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Research Seminar in Human Geography

PROJECT REPORT COVER SHEET

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Title: Travel Alternatives to the Workplace

Client: Peterborough Green-Up

Abstract

A transportation management strategy was conducted for Julian Blackburn Hall (JBH) using Dr. McKenzie-Mohr's Community-Based Social Marketing Approach. A total of 46 JBH employees participated in a survey that assessed barriers and attitudes towards alternative transportation. The results indicated a high percentage of single-occupancy vehicle use (74%), followed by carpooling (16%), walking or jogging (4%), public transportation (2%) and cycling (2%). Further analysis revealed strong barriers against alternative modes of transportation. One of the primary barriers that inhibits carpooling, is variable work shifts of the employees of JBH. Many of the employees live in rural areas and cannot take advantage of public transportation (i.e., bus). Finally, the work attire required at JBH was one of the primary barriers to active transportation (walking, jogging, cycling). Overall, the results suggest a lack of motivation to participate in alternative modes of transportation. Although employees realize the importance of a healthy environment, their unwillingness to overcome the perceived inconvenience (barriers) of alternative modes of transportation was too ingrained to invoke a behavioural change.

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Introduction

Peterborough Green-Up is a non-profit community environmental organization that provides information and support on matters of energy, waste, water, greenspace and transportation issues. Peterborough Green-Up encourages the Greater Peterborough community to participate in environmental actions that lead to a healthy and sustainable future. One leading goal is to foster action-oriented partnerships among the economic, social and environmental sectors of the Greater Peterborough community (See Appendix G). Therefore in collaboration with Peterborough Green-Up, this project aims to promote alternative modes of transportation that will benefit all sectors of the community.

The benefits of implementing a transportation management strategy are numerous for both the employee and the employer and include factors of saving time, money and staying healthy. For distances under 5 km, cycling is the usually the fastest mode of transportation and for distances under 2 km, walking or jogging are just as fast as cycling (Travel Options 2000). An automobile costs an average of \$7000 a year to operate while the costs of alternative modes of transportation are much less. Using active transportation increases physical activity and the reduction of automobile use or the use of public transit or ridesharing, generates a healthier environment for humans and the local ecosystem. The transportation demand management program for the region of Ottawa-Carleton, was implemented to use alternative modes of transportation to derive benefits such as: improved health and morale, reduced stress and monetary savings for staff; reduced parking requirements at work sites, with potential capital and operating cost savings; improved employee retention and access to the labour pool; and improved public perception of the region (Brousseau & McNally 2000).

The social marketing technique is based upon research in the social sciences that demonstrates that behavior change is most effective when delivered at the community level (McKenzie-Mohr & Smith 1999). A major focus of the technique is based upon removing the physical and mental barriers that deter a person from participating in an

activity while simultaneously enhancing the activity's benefits. Barriers are both internal and external, as defined by McKenzie-Mohr and Smith (1999). An internal barrier may exist due to lack of knowledge, non-supportive attitudes or an absence of motivation while an external barrier may exist due to lack of convenience to the individual. Therefore, the management strategy must identify both the internal and external barriers to create a successful management strategy.

The purpose of this project is to assess the general knowledge of the employees of two Peterborough employers, on the effects of transportation on the environment. The two Peterborough employers studied were Julian Blackburn Hall (JBH) and Peterborough City Hall. The attitudes and barriers of the managerial and employee commuters were assessed to determine what modes of transportation, instead of the single occupancy vehicle, can succeed at each workplace. The alternative modes of transportation include ridesharing, cycling, walking and public transit. The resources and tools needed by these organizations to implement a transportation management strategy were assessed through primary and secondary research.

General Information on Travel Alternatives

- active transportation has many direct and indirect health, productivity, and cost-saving benefits to employees, employers and the business.
- in 1992, 9.2 million Canadians, representing 92% of the total workforce, traveled to and from work in a typical weekday.
- active transportation (walking, jogging, cycling) is easily integrated into daily life by combining it with travel time.
- in Canada the number of cars per 1000 persons has doubled since 1960.
- the creation of new roadways to increase motor vehicle mobility, causes negative environmental impacts such as the destruction of ecosystems, interference with natural drainage and the prevention of migration patterns.

- approximately eight in 10 Canadians live within a cyclable distance of a routine destination, while another two in three say they would ideally like to cycle more often as a mode of transportation.
- if bike lanes were built, seven in ten working Canadians say they would use them to get to work.
- limited shower and locker facilities, and office buildings typically have physical environments that make cycling and in-line skating inconvenient, or even dangerous.

(Go For Green, 2001)

(Peterborough Green-Up 2000)

Environmental Aspects of Travel Alternatives

- Air quality decreases as the use of motor vehicles increases.
- there are more than 14 million cars on Canada's roads. Each travels an average of 16,000 kilometres and pumps out more than 4 tonnes of air pollutants a year.
- transportation in Canada produces 25% of greenhouse gas emissions that are responsible for poor air quality and negative human health effects.
- Transport Canada determined that 45% of greenhouse gas emissions produced by the average Canadian family comes from personal passenger vehicle, thus generating approximately half of Canada's smog-forming pollutants.
- active transportation helps reduce daily vehicle trips which reduce the amount of emissions in the atmosphere.
- each motor trip that is switched to active transportation (walking, jogging, cycling) avoids releasing 26 grams of hydrocarbon, 20 grams of carbon dioxide and 1.6 grams of Nitrogen Oxides per passenger mile.
- active transportation can help national and global commitments for pollution prevention and reduction of greenhouse gas emissions responsible for climate change / global warming.

(Go For Green, 2001)

Economic Aspects of Travel Alternatives

- active transportation reduces public expenditures on costly transportation infrastructure for motor vehicle modes of transportation.
- the annual cost of urban personal motor vehicle accidents, pollution congestion, parking, roads and land not paid by users is \$26.5 billion.
- in Canada, the environmental costs of transportation averages \$14-36 billion per year.

(Go For Green, 2001)

Health Aspects of Travel Alternatives

- a critical health risk of the new Canadian economy is employees who have become reliant on motor vehicle modes of transportation and do not participate in any physical activities.
- 63% of Canadians aren't active enough to achieve health benefits associated with daily physical activity
- by using active modes of transportation to and from work, people improve their health through physical activity and protect it by decreasing the impact of motor vehicle modes of transportation on our environment.
- maintaining appropriate body weight is one benefit of regular physical activity.
- improved vigor, self-esteem and a source of well-being come from physical health and in turn contribute to healthier and happier personal relationships and improved productivity in work situations.
- moderate physical activity reduces the risk of premature death, heart disease, obesity, high blood pressure, adult-onset diabetes, osteoporosis, stroke depression and colon cancer.

(Go For Green, 2001)

General Barriers to Adopting Travel Alternatives

- lack of motivation
- lack of skill
- lack of energy
- fear of injury
- problems with child care
- long-term illness
- feeling uncomfortable
- lack of safe places
- lack of support
- poor time management
- inflexible work shifts
- distance from home to work
- lack of shower and locker facilities at the workplace
- poor weather conditions
- a continued reliance on vehicles has created an unwillingness to use active modes of travel.
- the layout of the community (e.g., suburbs can increase the distance between activities and streets can create physical barriers to walking and cycling).
- lack of driver education and acceptance of active modes of transportation system has a significant effect on the comfort level of cyclists and pedestrian.
- age, health status and any physical limitations of the individual.
- local topography and geographical conditions.
- local traffic problems (volume, speed, timing).

(Go For Green, 2001)

The Alternative Transportation Management Studies

The two employers, Julian Blackburn Hall (JBH) and Peterborough City Hall, were chosen by our client, Peterborough Green-Up. The two potential workplaces were chosen due to similar work schedules, number of employees, types of jobs and potential for alternative modes of transportation at each workplace. Each workplace was approached through telephone and e-mail requests for permission to administer the alternative transportation study. Gate keepers at each workplace were contacted, however, Peterborough City Hall did not give permission for the study to be administered at their workplace (See Appendix A). Therefore, only JBH was used in the present alternative transportation management study.

The JBH alternative transportation management study was undertaken during the period of February 12, 2001 to March 9, 2001. The purpose of the study was to assess the employees barriers and attitudes towards alternative modes of transportation. The methodology for identifying the barriers was based on Mckenzie-Mohr's Community-Based Social Marketing Technique which involves four steps in developing a program to promote sustainable behaviour. The four steps are outlined below:

1. Identifying barriers to a sustainable behaviour (e.g., carpooling)
2. Developing a program through the use of behavioural change tools
3. Piloting the program
4. Evaluating the program's success

However, due to time constraints, only the first of the four steps was implemented to serve as a foundation for future studies by Peterborough GreenUp.

Identifying the Barriers to Travel Alternatives

The internal and external barriers for JBH must be identified before the transportation management strategy can be initiated. These barriers will be identified through focus groups and surveys.

A survey was administered to all employees of JBH to assess the barriers and attitudes and current modes of transportation (See Appendix B). The survey was designed according to Mckenzie-Mohr's list of survey criteria, which includes:

1. Clarification of the objective of the survey
2. List items to be measured
3. Writing the survey (avoid open-ended questions)
4. Conduct the survey
5. Analyze the data

These surveys along with the cover letter were administered to the employees through the in-house mailboxes. Two drop boxes were set-up within JBH for the participants to return their completed surveys. Signs were periodically placed throughout the workplace to serve as reminders for the employees to return their completed surveys. In addition, several visits to the lunch room were initiated to encourage a higher survey participation. Overall, participation in the surveys was voluntary and anonymous. The surveys were analyzed using both quantitative and qualitative methods. Microsoft Excel was used to determine the mean and percentages of the quantitative data. A summary of the additional comments made by the respondents were also presented.

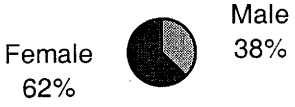
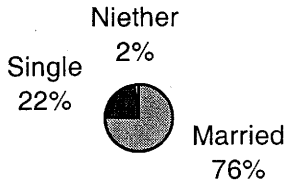
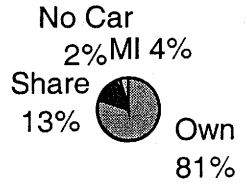
The focus groups were to be held after the analysis of the survey results, to gain a better understanding of the employees barriers at JBH. The focus group participants were generated from the survey. Those employees who were interested in participating in the focus group were requested to give their name, e-mail address and telephone number.

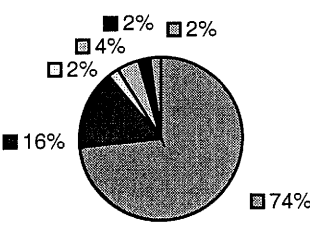
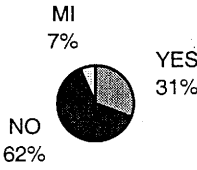
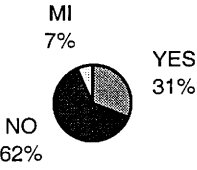
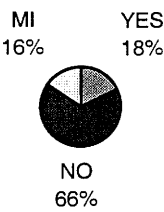
These potential participants were contacted by e-mail at a later date to confirm the time and date of the focus group meeting.

These potential participants were contacted by e-mail at a later date to confirm the time and date of the focus group meeting.

There were only five of the total forty-four respondents who indicated an interest in participating in a focus group on the survey. However, upon e-mailing these potential focus group participants, only one person responded. Therefore, due to an insufficient number of interested participants, the focus group was canceled.

Quantitative Results

<p>Fig. 1. <u>Julian Blackburn Hall Characteristics</u></p> <ul style="list-style-type: none"> The female respondents (62%) outweighed the male respondents (38%) by 24%. 	<p>Male and Female Survey Respondents</p>  <p>Female 62% Male 38%</p>
<p>Fig. 2. <u>Julian Blackburn Hall Characteristics</u></p> <ul style="list-style-type: none"> 76% of the respondents were married as opposed to 22% single and 2% were undefined. 	<p>Marital Status</p>  <p>Single 22% Married 76% Neither 2%</p>
<p>Fig. 3. <u>Julian Blackburn Hall Characteristics</u></p> <ul style="list-style-type: none"> 81% of the respondents owned a vehicle as opposed to 13% that shared a vehicle, 2% that had no vehicle and 4% that did not respond to this question. 	<p>Vehicle Ownership</p>  <p>No Car 2% MI 4% Own 81% Share 13%</p>

<p>Fig. 4. <u>Primary Mode of Transportation</u></p> <ul style="list-style-type: none"> 74% of the respondents used single-occupancy vehicles in their primary trips to and from the workplace, 16% used carpooling, 4% walked or jogged and 2% of the respondents used either public transportation, cycling or were missing data. 	<p>Primary Mode of Transportation to/from Work</p>  <table border="1"> <thead> <tr> <th>Mode</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Single-occupancy vehicles</td> <td>74%</td> </tr> <tr> <td>Carpooling</td> <td>16%</td> </tr> <tr> <td>Walking or jogged</td> <td>4%</td> </tr> <tr> <td>Public transportation, cycling, or missing data</td> <td>2%</td> </tr> <tr> <td>Public transportation, cycling, or missing data</td> <td>2%</td> </tr> </tbody> </table>	Mode	Percentage	Single-occupancy vehicles	74%	Carpooling	16%	Walking or jogged	4%	Public transportation, cycling, or missing data	2%	Public transportation, cycling, or missing data	2%
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<p>Fig. 5a. <u>Use of Alternative Mode of Transportation</u></p> <ul style="list-style-type: none"> 62% of the respondents did not carpool to and from work, as opposed to 31% of the respondents that did carpool and 7% of the respondents did not provide information on this question. 	<p>Percentage of Carpooling used to/from Work</p>  <table border="1"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>YES</td> <td>31%</td> </tr> <tr> <td>NO</td> <td>62%</td> </tr> <tr> <td>MI</td> <td>7%</td> </tr> </tbody> </table>	Response	Percentage	YES	31%	NO	62%	MI	7%				
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NO	62%												
MI	7%												
<p>Fig. 5b. <u>Use of Alternative Mode of Transportation</u></p> <ul style="list-style-type: none"> 62% of the respondents did not use public transportation to and from work, as opposed to 31% of the respondents that did use public transportation and 7% of the respondents did not provide information on this question. 	<p>Percentage of Public Transportation to/from Work</p>  <table border="1"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>YES</td> <td>31%</td> </tr> <tr> <td>NO</td> <td>62%</td> </tr> <tr> <td>MI</td> <td>7%</td> </tr> </tbody> </table>	Response	Percentage	YES	31%	NO	62%	MI	7%				
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<p>Fig. 5c. <u>Use of Alternative Mode of Transportation</u></p> <ul style="list-style-type: none"> 66% of the respondents did not walk or jog to and from work, as opposed to 18% of the respondents that did walk and jog and 16% of the respondents did not provide information on this question. 	<p>Percentage of Walking or Jogging to/from Work</p>  <table border="1"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>YES</td> <td>18%</td> </tr> <tr> <td>NO</td> <td>66%</td> </tr> <tr> <td>MI</td> <td>16%</td> </tr> </tbody> </table>	Response	Percentage	YES	18%	NO	66%	MI	16%				
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YES	18%												
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MI	16%												

<p>Fig. 5d. <u>Use of Alternative Mode of Transportation</u></p> <ul style="list-style-type: none"> 60% of the respondents did not cycle to and from work, as opposed to 31% of the respondents that did cycle and 9% of the respondents did not provide information on this question. 	<p>Percentage of Cycling to/from Work</p> <table border="1"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>NO</td> <td>60%</td> </tr> <tr> <td>YES</td> <td>31%</td> </tr> <tr> <td>MI</td> <td>9%</td> </tr> </tbody> </table>	Response	Percentage	NO	60%	YES	31%	MI	9%		
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NO	60%										
YES	31%										
MI	9%										
<p>Fig. 6a. <u>Barriers to Carpooling</u></p> <ul style="list-style-type: none"> 10% of the respondents did not carpool due to time constraints, 45% of the respondents cited a difficulty to find people to carpool with, 20% cited dispersed locations and 25% cited the need to drive children to school, as the primary reason preventing carpooling to and from the workplace. 	<p>Barriers to Carpool Participation</p> <table border="1"> <thead> <tr> <th>Barrier</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>9a</td> <td>10%</td> </tr> <tr> <td>9b</td> <td>45%</td> </tr> <tr> <td>9c</td> <td>20%</td> </tr> <tr> <td>9e</td> <td>25%</td> </tr> </tbody> </table>	Barrier	Percentage	9a	10%	9b	45%	9c	20%	9e	25%
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<p>Fig. 6b. <u>Barriers to Public Transportation</u></p> <ul style="list-style-type: none"> 78% of the respondents were not located on a bus route, 4% of the respondents stated that public transportation was too crowded, 11% of the respondents cited the bus schedule and 7% cited time constraints, as the primary reason preventing the use of public transportation to and from the workplace. 	<p>Barriers to Public Transportation Participation</p> <table border="1"> <thead> <tr> <th>Barrier</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>11a</td> <td>78%</td> </tr> <tr> <td>11e</td> <td>11%</td> </tr> <tr> <td>11d</td> <td>4%</td> </tr> <tr> <td>11f</td> <td>7%</td> </tr> </tbody> </table>	Barrier	Percentage	11a	78%	11e	11%	11d	4%	11f	7%
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<p>Fig. 6c. <u>Barriers to Walking or Jogging</u></p> <ul style="list-style-type: none"> 82% of the respondents cited distance, 9% of the respondents cited weather and 9% of the respondents cited time constraints, as the primary reason that prevent walking or jogging to and from the workplace. 	<p>Barriers to Walking or Jogging Participation</p> <table border="1"> <thead> <tr> <th>Barrier</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>13a</td> <td>82%</td> </tr> <tr> <td>13b</td> <td>9%</td> </tr> <tr> <td>13c</td> <td>9%</td> </tr> </tbody> </table>	Barrier	Percentage	13a	82%	13b	9%	13c	9%		
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13c	9%										

Fig.. 6d.

Barriers to Cycling

- 16% of the respondents cited time constraints, 13% of the respondents cited that they did not own a bicycle, 16% of the respondents cited the inability to carry work attire, 3% of the respondents cited road safety, 49% of the respondents cited distance and 3% of the respondents cited health problems, as the primary reason preventing cycling to and from the workplace.

Barriers to Cycling Participation

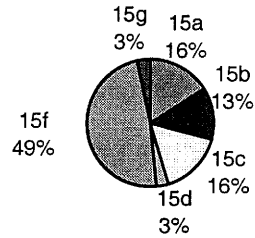


Fig. 7a.

Willingness to Participate in Carpooling

- 36% of the respondents were not willing to participate in carpooling to and from the workplace, 38% were somewhat likely, 4% were likely, 4% were quite likely, 9% would definitely participate and 9% of the respondents did not provide information on this question.

Willingness to Participate in Carpooling

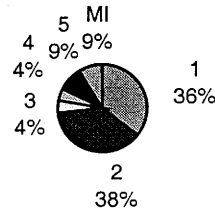


Fig. 7b.

Willingness to Participate in Public Transportation

- 65% of the respondents were not willing to participate in public transportation to and from the workplace, 11% were somewhat likely, 4% were likely, 7% would definitely participate and 13% of the respondents did not provide information on this question.

Willingness to Participate in Public Transportation

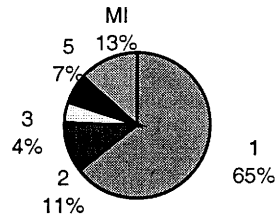


Fig. 7c.

Willingness to Participate in Walking or Jogging

- 63% of the respondents were not willing to participate in walking or jogging to and from the workplace, 13% were somewhat likely, 2% were likely, 4% were quite likely, 7% would definitely participate and 11% of the respondents did not provide information on this question.

Willingness to Participate in Walking or Jogging

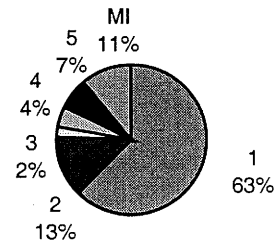


Fig. 7d.

Willingness to Participate in Cycling

- 51% of the respondents were not willing to participate in cycling to and from the workplace, 13% were somewhat likely, 16% were likely, 2% were quite likely, 7% would definitely participate and 11% of the respondents did not provide information on this question.

Willingness to Participate in Cycling

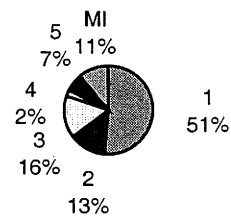


Fig. 8a.

Willingness to Participate in Alternative Transportation for Economic Reasons

- 22% of the respondents were not willing to participate in alternative transportation for economic reasons, 11% were somewhat likely, 24% were likely, 9% were quite likely, 16% would definitely participate and 18% of the respondents did not provide information on this question.

Willingness For Economic Reasons

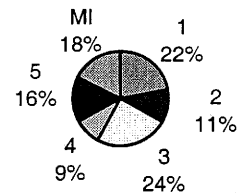


Fig. 8b.

Willingness to Participate in Alternative Transportation to Get to Know Colleagues

- 45% of the respondents were not willing to participate in alternative transportation to get to know colleagues, 20% were somewhat likely, 13% were likely, 4% were quite likely and 18% of the respondents did not provide information on this question.

Willingness to Get to Know Colleagues

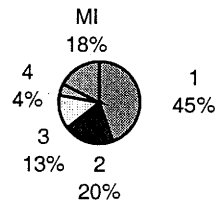


Fig. 8c.

Willingness to Participate in Alternative Transportation for Physical Fitness

- 11% of the respondents were not willing to participate in alternative transportation for physical fitness reasons, 4% were somewhat likely, 27% were likely, 29% were quite likely, 11% would definitely participate and 18% of the respondents did not provide information on this question.

Willingness for Physical Fitness Reasons

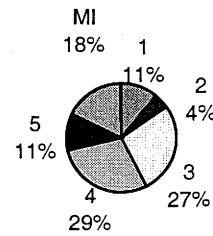


Fig. 8d.

Willingness to Participate in Alternative Transportation for Environmental Reasons

- 20% of the respondents were not willing to participate in alternative transportation for environmental reasons, 4% were somewhat likely, 7% were likely, 33% were quite likely, 18% would definitely participate and 18% of the respondents did not provide information on this question.

Willingness for Environmental Reasons

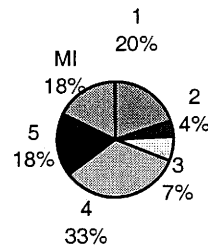


Fig. 8e.

Willingness to Participate in Alternative Transportation for Climate Change Reasons

- 20% of the respondents were not willing to participate in alternative transportation for climate change reasons, 9% were somewhat likely, 20% were likely, 20% were quite likely, 9% would definitely participate and 22% of the respondents did not provide information on this question.

Willingness for Climate Change Reasons

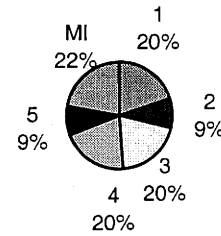


Fig. 8f.

Willingness to Participate in Alternative Transportation for Air Quality Reasons

- 17% of the respondents were not willing to participate in alternative transportation for air quality reasons, 17% were somewhat likely, 19% were likely, 17% were quite likely, 13% would definitely participate and 17% of the respondents did not provide information on this question.

Willingness for Air Quality Reasons

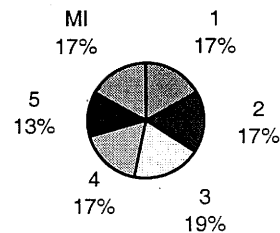


Fig. 8g.

Willingness to Participate in Alternative Transportation for Land Use Reasons

- 29% of the respondents were not willing to participate in alternative transportation for land use reasons, 11% were somewhat likely, 20% were likely, 13% were quite likely, 7% would definitely participate and 20% of the respondents did not provide information on this question.

Willingness for Land Use Reasons

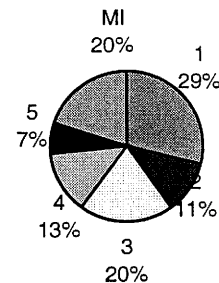


Fig. 9.

Responses to Single Occupancy Vehicle (SOV) Reduction

- 56% of the respondents stated that it is necessary for people to reduce their single-occupancy vehicle use, as opposed to 13% of respondents that stated it was not necessary and 31% of respondents which did not provide information on this question.

Responses to S.O.V. Reduction

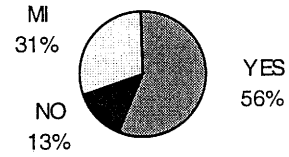
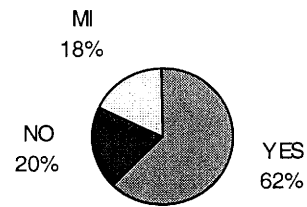


Fig. 10.

Willingness to Participate in Telecommuting

- 62% of the respondents stated that they would participate in telecommuting if it was an option, as opposed to 20% of the respondents would not participate and 18% of the respondents which did not provide information on this question.

Willingness to Participate in Telecommuting



Qualitative Results

Barriers to the Use of Alternative Modes of Transportation at Julian Blackburn Hall	
Category	Barriers
Carpooling	<ul style="list-style-type: none"> • Shift work, irregular hours • working overtime • time constriction (everyone must leave at the same time) • limits independence to come/go whenever pleased • unable to run errands to/from work • need to take children to school (on the way to work) • having to rely on other people (unexpected delay will make others late) • responsibility for the safety of others • only time to be alone • need own vehicle in case of emergency (children at school) • not interested in driving others
Public Transportation	<ul style="list-style-type: none"> • live in the country, not on bus route • city routes are insufficient, too many transfers • irregular bus schedules • city routes fail to keep on schedule • lack of availability, not frequent enough • time consuming, takes up to an hour to get to work • difficult to get to work on time • work schedule makes it difficult • expensive (bus pass) • Trent Express is often overcrowded (unsafe) • Trent Express is dirty, noisy, and some students are very rude • need to take children to school • likes the convenience of having your own car
Active Transportation (walking, jogging, cycling)	<ul style="list-style-type: none"> • difficult to pack clean, pressed clothes. Wrinkled clothes are inappropriate work attire • inconvenient to have to change before/after work • relatively few Casual Days • lack of showers at work • need to take children to school • not enough bike stands (cycling) • physical disabilities

Julian Blackburn Hall Employees' Attitudes Towards the Reduction of Single-Occupancy Vehicle Use

Positive Attitudes

- environmental reasons
 - air pollution
 - conservation of resources
 - greenhouse gas emission
- SOV are wasteful and unnecessary
- reduce traffic jams
- eliminate land use for parking
- reduce the number of vehicles on the road
- lack of parking
- reduce transportation cost (i.e., gas, parking)
- improve physical health and well-being

Negative Attitudes

- not realistic if you live in the country
- time consuming, unable to run errands before/after work
- inconvenient
- too many constraints (i.e., children)
- only problematic in crowded urban areas
- vehicle industries should be more responsible than individual users
- not necessary to reduce SOV use, the impacts on global pollution are negligible
- other companies create more pollution in one day than any family will in a lifetime (i.e., motor racing). Therefore these companies should be more responsible as they contribute 80% of the problem

Summary of Julian Blackburn Hall Study:

The results of the JBH transportation management study indicate that:

- alternative transportation is not a very important issue among employees in their routine trips to and from the workplace.
- a majority of employees use the single-occupancy vehicle (SOV) in their daily travels to and from work.
- of the alternative modes of transportation, employees were most willing to participate in carpooling and are least willing to use public transportation and walking/jogging.
- the primary barrier to carpooling is the difficulty to find people to carpool with. This is mainly due to the variable work shifts of JBH employees.
- the primary barrier to public transportation is that employees are not located on a bus route as many employees live in rural areas.
- the primary barrier to active transportation (walking, jogging, cycling) is distance. Again most employees live in rural areas which are on average 14.2 km from the workplace (with the greatest being 48 km).
- overall a majority of employees feel that it is necessary for people to reduce the use of SOV (62%) mainly due to environmental awareness. However, the perceived inconvenience of alternative modes of transportation is greater than their individual environmental concerns.

**Recommended Solutions for the Identified External Barriers of
Alternative Transportation to Julian Blackburn Hall**

External Barriers to Carpooling	Recommended Solution
Shift work	<ul style="list-style-type: none"> • ride-sharing programs within the same department and/or work shift • telecommuting
Need to take children to school	<ul style="list-style-type: none"> • Active and Safe Routes to School Program (www.goforgreen.ca) • arrange carpools with other parents to take children to school
External Barriers to Public Transportation	Recommended Solution
Insufficient bus system lack of availability irregular bus schedule	<ul style="list-style-type: none"> • provide a bus schedule for employees (make copies available at JBH) • more buses available at peak times (e.g., every 10 minutes during peak times)
Expensive	<ul style="list-style-type: none"> • discount bus pass (year round) for JBH employees
Trent Express overcrowded	<ul style="list-style-type: none"> • more buses available at peak times
Time consuming, too many transfers necessary	<ul style="list-style-type: none"> • increase the number of buses with shorter (more frequent) routes
External Barriers to Active Transportation	Recommended Solution
Work Attire	<ul style="list-style-type: none"> • use of facilities at the Athletic Complex • increase the number of Casual Days at JBH (e.g., Casual Fridays) • provision of ironing board at the Athletic Complex change rooms
Lack of bike stands	<ul style="list-style-type: none"> • increase bike stand availability around JBH

Recommendations for Replicating the Present Study

- contacts made to the workplaces need to be undertaken earlier in the study process. It was difficult for the present study as the method and the survey needed to be completed before the workplaces could be contacted.
- insure that there is a list of alternative workplaces in case the first choices do not grant permission for the study.
- client's preexisting workplace contacts may be useful in gaining entry to the workplace.
- if possible, an employees' email distribution list should be obtained from the gate keeper, so that reminders to complete the survey can be sent to the participants.
- include return date for the surveys on the cover letter, to generate a timely response by the survey participants.
- conduct observational studies before administering the surveys so that the employees have contact with the researchers.

Recommendations for Future Studies

- the most important factor determined through the initiation of this study, is that people have a 'real' connection with their motor vehicles that should not be taken lightly.
- it would be a mistake of the researcher to take this factor lightly and would result in a poorly executed alternative transportation management strategy.
- the best strategy is to acknowledge this dependence on the SOV and carefully implement strategies that wean the user slowly from the SOV (see below for Lunch-time Alternative Transportation Management Strategy).
- the researcher needs to keep track of the users progress to motivate users in 'real' terms (i.e., economic, environmental, health benefits).
- once a small step has been undertaken (i.e., lunch-time travel alternatives), the user will be more likely to participate in more alternative transportation activities (i.e., travel alternatives to the workplace).
- therefore the Lunch-time Alternative Transportation Management Strategy is recommended as a potential study (see Appendix C).

Conclusion

It has been determined through this study, that employees are dependent on the use of the single-occupancy vehicle (SOV) and as such, will require very sensitive methods to implement successful alternative transportation management strategies at the workplace. Environmental issues are important to people and may be an effective tool in implementing a successful alternative transportation management strategy. However, in the JBH study, people realized the effects that the SOV has on the environment, but they are unwilling consciously to overcome the barriers that prevent the use of alternative transportation to and from the workplace. It is essential to identify these barriers to the use of alternative modes of transportation, in order to create solutions to these barriers within the alternative transportation management strategy.

However, due to the negative attitudes towards travel alternatives to and from the workplace, it may be difficult to remove the barriers using the behavioural change tools identified by Dr. McKenzie-Mohr. If the behavioural change request is too great for the individual to accept, then they will not alter their attitudes despite any motivational tools used to promote alternative transportation. Perhaps a more appropriate strategy may be to promote a smaller behavioural change that in turn leads to larger behavioural changes in the future.

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Appendix A

Peterborough City Hall was contacted by telephone in mid-February, to request permission to administer the alternative transportation survey. An electronic survey as well as a cover letter describing the study, was e-mailed to the gate keeper of Human Resources to gain entry to the workplace. After a week, the gate keeper determined that the employees work schedules were too heavy to participate in the survey and therefore Peterborough City Hall could not be used in this study.

An alternative workplace (Lipton's Inc.) was suggested by our client to be approached for potential study. However, after several contacts made by our client to the gate keepers of Lipton's Environmental Department, it was decided that Lipton's would not participate in the study. Therefore, only Julian Blackburn Hall was included in this study.

Appendix B

Travel Alternatives to the Workplace

Dear Participant,

We are Trent University students conducting a research project for a 4th year research in human geography course taught by professors Alan Brunger and John Marsh. In collaboration with Peterborough Green-Up, we are designing a transportation management strategy for Julian Blackburn College. A transportation management strategy aims to limit the use of single-occupancy vehicles by promoting alternatives such as carpooling, public transit, cycling, walking or jogging. In order to design an effective program, we would like to identify attitudes to public and active transportation at your workplace.

The attached survey will help assess current transportation choices and workplace attitudes. Participation in the survey is voluntary and will be kept confidential. Please keep this introduction sheet and return only the completed survey to either the researcher (Angela or Mathew) while they are undertaking their afternoon observational studies at the main entrance to Blackburn Hall between 2:40 pm and 3:20 pm or deposit the completed survey into the drop box that is located in the security office at Blackburn Hall.

If you have any questions regarding our research or the survey, please contact us at:

aaau@trentu.ca (Angela)

OR

mlaing@trentu.ca (Mathew)

You may also contact Jackie Donaldson at Peterborough Green-Up at:

greenup@greenup.on.ca.

Your opinions and responses are valued and we thank you for your participation.

Sincerely,

Angela Au

Mathew Laing

Gender: M F
Occupation: _____
Distance from home to work (km): _____
Do you own/share a vehicle? _____

Status: Single Married
Work shift: _____

What is your primary mode of transportation to/from work (Please circle one)?

- Single-occupancy vehicle
- Carpooling: please specify the other passengers by type (i.e. colleagues, spouse): _____
and # people/car: _____
- Public transportation
- Walking or Jogging
- Cycling (seasonal)
- Other, please specify: _____

Have you ever used any of the following modes of transportation to/from work?

- Carpooling: Yes No
- Public transportation: Yes No
- Walking or Jogging: Yes No
- Cycling (seasonal): Yes No

Please indicate which of the following will most likely prevent you from participating in a carpooling program (please circle one).

- Time-consuming
- Difficult to find people to carpool with
- Dispersed locations
- Too crowded
- Drive children to school
- Other, please specify: _____

Comments: _____

Please indicate which of the following will most likely prevent you from taking public transportation to/from work (please circle one).

- Not on bus route
- Cost
- Weather
- Too Crowded
- Schedule (buses not frequent enough)
- Time-consuming
- Other, please specify: _____

Comments: _____

Please indicate which of the following will most likely prevent you from walking or jogging to/from work (please circle one).

- Distance
- Weather
- Time-consuming
- Health problems
- Other, please specify: _____

Comments: _____

Please indicate which of the following will most likely prevent you from cycling (weather permitting) to/from work (please circle one).

- Time-consuming
- Don't have a bicycle
- Work attire
- Road safety
- Bicycle lock-up / clothing locker
- Distance
- Health problems
- Other, please specify: _____

Comments: _____

Please indicate how likely you would be willing to participate in each of the following modes of transportation on a scale of 1 to 5.

	Not at all	somewhat likely	likely	quite likely	definitely
Carpooling	1	2	3	4	5
Public transportation	1	2	3	4	5
Walking or Jogging	1	2	3	4	5
Cycling (seasonal)	1	2	3	4	5

Please indicate on a scale of 1 to 5, how important each of the following reasons are in motivating you to participate in active and public transportation.

	not at all	somewhat unimportant	somewhat important	important	very important
To save money	1	2	3	4	5
To get to know colleagues	1	2	3	4	5
Physical fitness	1	2	3	4	5
Environmental reasons	1	2	3	4	5
Climate change	1	2	3	4	5
Air quality	1	2	3	4	5
Land use (ex. Parking Lots)	1	2	3	4	5

Do you think it is necessary for people to reduce their single-occupancy vehicle use? _____
 Why? _____

If telecommuting (work from home) was an option, would you like to participate? _____

Appendix C

Lunch-time Alternative Transportation Management Strategy

One significant problem with the present study is the size of our request. Although we have not implemented our alternative transportation management strategy, completing a survey which assesses transportation methods to the workplace is a large commitment. It may put the respondents in a situation where they feel that they are committed to alternative modes of transportation if they complete the survey. However, people will generally commit to a smaller, realistic request that is less demanding. This in turn may lead the respondents to commit to a larger request at a later date, due to an internal urge for individuals to behave consistently. Numerous studies have been conducted which demonstrated that individuals who agree to a small request are more likely to agree to a larger request.

- People who were asked to sign a petition in favour of supporting a recreational facility for the handicapped were more likely to make a donation. Ninety-two percent of those that signed the petition made a donation versus 53% of those who were not asked to sign the petition.
- Seventy-six percent of the people who agreed to place a small sign that said "BE A SAFE DRIVER" in their homes also agreed to placing a large obtrusive billboard that said "DRIVE CAREFULLY" on their front lawn.
- Of the people that were approached for questions about their soap preferences, these people were twice as likely than those that were not approached, to allow five or six people in their house to obtain an inventory of all the products.

The above evidence suggests that when people agree to a smaller request, they in turn are more likely to support a larger request on a later date. The idea is that when individuals commit to a small request, they begin to perceive themselves differently thus altering their initial attitude about the topic. They begin viewing themselves as a supporter of the initial request, and thus have a stronger internal pressure to behave 'consistently' when approached with a larger request.

Therefore, it is essential that any request be small and works into a larger request that in turn will be more successful in changing a person's behaviour, as defined by Dr. McKenzie-Mohr. From a transportation standpoint, it is quite a large request to ask employees to begin thinking about an alternative mode of transportation to and from the workplace. It may be more appropriate to look at reducing the number of single-occupancy vehicle use during the employees' lunch hour; thus promoting carpooling during lunch, or remaining at the workplace during lunch. Therefore, the initial idea of alternative modes of transportation is in the mind frame of the employees; and when approached with a larger request (i.e., travel alternates to the workplace), they may be more compelled to agree, in order to demonstrate 'consistent' behaviour. Hence, when the transportation management survey is administered at a later date, employees may be more supportive to return the surveys and participate in focus groups that allow the researcher to assess the barriers of the employees traveling to and from the workplace.

Therefore it is highly recommended that the present study begin with a smaller request such as assessing transportation methods during lunch hour. A general methodology is provided in the subsequent section to serve as a guideline for future studies.

PROPOSED METHODOLOGY

Study Area

The study area will be chosen by the client. When the study area is chosen, it is essential that contact with the gate keeper of the workplace be undertaken immediately. This allows for an alternate workplace to be requested if entry to the chosen workplace is not successful.

Community-Based Social Marketing Technique

Similar to the Travel Alternatives to the Workplace study, the methodology will follow Dr. McKenzie-Mohr's Community-based Social Marketing Technique. This project will follow that approach in designing a Lunch-time Alternative Transportation Management Strategy. As outlined by Dr. McKenzie-Mohr, there are four steps in developing a program that promotes sustainable behaviour. These include:

1. Identifying barriers to a sustainable behaviour
2. Developing a program through the use of behavioural change tools
3. Piloting the program
4. Evaluation of program's success

Although the Travel Alternatives to the Workplace study only undertook the first step, the first and second steps will be initiated for this Lunch-time Alternative Transportation Management Strategy. Once the employees' travel options at lunch are assessed, and barriers are identified, the researcher(s) will implement the second step of the social marketing technique. These involve the use of prompts as tools for behavioural change. Finally towards the end of the project, the researcher(s) will administer the Travel Alternatives to the Workplace Survey (used in the initial study), as a higher response rate and positive attitude of the employees will be attained.

Identifying Barriers

Barriers to sustainable behaviour (i.e., Lunch-time Alternative Transportation Management Strategy or bring your own lunch (BYOL)) must first be identified before the design of an effective management strategy can be initiated. These barriers can be identified through surveys and focus groups. A sample of the survey has been provided in Appendix C1. The participants will be asked on the survey to volunteer for a focus group meeting (similar to the Travel Alternative to the Workplace survey). Interested participants will be contacted by e-mail and will volunteer one half-hour of their lunch time to participate in the focus group discussion.

Tools of Behavioural Change

Once the barriers are identified and prioritized, it is important to overcome these barriers through the use of behaviour change tools. These “tools” can be used to overcome the barriers identified and to promote the design of the program. Once the program is designed, it is important to obtain ongoing feedback from the employees in order to redesign the program to suit their needs. There are a variety of “tools” identified to be effective in promoting behavioural change.

Commitment has been found to encourage behavioural change, especially written and publicized commitments. The present project aims to seek commitment from the employees through the distribution of commitment cards approved by Peterborough Green-Up. These cards will be attached to the surveys and will pledge the respondents to reduce their single-occupancy vehicle use during their lunch hour. These commitment cards will then be mailed to Peterborough Green-Up by the respondent to demonstrate their commitment. Their names will subsequently be added to the database of alternative transportation users at Peterborough Green-Up. Furthermore, these names will be publicized in several local newspapers.

Posters will serve as prompts to promote the program and serve as a reminder of the importance of alternative modes of transportation. These prompts must be self-explanatory, simple, eye-catching and be located close in proximity to where change is likely to take place (i.e., lunch room).

A third behavioural tool identified, is the use of effective communication. Depending on the workplace and the type of employers participating, it is essential to engage in appropriate means of communication to effectively deliver the message.

If/When you leave the workplace for lunch, what is your primary mode of transportation to/from workplace during lunch (Please circle one)?

Single-occupancy vehicle

Carpooling: please specify the other passengers by type (i.e. colleagues, spouse): _____
and # people/car: _____

Public transportation

Walking or Jogging

Cycling (seasonal)

Other, please specify: _____

Please indicate which of the following will most likely prevent you from staying at the workplace for lunch (please circle one).

Need time away from workplace

Need time away from colleagues

Not enough time to pack a lunch

Other, please specify: _____

Comments: _____

Please indicate which of the following will most likely prevent you from going home for lunch (please circle one).

Not enough time

Too far from home

Other, please specify: _____

Comments: _____

Please indicate which of the following will most likely prevent you from going out for lunch (please circle one).

Too expensive

Not enough time

Other, please specify: _____

Comments: _____

If/When you do leave the workplace for lunch, how likely are you willing to participate the following modes of transportation

	Not at all	somewhat likely	likely	quite likely	definitely
Carpooling	1	2	3	4	5
Public transportation	1	2	3	4	5
Walking or Jogging	1	2	3	4	5
Cycling (seasonal)	1	2	3	4	5

Do you think it is necessary for people to reduce their single-occupancy vehicle use? _____
Why? _____

Do you think that encouraging employees to stay at the workplace for lunch or encouraging alternate modes of transportation will have an impact on reducing the use of single-occupancy vehicle?

No impact Small impact Significant impact
1 2 3

TIME TABLE

The placement should begin early October and end in late-April. It will be a two-student study for each workplace, totaling approximately 280 hours. The schedule for completion of the project will be as follows:

MONTH	WORK TO BE DONE	TOTAL HOURS (for 2 people)
Early October	Organization orientation	10
Middle October to Late October	Literature Review	30
Early November	Project organization and Outline	15
Early November	Proposal and Presentation	10
Middle November to Early December	Contact Workplace and Administer Lunchroom Surveys; Focus Groups	30
Middle December to Early January	Analysis of survey and focus groups results	30
Early January to Late February	Implement lunchroom study: use of behavioural change tools, commitment prompts	60
Middle February to Early March	Administer Travel Alternatives to the Workplace Survey (same workplace)	15
Middle March	Analysis of survey results	20
Late March	Final Write-up and Presentation	40
Ongoing	Meetings with Staff	20

Appendix D

THE
ALTERNATIVE TRANSPORTATION
COMMITMENT

I pledge to reduce my single-occupancy vehicle trips by using alternative modes of transportation.

I will use ___ public transit ___ (# / week)
 ___ carpooling ___ (# / week)
 ___ walking / jogging ___ (# / week)
 ___ cycling ___ (# / week)

Signature _____ Date _____

Name _____

Address _____

Can we post your name (not your address) to thank you publicly and inspire others?

___ Yes ___ No

Check the publication (choose 1 or all):

___ The Peterborough Examiner
___ The Recycling News
___ The Trent Arthur

Thank you for your commitment!

PETERBOROUGH
GREEN-UP

Peterborough Green-Up
Peterborough Square
360 George St. N., Unit 42
Peterborough, ON
K9H 7E7

Appendix F

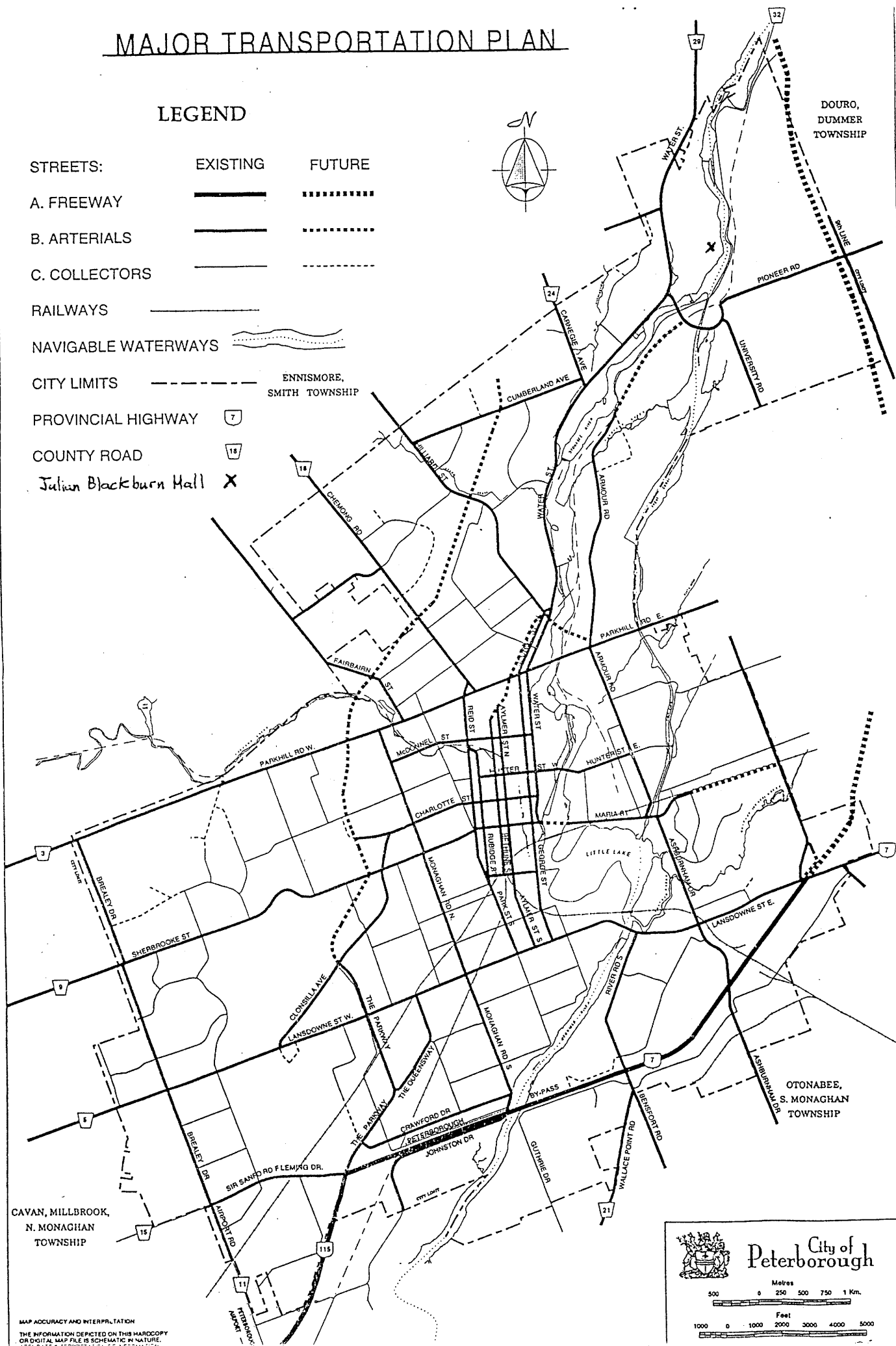
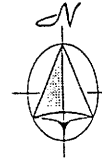
Focus Group Questions: Identify the Key Barriers to Alternative Transportation


1. Do you feel that Peterborough driving is congested and if so
 - a, where specifically? and
 - b, what specifically are the causes?
2. Do you think that public and active modes of transportation could decrease the traffic congestion in Peterborough?
3. What are the barriers to using public transit when traveling to and from work?
4. What are the barriers to using carpooling when traveling to and from work?
5. What are the barriers to cycling to and from the workplace?
6. What are the barriers to walking and or jogging to and from the workplace?
7. What would motivate greater participation in public transit to and from the workplace?
8. What would motivate greater participation in carpooling to and from the workplace?
9. What would motivate greater participation in cycling to and from the workplace?
10. What would motivate greater participation in walking and or jogging to and from the workplace?
11. What are the main concerns in traveling from home to work?
12. What are the main concerns in traveling from work to home?
13. How could your workplace make alternative modes of transportation more attractive to you?
14. Do you have any suggestions of how to generate alternative modes of transportation at your workplace?

MAJOR TRANSPORTATION PLAN

LEGEND

STREETS:	EXISTING	FUTURE
A. FREEWAY		
B. ARTERIALS		
C. COLLECTORS		
RAILWAYS		
NAVIGABLE WATERWAYS		
CITY LIMITS		
PROVINCIAL HIGHWAY		
COUNTY ROAD		
Julian Blackburn Hall		





Peterborough

Metres
0 250 500 750 1 Km.

Feet
0 1000 2000 3000 4000 5000

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