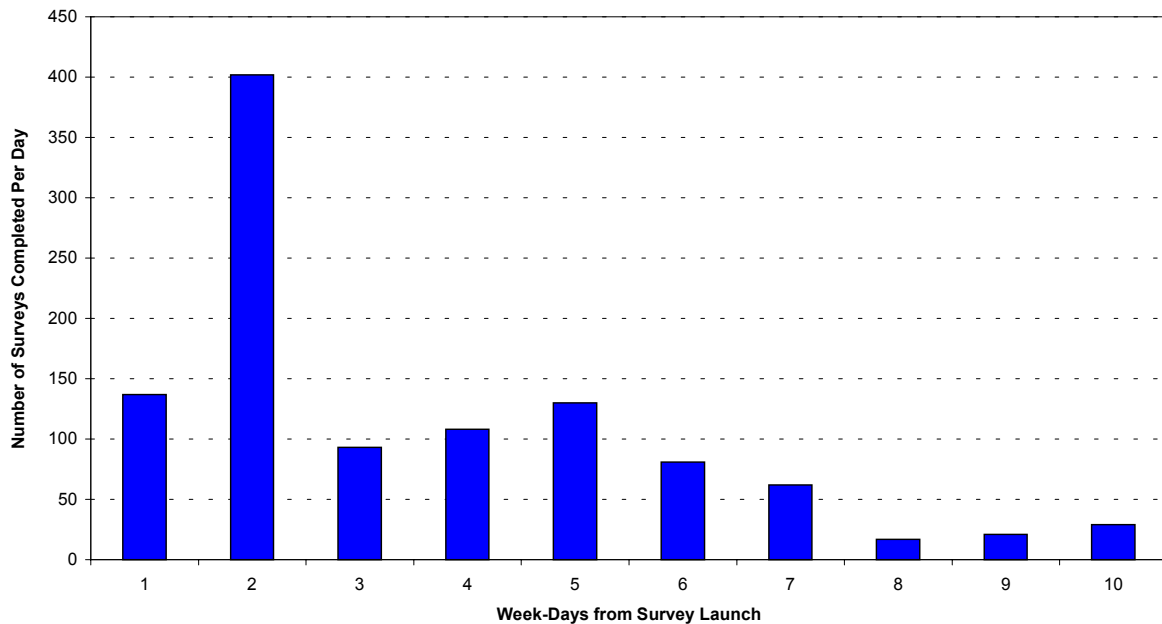


Figure 2: Decline in survey completion rate after initial launch date

The length of time required by respondents to complete the survey was tracked by recording the start time (the time when the respondent first entered the web site and accessed the survey) and the finish time (the time when the respondent submitted the survey as completed). Note that this method did not measure the actual time spent working on the survey. Thus, someone who started the survey one day but did not complete it until the next day, would have a survey completion time in the order of 24 hours. However, examination of the data revealed that the majority of respondents completed the survey in a single session. From these data, 88% of respondents completed the survey in less than 60 minutes, and 50% took less than 23 minutes.

The survey distributed at CLI was modified for use at GRH. Modifications were required as a result of differences in employment categories (i.e. part-time, shift-work, etc.) and travel options. It was also identified that only a small portion of employees at GRH had convenient access to the internet as part of their normal employment functions. Therefore, several PCs connected to the internet were deployed in the hospital cafeterias. Unfortunately, initial problems with internet connectivity resulted in slow access times and likely contributed to the low response rate. Paper copies of the survey were also distributed. Responses provided on the paper surveys were later entered into the database by project personnel. A total of 427 responses were obtained, representing 18% of the employee workforce at GRH.

These results lead to several important observations:

1. A relatively high response rate is possible using a web-based survey when employees have ready internet access at work.
2. People are much more likely to respond within the first few days of the survey launch when the issue is still on "the front burner" than several days after the launch.
3. Reminders about the survey have some impact on increasing response rate, but this impact is not large compared to the response rate in the first two days.

These observations have two important implications for conducting web-based surveys.

1. The time window during which it is possible to obtain employees' attention is very small (on the order of only a few days). Once that window is past, employees relegate the survey to the "I'll do it sometime" category. Consequently, it is essential that the web software perform without any glitches. Slow access times, errors in the survey, "access denied" server messages, etc. will quickly discourage people from completing the survey and as the results obtained in this project show, response rate declines rapidly after launch and appears very difficult to increase.
2. The survey launch needs to be preceded by a well designed publicity campaign to make employees aware of the survey, what it is being used for, and why their participation is important. The endorsement and support of senior management is critical.

Analysis of Traveller Needs and Constraints

A complete description of the insights gained into the travel needs and constraints of employees at CLI and GRH is not possible within the scope of this paper. However, we provide a summary of several of the important characteristics that have influenced the suite of TDM options implemented at CLI and GRH.

Demographics

The socio-demographic data obtained from CLI and GRH surveys indicated that:

- the workforce at CLI and GRH is predominately female (72% and 87%, respectively),
- the majority of employees are over the age of 35 years (57% and 82%, respectively),
- almost all respondents have a valid driver's license (98% at both CLI and GRH), and
- the occupational makeup at CLI is quite different from GRH as indicated by the number of full-time employees (90% at CLI and only 63% at GRH) and the proportion of CLI employees that work 5 days a week or more at the head office (93%) versus only 52% of GRH employees that work 5 days a week or more at the King Street Site of GRH.

These differences in employee profiles seemed to indicate that as the employee population was quite different, the travel needs and constraints of employees at the two sites was likely different as well.

Current Travel Mode Choices

One of the questions on the survey asked respondents to indicate what mode of travel they normally used to go to work. Figure 3 illustrates the relative proportion of employees at CLI and GRH that indicated they normally used each of ten modes of travel. These results indicate that 63% of CLI employees and 78% of GRH employees drive alone to work. A substantial portion of CLI employees participate in a carpool (14%) or walk (8%). A much smaller proportion of GRH employees participate in a carpool (3%) or walk (4%). The proportion of employees using public transit is approximately 3% at both GRH and CLI.

These differences observed in participation rates in carpool and walk may be reflective of different employment conditions and/or parking constraints. For example, GRH has a greater proportion of part-time employees, whose schedules typically have greater variability than full-time workers, and full-time employees who work shift work. Both of these characteristics are

likely to reduce the ability of employees to find suitable carpool partners. Parking constraints likely also had a significant influence. At the time of this study, there existed a significant under-supply (in the order of 900 stalls) of parking spaces for CLI employees when compared to typical parking requirements (0.8 stalls per employee) for office buildings. This under-supply of parking, combined with an existing car-pool program at CLI, likely explains why there is a higher proportion of CLI employees participating in carpools and walking.

These mode choice proportions are generally comparable to the averages for the Region of Waterloo (Drive = 84%; Passenger = 9.2%; Walk = 3.6%; Transit = 2.2%), though the proportion of CLI employees that drive alone is lower than the regional average, and the proportion that walk or participate in a carpool is higher than the regional average.

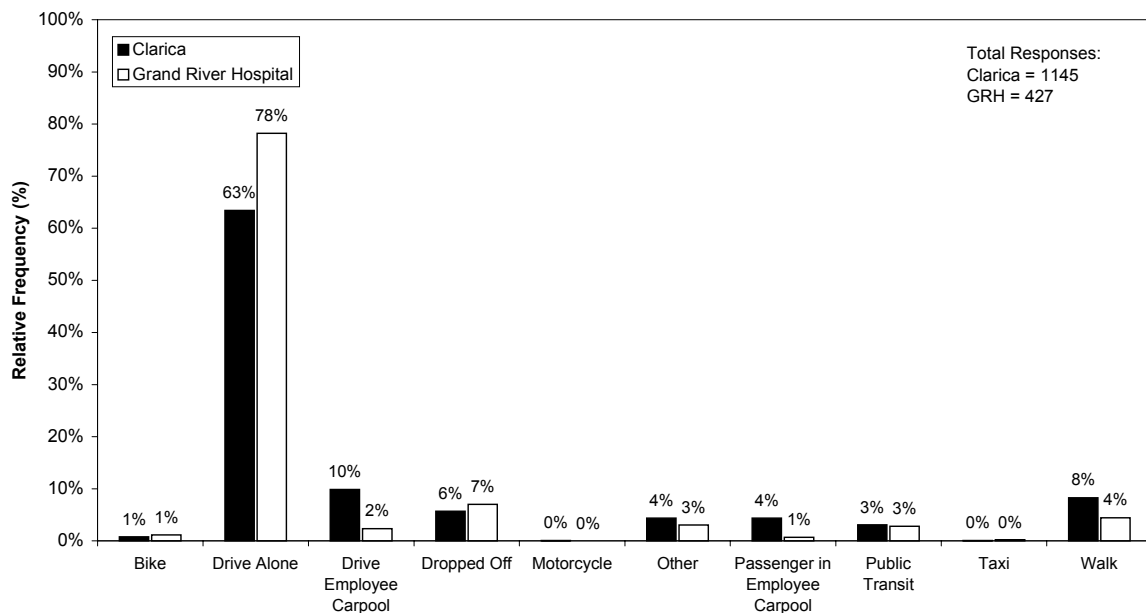


Figure 3: Proportion of employees who normally use each specified mode of travel to get to work

Why do people chose to drive alone?

Survey respondents who indicated that they drove alone to work were asked to indicate the top three reasons why they did so. The top three reasons cited by GRH employees for driving alone to work were:

1. I need my car before and/or after work for personal needs (cited by 49% of respondents);
2. I like the independence (cited by 41% of respondents);
3. Convenience (cited by 39% of respondents).

The top three reasons cited by CLI employees for driving alone to work were:

1. I need my car before and/or after work for personal needs (cited by 58% of respondents);
2. I like the independence (cited by 57% of respondents);
3. Convenience (cited by 55% of respondents).

The top three reasons and their relative order cited by GRH employees were identical to those cited by CLI employees. Of these three reasons, the first may represent a true constraint on mode choice, as the trip maker may need a car to satisfy needs prior to or after work. The remaining two reasons reflect personal preferences and perceptions rather than hard constraints.

In an effort to gain a greater understanding of true constraints, respondents were asked to indicate if they stopped anywhere on the way from home to work and whether they stopped on the way from work to home for trips made on the previous day. If they did stop, they were asked to indicate the reason for the stop from a list of 12 options. From these responses 58% of respondents indicated they did not stop on the way to work and 45% indicated they did not stop on the way home (Figure 5). This implies that for that particular day, only 42% of respondents stopped on their way to work and 55% stopped on their way home. These proportions are somewhat smaller than those reflected by the proportion of CLI respondents (58%) citing they drive alone as a result of a need for their car before or after work for personal need. Consequently, it is possible that people may over estimate their need for their vehicle for personal trips before or after work.

It is also interesting to examine the purpose of these chained trips. Approximately 32% of those respondents who stopped on their way home from work, did so to pickup or drop off either a passenger or a child, or stopped for a work related reason. Approximately 50% of respondents who stopped did so to buy coffee or gas, do shopping, go to bank, or pickup/drop off dry cleaning. These latter activities can typically be considered stops of convenience rather than necessity. In other words, these activities are done on the way home from work because the traveller has chosen to use auto as the travel mode and therefore it is convenient to make these stops enroute. However, if another mode of travel had been chosen, these activities would either have not taken place or would have been completed at some other time. Therefore, these activities may be more of an outcome of the mode choice rather than a constraint on the mode choice.

Nevertheless, it appears that the perception of employees is that these stops, including those stops of convenience, are necessary and have a significant influence on the choice to drive alone.

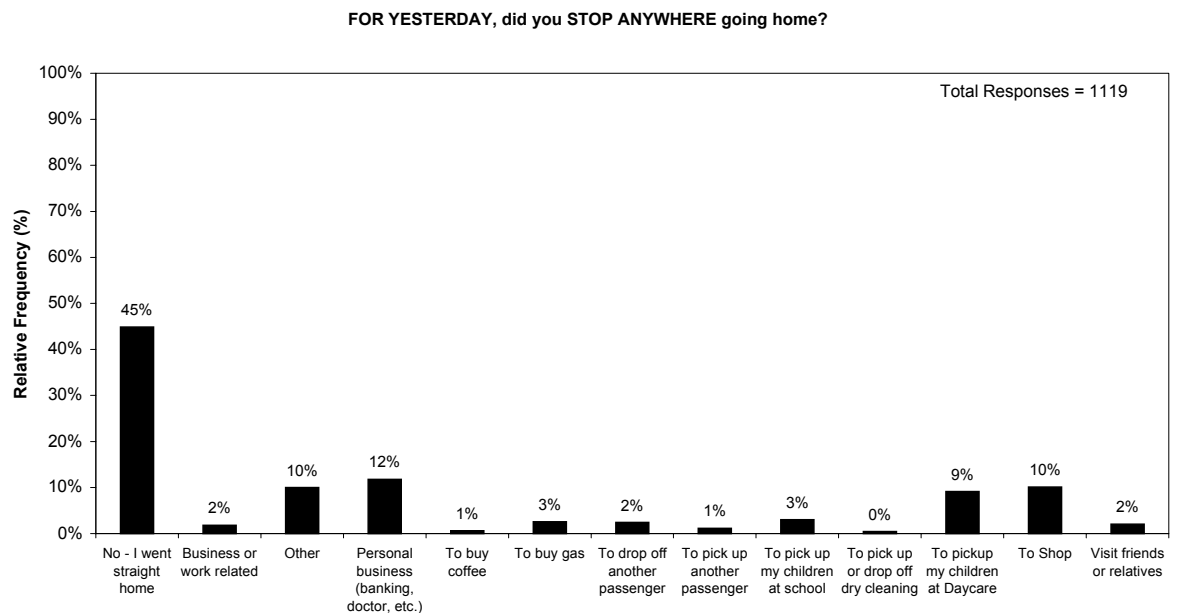


Figure 5: Proportion of Clarica employees who currently drive alone who made stops on the way home

Impediments to using non-auto modes

In an effort to determine what TDM strategies might be most effective at removing barriers to the use of alternative travel modes, respondents were asked to identify up to three strategies that would encourage them to participate in a carpool, to use public transit, and to walk or bike to work. The three most frequently cited strategies by CLI and GRH employees for each alternative mode are provided in Table 2. These results clearly indicate that a guaranteed ride home is viewed by both CLI and GRH employees as a very important strategy for encouraging the use of transit, participation in carpooling, and walking/cycling. Financial incentives, such as subsidised parking for carpool participants and subsidised transit for transit users, were also reported as important strategies.

It is also important to note that many of the employees who currently drive alone indicated they would not be encouraged to switch modes by any of the strategies identified. In fact, for those CLI employees who currently drive alone, 41%, 38%, and 60% stated that no strategy would encourage them to switch to carpool, transit, and walk/bike modes respectively. For those GRH employees who currently drive alone, 27%, 32%, and 55% stated that no strategy would encourage them to switch to carpool, transit, and walk/bike modes respectively.

It would seem clear that the suite of TDM strategies that are to be considered for implementation at the CLI and GRH sites in Waterloo should include a guaranteed ride home service, transit subsidy, a parking subsidy for carpool participants, and assistance in finding carpool partners.

Table 2. Most frequently cited TDM Strategies that would encourage use of alternative Modes

Employer	Alternative Mode	Top 3 Encouraging Options	% Pick
CLI Employees	Carpool	A guaranteed ride home in the event of emergency	37
		Help finding a carpool partner	23
		Free parking for carpools	22
	Transit	A direct service to work	50
		A guaranteed ride home in the event of emergency	28
		Company subsidy or pay raise for transit riders	27
	Walk/Bike	A guaranteed ride home in the event of emergency	23
		Designated bike routes between home and work	22
		Company subsidy or pay raise for cyclists/walkers	18
GRH Employees	Carpool	A guaranteed ride home in the event of emergency	43
		Help finding a carpool partner	32
		Free parking for carpools	23
	Transit	A direct service to work	55
		A guaranteed ride home in the event of emergency	32
		Company subsidy or pay raise for transit riders	20
	Walk/Bike	Designated bike routes between home and work	19
		A guaranteed ride home in the event of emergency	16
		Free showers and lockers	14

TDM Program Implementation

A suite of TDM program options were developed in co-operation with senior management from CLI and GRH. Institutional barriers and differences between existing cost structure for parking and carpool incentives resulted in the initial development of separate TDM strategies for each work site. It is recognised that greater overall mode shift and reductions in single occupant vehicle (SOV) travel would likely be achieved if certain TDM initiatives at each site were linked. These linkages will be pursued once experience with existing TDM initiatives has been acquired.

The TDM program implemented at CLI was marketed under the name of "Clarica in Motion". At GRH, the program is marketed under the name of "GRH Commutes". The TDM initiatives implemented at CLI and GRH are described in Tables 3 and 4 respectively.

Table 3: *Clarica in Motion* TDM program initiatives

Category	TDM Initiatives
Carpool	Electronic assistance in finding a carpool partner via an existing ride-matching service (www.carpool.ca)
	Reduced parking cost for carpool participants (75% reduction for 2 person carpool; 100% reduction for a 3 person carpool)
	Reserved preferential parking for carpoolers
Transit	Corporate bus pass. Employees save 15% over the regular rate.
	Sale of transit tickets on site.
	Free trial use of transit
Cycling	Free safe cycling seminar.
	Use of lockers and change rooms for <i>Clarica in Motion</i> members
Walking	Sale of city trail maps on site.
General	Guaranteed ride home service
	Casual use parking spots for those who regularly walk or bike to work but need to drive on a particular day.

Table 4: *GRH Commutes* TDM program initiatives

Category	TDM Initiatives
Carpool	Electronic assistance in finding a carpool partner via an existing ride-matching service (www.carpool.ca)
	Reduced parking cost for carpool participants (cost is divided by number of participants)
	Reserved preferential parking for carpoolers
Transit	Corporate bus pass. Employees save 50% over the regular rate
	Sale of transit tickets on site.
Cycling/ Walking	Safe and secure bike storage site
General	Guaranteed ride home service

Lessons Learned

1. The development and implementation of a TDM program requires the "buy-in" and support of senior management.
2. It is critical to know the travel needs and constraints of the employees so that TDM options of value to the employees can be developed.
3. A web-based survey is a cost-effective means of collecting survey data from an employee workforce that has convenient access to the web at work.
4. A variety of initiatives are required to meet the wide range of employee travel needs, constraints, and preferences.
5. Achieving success at reducing SOV travel is as much about developing awareness and education as it is about changing the actual characteristics of travel options.
6. It is important to find ways to provide meaningful rewards for those employees that choose alternatives to SOV travel.

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