

**A Work Commute Trip Reduction Strategy for The Vancouver Police Department: An
Exploration of Opportunities and Barriers at the Graveley Campus**
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Table of Contents

EXECUTIVE SUMMARY	5
KEY RECOMMENDATIONS	6
COMMUTE TO VPD GRAVELEY CAMPUS	7
SURVEY AND FOCUS GROUP FINDINGS	9
SURVEY	9
HIGHLIGHTS FROM THE SURVEY	9
BARRIERS AND OPPORTUNITIES IDENTIFIED IN THE SURVEY	11
FOCUS GROUPS	13
ACTION PLAN	15
WORK COMMUTE TRIP REDUCTION STRATEGIES FOR VPD	15
SOCIAL MARKETING AND MARKETING OF COMMUTE TRIP REDUCTION STRATEGIES	21
CONCLUSION	24
APPENDIX 1: SURVEY RESULTS	26
APPENDIX 2: LIST OF USEFUL WEBSITES	33
APPENDIX 3: DESCRIPTION OF VARIOUS COMMUTE TRIP REDUCTION PROGRAMS	34
APPENDIX 4: CASE STUDIES	38
APPENDIX 5: RESOURCE DOCUMENT	44
APPENDIX 6: COMMUTE TRIP REDUCTION TABLES	46

Executive Summary

This report explores sustainable commute options for the staff driving to and from the Vancouver Police Department's (VPD) Graveley Campus. As stated in the VPD 2012-2016 Strategic Plan, the VPD is striving to reduce its carbon footprint "by reducing, reusing, recycling and using innovative methods to better utilize resources through its Code Green program" (Vancouver Police Department, 2012, p. 26). By encouraging staff to "green" their commute, this project addresses both this goal and the following strategies outlined in the 2015 VPD Business Plan:

- To continue implementing policies and practices consistent with the City of Vancouver's (COV's) sustainability framework and initiatives;
- Ongoing promotion of a "green culture" within the VPD;
- To continue reducing vehicle emissions at the VPD.

In addition, by helping the VPD to further "green" its operations, this project contributes to the Greenest City 2020 Action Plan Goals of Climate Leadership and Green Transportation¹.

To better understand how the staff commutes to work and why they have chosen their mode of transportation, a work commute survey was made available to all VPD staff, and two focus groups were held at the VPD Graveley Campus. This report reviews the results of the survey and focus groups, defines the most commonly used Commute Trip Reduction (CTR) strategies, and highlights the steps that can be taken to introduce a CTR program for staff commuting to VPD's Graveley Campus. Taking into account the principles of social marketing, this report offers steps in promoting more sustainable commuting options. Over 170 VPD staff members contributed to the creation of this report. The recommendations made in this report are based on the feedback received from the staff who participated in focus groups, an online survey and in-person conversations.

Changing work commute patterns is a challenging task for any organization. However, through collaboration with VPD employees, this challenge can be overcome. Building on the existing extraordinary achievements of the staff in "greening" the VPD's operations and creating a culture of sustainability, the VPD can facilitate the implementation of sustainable commute practices within the organization. This will ensure that the VPD continues to demonstrate leadership in all areas of policing in North America.

¹ Climate Leadership Goal: Reduce community-based greenhouse gas emissions by 33% from 2007 levels. Green Transportation Goal:

Key Recommendations

The main objective of this report is to identify how staff commuting to the VPD Graveley Campus can be encouraged to carpool and take public transit. The report explores this question by analyzing the current trends in how the staff commutes to work and then suggests an action plan to encourage behaviour change. Below are the key recommendations highlighted in the report:

- 1) **Consider creating a coordinated commute demand management program which could include the following elements:**
 - a. Financial incentives that support staff to change their mode of transportation. This includes subsidized employee bus passes, subsidized parking for carpoolers and parking cash-out;
 - b. Shuttle services to and from the SkyTrain;
 - c. Ride-share program;
 - d. Parking management strategy to finance a commute demand management program;
 - e. Guaranteed ride home program;
 - f. Contacting the City of Vancouver Sustainability Group for information regarding their Sustainable Commute Program.
- 2) **Use elements of social marketing to promote a commute demand management program and to influence the culture of the organization.**
- 3) **Engage staff in the process of creating change;**
- 4) **Create partnerships with organizations that promote demand management strategies such as TransLink's TravelSmart Program.**

Commute To VPD Graveley Campus

National Trends in Work Commute

In 2010, 82 per cent of Canadians commuted to work by car, 12 per cent took public transit and 6 per cent walked or cycled (Turcotte, 2011). According to a national study done by Martin Turcotte titled “Commuting to Work: Results of the 2010 General Social Survey”, the majority of Canadians commute to work alone in their personal vehicles. Turcotte concluded that this was mainly due to the average transit commute time being nearly twice the average vehicle commute time (44 minutes versus 27 minutes), despite transit trips being shorter by distance on average. Another reason that Canadians use their cars is that living in low-density residential areas is not conducive to taking transit. People who live in suburbs have less access to public transportation and have to travel greater distances to get to work. Long commute distances between home and work and lack of adequate access to fast public transit are the two main reasons that Canadians rely on their cars (p. 33).

Commute to VPD

The Vancouver Police Department operates out of two major campuses: Graveley Campus, located at 3585 Graveley Street, and Cambie Campus, located at 2120 Cambie Street. Graveley Campus is located in an industrial area close to the intersection of Boundary Road and Highway 1. Because of its industrial nature, the area is isolated, lacks good pedestrian connectivity, and has relatively poor lighting. Graveley Campus is close to two transit lines, bus number 28, which runs every 15 minutes from Joyce Collingwood Station to Phibbs Exchange, and bus number 9, which runs between UBC and Boundary Road.

Roughly 400 staff members commute to the Graveley Campus in an average week. Similar to the trends observed in a 2011 National Household Survey, which indicates that four in five Canadian workers commute to work in their private cars, the majority of the staff working at the Graveley Campus travel to work in personal cars, trucks, or vans. Of those who responded to the work commute survey, 70 per cent of Graveley staff drive alone, 11 per cent use public transit, 11 per cent carpool, 3 per cent walk and bike, and 8 per cent use a combination of modes, such as being dropped off by a spouse (some staff chose more than one mode, such as drive alone some days and take transit other days). Staff commuting to the Graveley Campus report similar reasons to the rest of Canadians for using their cars, such as lack of access to the transit system, convenience, and the length of time that it would take them to commute (Turcotte, 2011, p. 33). In addition to these common challenges, staff also expressed shift work, early start times, and long days as other reasons that they commute with their cars.

The next two sections explore the opportunities and barriers that exist in promoting alternatives to driving alone to work based on what staff identified in the work commute

survey and focus groups. This report focuses primarily on those strategies that could encourage staff to carpool and take transit and briefly mentions attitudes toward cycling.

Survey and Focus Group Findings

Both qualitative and quantitative methods were employed to identify how the staff commutes to work.

Survey

Objectives and Research Method

A survey questionnaire was designed to explore the commute trends prevalent amongst the VPD staff commuting to work every day. The survey questions were designed in a way to maximize the input from staff.

The survey questions covered the following areas:

- Commuting modes used;
- Commuting details including time of day of travel and distance and duration of commute;
- Reasons for mode choice and barriers to alternate modes of transportation;
- What incentives and initiatives could facilitate a mode change.

The survey was designed to primarily identify barriers and opportunities that exist for staff commuting to the Graveley Campus but was also made available to all VPD staff. The staff was invited to participate in the survey through a bulletin on the VPD intranet. In addition, information about the survey was posted on bulletin boards and in elevators, and emails were sent out to some small workgroups and committees. The survey was available from July 22, 2015 to August 14, 2015. The survey was closed on August 14, and the results were downloaded for tabulation. In all, 168 people completed the survey. Please note that not everyone responded to all of the questions. The total number of people who completed each question is specified in each table.

Highlights From the Survey

Survey Participants

Of 168 people who completed the survey, the majority work at Graveley Campus.

Location	Number of Participants	Percentage of the Participants
Spyglass	0	0%
Glen Drive	2	1%
Jail	1	1%
Other	6	4%
Cordova Annex	9	5%
Cambie	26	15%
Graveley/Kootenay	124	74%
Total	168	100%

Table 1: Breakdown of survey participants based on worksite

Work Schedule

VPD staff work various shifts. Compressed workweek is the most common shift selected by respondents.

Staff Shifts	VPD	Graveley
9-Day fortnight	6%	8%
Regular shift, 4 on, 4 off	15%	9%
Rotating/Variable shifts, 4 on, 4 off	15%	11%
Standard workweek, Monday to Friday, 5 on, 2 off	22%	25%
Compressed workweek, 4 on, 3 off	41%	47%
Total	168	121

Table 2: Breakdown of work schedule selected by survey participants

Geographical Dispersion

One hundred and fifty survey participants provided their postal code.

Municipality	Total Number of Staff	Percentage of staff
Richmond	2	1%
New Westminster	4	3%
Mission and Abbotsford	5	3%
Delta and Tsawwassen	6	4%
Langley	6	4%
North Vancouver, West Vancouver and Lions Bay	11	7%
Pitt Meadows and Maple Ridge	15	10%
Burnaby	15	10%
Tri-Cities	18	12%
Surrey	21	14%
Vancouver	48	32%
Total	150	100%

Table 3: Breakdown of geographical dispersion. Please note that the municipalities are grouped based on population

Staff Mode Choices

Survey participants reported that they most commonly get to and from work by driving alone (70%), followed by public transit (9%), carpool (6%), bike (5%), and other methods, including multiple modes (8%). These trends are similar to those identified by Graveley staff with the exception of carpooling (11% vs. 6%) and biking (2% vs. 5%).

Mode Choice	VPD Staff		Graveley	
Walk	3	2%	1	1%
Bike	8	5%	2	2%
Carpool	10	6%	13	11%
Other or combinations	13	8%	8	7%
Public transit	15	9%	13	11%
Drive alone	114	70%	86	70%
Total	162		123	

Table 4: Breakdown of staff mode choice (more than one option could be selected).

For complete survey results, please refer to Appendix 1.

Barriers and Opportunities Identified in the Survey

Why Staff Drive Alone

As stated under “Staff Mode Choices” above, 70 per cent of the survey participants drive to work alone every day. Participants who drive alone were asked if they have ever considered another mode of transportation. The table below shows the percentage of people who drive alone but have considered another mode of transportation. It also summarizes the major factors that prevent staff from switching to another mode.

Common Themes: Barriers to mode shift for those that drive alone						
Percentage that have considered:	Carpooling		Public Transit		Cycling	
	VPD	Graveley	VPD	Graveley	VPD	Graveley
	61%	50%	53%	60%	35%	32%
Common themes identified:	Not knowing who to carpool with		Long commute time		Long commute distance	
	Frequent changes to work schedule		Cost of transit		Safety and weather concerns	
	Having to work overtime frequently		Lack of access to public transit		Not owning a bike	
	Limited start/end work time flexibility		Inadequate transit service during early morning hours and late nights			
	Having to pick up children and run errands during commute		Having to pick up children and run errands during commute			
	Having to drive to multiple sites and for meetings		Safety concerns			

Table 5: Factors that prevent staff from choosing an alternative mode to driving alone

What Would Encourage Staff to Change Their Commute Mode

People who drive alone were asked what would encourage them to shift to a different mode of transportation. The three tables below summarize what the staff identified as potentially helpful. Please note that respondents could select more than one answer.

Staff who drive alone but are interested in taking transit have identified employer-subsidized bus passes, a shuttle service to and from SkyTrain, and flexible work start and finish times as the top three desirable programs (see Table 6).

What would encourage staff to take transit			
Incentives Programs	Public Transit Programs:	Percentage of staff who selected this program	
		VPD	Graveley
	A car-sharing station close by	6%	6%
	Information about transit resources	8%	7%
	A vehicle to use for personal trips during the day	12%	12%
	Guaranteed ride home	19%	18%
	Flexible work start and finish times	28%	28%
	A shuttle service to work from SkyTrain and back to SkyTrain	34%	35%
	Employer-subsidized bus passes	54%	41%

Table 6: Programs that would encourage staff who drive alone to take public transit

Staff who drive alone but are interested in carpooling have identified a website to connect with others, a discount on parking for carpoolers, and flexible work start and finish times as the most important incentives that would encourage them to carpool (see Table 7).

What would encourage staff to carpool			
Incentives Programs	Carpooling Programs:	Percentage of staff who selected this program	
		VPD	Graveley
	A car-sharing station close by	5%	4%
	A vehicle to use for personal trips during the day	14%	10%
	A priority parking spot for carpoolers	28%	28%
	Guaranteed ride home	26%	28%
	Flexible work start and finish times	33%	32%
	Discount on parking for carpool cars	38%	33%
	A website to connect with others	46%	43%

Table 7: Programs that would encourage staff who drive alone to carpool

In response to the question “Have you ever considered biking to work?”, 61 per cent of participants responded that they would never cycle to work. When asked what would encourage the staff to cycle to work, having secure and convenient parking facilities, a

guaranteed ride home, and a vehicle to use during the day were the three most selected answers (see the complete list below).

What would encourage staff to cycle			
	Cycling Programs:	Percentage of staff who selected this program	
		VPD	Graveley
Incentives Programs	A car-sharing station close by	3%	3%
	Safety training	11%	9%
	Information on bike routes	11%	9%
	A vehicle to use for personal trips during the day	8%	7%
	Guaranteed ride home	10%	8%
	Secure and convenient bicycle parking	19%	11%

Table 8: Programs that would encourage staff who drive alone to cycle

Focus Groups

Methodology

Two focus groups were held to explore with the staff what opportunities exist to promote alternative commuting options and the barriers that prevent their implementation. Borrowing from social action and participatory research theory, focus groups were perceived not just as a place where people come in and share their thoughts, but also as a place in which co-workers will come together to support each other and help each other take the next steps. During the focus groups the participants were asked to talk about how they get to work, why they chose a particular mode, and what barriers exist to using a more sustainable mode of transportation. In addition, one staff member in each focus group who was already carpooling spoke about her experiences.

Key Insights From Focus Groups

Barriers identified:

- Inadequate access to public transit;
- Fear of not being able to get home on time;
- Misconceptions about carpooling;
- Unreliable and crowded buses;
- Long commute times and lack of bus schedule flexibility;
- Lack of bicycle routes through tunnels and over bridges;
- Cost of using public transportation.

Opportunities identified:

- Able to enjoy other people's company or read when carpooling or taking transit;
- Can potentially save money;
- Allows staff to unwind and be mentally prepared for their family;
- Able to use HOV lanes.

Overall, 16 people participated in the focus groups and all found it helpful. The focus groups gave everyone a chance to share their ideas and collectively think about methods of reducing single occupancy commutes. The participants agreed that they were more likely to carpool after hearing the experiences of their colleagues who are already carpooling. This was a great achievement that can be built on.

Action Plan

Work Commute Trip Reduction Strategies for VPD

What is a Work Commute Trip Reduction Program

Work Commute Trip Reduction (CTR) programs, also known as Employee Trip Reduction or Vehicle Trip Reduction programs, provide commuters with resources and incentives to reduce their automobile trips (Commute Trip Reduction, 2013).

According to the standards set by the United States Environmental Protection Agency, Commuter Choice Program, the highest rated commute trip reduction programs include (Commute Trip Reduction, 2013):

- Guaranteed ride home;
- Employer-paid transit/vanpool benefits where the employer provides at least \$30 per month in benefits or the full value of commuting costs;
- Parking cash-out;
- Telecommuting.

Other incentive programs include:

- Ride-share or carpool matching;
- Shuttle from transit stations;
- Secure bicycle parking, showers, or lockers;
- Financial incentives for walking or cycling.

Choosing the Right Commute Trip Reduction Program For VPD

In order to identify best practices in work commute trip reduction, the Cities of Toronto, Vancouver, and Maple Ridge, and E-comm 911 were contacted (refer to Appendix 4), and best practices from other North American cities were surveyed through a literature review. In addition, through conducting a work commute survey and two focus groups, the Graveley Campus staff was consulted to identify programs that would encourage them to carpool, take public transit, or cycle to work. Based on the survey results and what other cities have been doing, the top demand management programs that VPD could use include: financial incentives, shuttle services, ride-share program, parking management, and guaranteed ride home.

The next five sections analyze the return of these programs and present an action plan for each. Please refer to Appendix 6 for the complete list of various incentives programs and their projected return value based on research and analysis of best practices by transportation scholars (Commute Trip Reduction, 2013). Please note that the survey participants identified flexible work start and finish times, as defined in Appendix 3, as one of the strategies that would help them to take transit or carpool. However, due to the nature of the work done at the Graveley Campus, it was decided that this option is not possible for many staff.

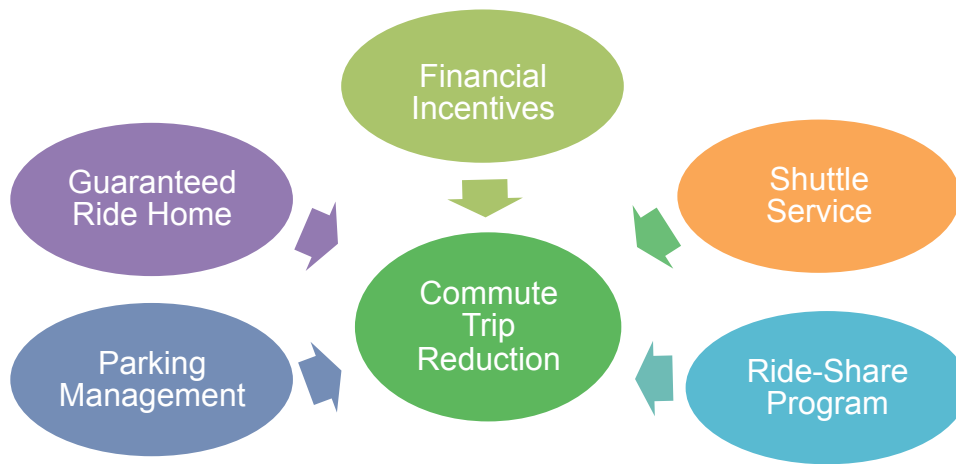


Figure 1 Commute trip reduction programs for VPD

Financial Incentives

Incentives such as parking cash-out, transit benefits, and reduced parking fees have a strong influence on commuter behaviour and can lead to significant parking demand reduction (Commute Trip Reduction, 2013). Please refer to Appendix 3 for examples of incentive programs and their corresponding savings. Overall, research has shown that 50 per cent employer-subsidized transit passes can reduce the number of people that drive alone by 20 per cent in the central business district and up to 10 per cent elsewhere (Commute Trip Reduction, 2013).

The benefits of offering incentives include (Carpool Incentive Programs: Implementing Commuter Benefits as One of the Nation's Best Workplaces for Commuters, 2005; Commuter Financial Incentives, 2014):

- Increased affordability of transportation options and equity;
- Parking cost savings for the employer and for staff.

Parking cash-out, transit and ride-share benefits, and discounted parking spots for carpoolers are three examples of incentive programs that could be considered for VPD staff.

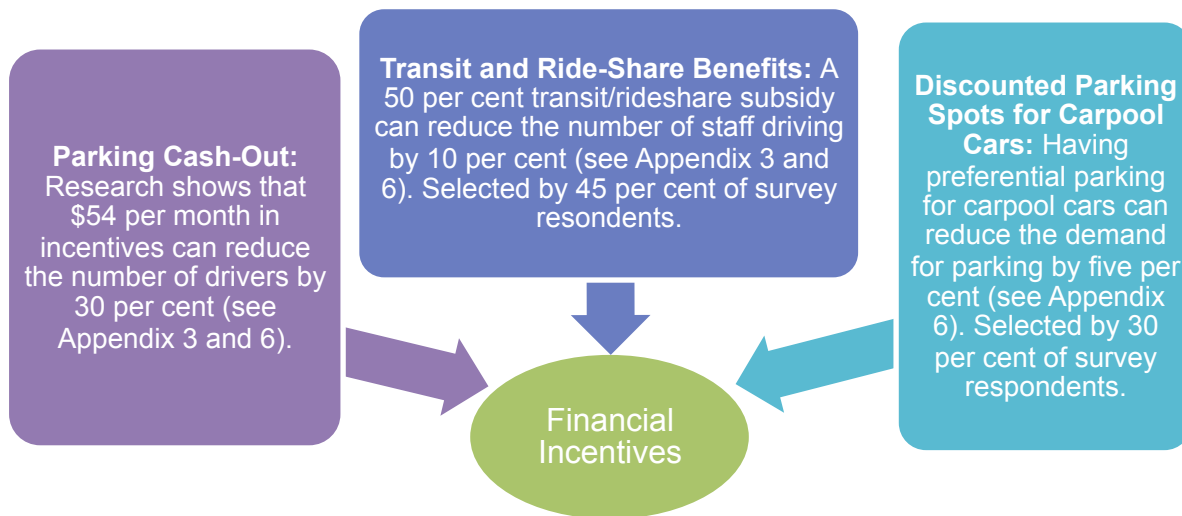


Figure 2 Financial incentives to encourage staff to not drive

Please refer to the “Social Marketing” section for more information on how to implement incentive programs.

Shuttle Services

The benefits of a shuttle system depend on the size of the organization and how often it is used. Transportation authorities operate most shuttle services. However, organizations can purchase and use their own shuttle or van. When offered at a large scale, operating a shuttle can be very expensive. However, it is possible to purchase and operate a van for this service if it is offered to the staff only. The cost of providing this service then will be only the cost of leasing and operating a van and hiring a driver who has a class four (unrestricted) driver’s licence (Commute Trip Reduction, 2013).

Projected Costs:

12 Passenger Van (lease):	\$175/Day ²
Commercial Insurance:	\$2,500/Year ³
Driver (\$26/Hour to \$33/Hour, 4 Hours/Day):	\$24,960/Year ⁴
Gas:	\$3,594/Year ⁵
Total Annual Cost:	\$94,929/Year
Cost Per Employee (based on 64 people using shuttle):	\$1,483/Year

² Yearly cost: \$63,875. Estimate obtained from Hailey Lam, Fleet Supervisor, VPD

³ Estimate obtained from Rob Rothwell, Fleet Manager, VPD

⁴ According to Hailey Lam there are fleet division staff members who can drive a 12-passenger shuttle. The pay rate for the fleet division staff is between \$26 and \$33.

⁵ This calculation is done based on the fuel efficiency of a 2012 Chevrolet van. For fuel efficiency information please see: <http://www.fueleconomy.gov/feg/noframes/31881.shtml>. Distance travelled every year is calculated based on: 8 km (VPD to Commercial Drive) x 8 times per day x 52 weeks/year x 5 days/week = 16,640 km/year. With fuel efficiency of 18L per 100 km, this van uses 2,995 litres of gas every year. Gas price used in this calculation is \$1.20.

Thirty-five per cent of survey respondents who indicated that they have considered taking transit chose a shuttle service to and from SkyTrain as a possible incentive to encourage transit use. Assuming that currently 44 people (11 per cent of staff) take transit, an additional five per cent increase in the number of people who take transit will result in 20 more people taking transit. The projected costs are based on 64 people taking the shuttle to and from the Commercial Drive SkyTrain station.

Ride-sharing

Almost 43 per cent of the staff indicated that they would like to carpool but need to find people to carpool with. Ride-sharing has a number of benefits including saving money and time for employees, reduced risk of vehicular accidents, and access to a convenient mode of transportation for those who do not drive.

Providing a ride-share website is rather inexpensive. The Jack Bell Foundation provides a website that can be used to find carpool partners. The Jack Bell Ride-Share website allows employers to create an employee-only ride-share webpage and to set guidelines and rules for staff.

Parking Pricing

According to a report prepared by the UK Department of Transport, “parking restraint is the hallmark of achieving travel plans” (Department of Transport). Charging for parking is one of the most effective ways of diverting drivers from using their cars. Below are the most important aspects of parking pricing (Shoup 2005 cited in Parking Management, 2015):

- Price parking for 100 per cent cost recovery; at a minimum, users should pay all the costs of operating parking facilities;
- Price parking at the market value and dedicate some or all of the revenue from parking to introduce demand management programs;
- Avoid having monthly passes as employees are more likely to drive if they have already paid for parking;
- Limit parking duration to help staff pay for what they use;
- Incorporate commuter cash-out incentives as a way of encouraging people to not drive.

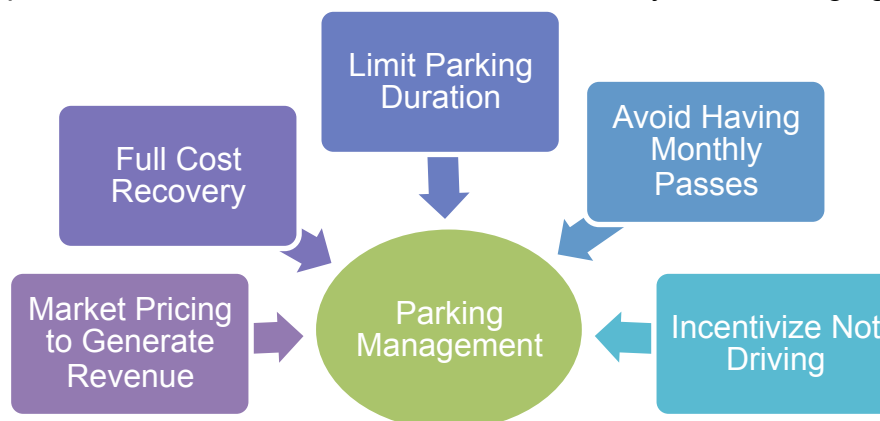


Figure 3 Parking management strategies

By charging staff for the full cost recovery, organizations can reduce their operational costs and can also help staff better understand the actual cost of parking. The revenue generated from providing parking at market pricing can be used to introduce demand management programs. Please refer to the case study of the City of Vancouver in Appendix 4.

Guaranteed Ride Home

Guaranteed ride home programs increase the reliability of carpooling and public transportation. This program is relatively inexpensive as the services are infrequently used and the program administrator can set up rules for the program. According to Commuter Transportation Services in Los Angeles, for planning purposes, one should estimate that between 0.5 and 20 per cent of current ride-share patrons would use the service. The high end of the range applies to companies that allow rides for overtime, errands, or business trips, while the low end applies to companies allowing emergency use only. Given average suburban distance taxi rates, this indicates typical costs of \$2 to \$3 annually per ride-share patron (Guaranteed Ride Home, 2014).

Steps to Create A Work Commute Plan

As the Canadian workforce is diverse, commute trip reduction programs should consider a variety of needs. Partnerships are an important aspect of delivering commute trip reduction strategies. In the Lower Mainland, TransLink's TravelSmart program supports municipalities and businesses who wish to implement commute trip reduction strategies. Hendricks and Joshi (2004 cited in Commute Trip Reduction, 2013) identified that the degree of management support and the presence of an employee transportation coordinator is important if a worksite is located outside a major business district (Commute Trip Reduction, 2013). The table below highlights some steps that can help facilitate the process of creating a work commute strategy (Department of Transport)⁶.

⁶ For more information visit <http://eu-added-value.eu/docs/makingtravelplansworklessons5783.pdf>

Steps	Next step	VPD
Build partnerships	Identify who are the stakeholders and what partnership opportunities exist. This can include local businesses, various levels of government, or transportation authority. Identify funding structure.	Stakeholders and partners: City of Vancouver, TransLink TravelSmart Program, Jack Bell Ride-Share Program, local businesses that might be interested in demand management.
Identify opportunities and barriers	Analyze the survey results and employee feedback to identify needs. Build on existing strengths.	
Encourage sustainable change	Create promotional material, create a safety net for staff members who want to make the change, encourage those who change their behaviour.	Continue the Code Green sustainability campaign. Create a social marketing campaign to highlight the benefits of carpooling and taking transit, create weeklong challenges and short pilot programs. Implement programs such as guaranteed ride home as a safety net for those who want to change their behaviour.
Gain staff ownership	Highlight achievements, role model positive behaviour, create effective channels of communication, use social media to maintain communication about the program, make the alternatives attractive (provide both carrots and sticks).	Identify leaders and champions; create a committee that encourages alternatives to driving.
Raise the profile of travel initiatives	Create events, use a single slogan or umbrella term to describe the whole program, use intranet web pages for information, reach key groups, help senior management lead by example.	Promote carpooling and taking transit through Code Green Committee, support management to lead by example.
Encourage change in culture	Enlist support of senior management and create structural change by having a program coordinator.	
Focus on results	Highlight and encourage positive change, identify the number of staff that have changed their pattern of behaviour, encourage good response, use travel surveys to identify percentage of change, set attainable targets.	

Social Marketing And Marketing Of Commute Trip Reduction Strategies

Community-based social marketing is a process by which community members are empowered to participate in creating change in their and their community's behaviour. To encourage behaviour change, organizations should first invest in structural changes that make the desired behaviour a possible and relatively easy option. The organizations then use the principles of social marketing to promote the desired behaviour (Mohr, 2012).

According to the principles of social marketing, there are seven steps in determining the right kind of program for change (Mohr, 2012): setting objectives, developing partners, getting informed, targeting the audience, choosing the tools of change, financing the program, and measuring achievement. Below are a few of the steps that can be taken to introduce a social marketing campaign.

1) Financial Incentives

According to social marketing theory, incentives are a powerful tool for encouraging and discouraging behaviours. Incentives are most effective when people will not change their behaviour without the incentive and when the incentive is enough to encourage people⁷.

Step 1: Determine the kind of incentives that will encourage behaviour change	
How Staff Choose Their Commute Mode:	Incentives identified by staff:
Convenience and cost are the two major factors determining how staff commutes to work. Incentives make the alternative behaviour more desirable.	<ul style="list-style-type: none"> ➤ Ride-share website ➤ Guaranteed ride home ➤ Discount on bus passes ➤ Discount on carpool parking ➤ Flexible start and finish times ➤ Priority carpool parking spot

Step 2: Ensure that incentives are noticeable	
Branding Encourage leaders to speak about carpooling and taking transit Have events to promote carpooling	Example: place the advertisement for parking incentives on payroll slips.

⁷ The social marketing model used here is borrowed from Tools of Change, 2015. For more information visit: <http://www.toolsofchange.com/en/planning-guide/setting-objectives/>

Step 3: Design incentives in a way that will discourage evasion	
Set rules Indicate how the programs are run Maintain communication with staff	Example: Limit on the number of rides home. For example, the City of Toronto offers a maximum of \$75 per year to each guaranteed ride home program participant.

2) Building Motivation Over Time

Step 1: Identify factors that would motivate people to take action and link the desired behaviour to the motivation		
Interest level:	Factors that motivate those who carpool and take transit include:	Link the desired behaviour to motivation
About 45 per cent of survey participants have identified interest in carpooling or taking transit to work.	<ul style="list-style-type: none"> ➤ Saving money; ➤ Lower stress and shorter commute time due to using HOV lanes; ➤ Parking is limited; ➤ Driving is expensive. 	Through promotion and marketing, help staff see how carpooling and taking transit can help them save money and have less stress.

Step 2: Acknowledge staff who demonstrates the desired behaviour
Recognize people who already carpool and take public transit: <ul style="list-style-type: none"> ➤ Publish stories in newsletters; ➤ Send a thank you letter from the chief; ➤ Encourage staff to sign up their colleagues and provide incentives.

3) Create Partnerships

Partnerships are one of the most effective ways of inducing change. In transportation demand management, collaboration with transportation authorities and participation in demand management programs such as TravelSmart, offered by TransLink, ensure access to high

quality promotional material and to well-designed websites that encourage staff to make positive changes (Developing Partners).

Overcoming Specific Barriers

Barriers are those factors that hinder behaviour change. The table below lists the barriers to carpooling identified by the focus group and survey participants and outlines possible solutions.

Barrier	How to address them	Required investment from VPD	Resolved by providing information or needs assistance	Return
People's perception of carpooling	Through creating marketing materials	Yes	Personal assistance and information	Medium
Long distances between home and work	Ride-share website	Yes	Personal assistance/website	High
Not knowing who to carpool with	Website	Yes	Information/personal assistance	High
Concern about not being able to get home on time	Create a guaranteed ride home program	Yes	Information	High
Concern about having to use personal car during the day	Make fleet available to more staff for meetings	Yes	Information	Low
Concern about how to implement carpool rules	Create guidelines	Yes	Information	Low

Conclusion

The Vancouver Police Department strives to incorporate sustainable practices in all areas of its operations. This project identified potential ways in which the staff commuting to the VPD Graveley Campus can take public transit, carpool, or cycle to work. A survey and two focus groups were held, and best practices from various cities including the Cities of Toronto, Vancouver, and Maple Ridge were analyzed. Over 170 staff members participated in the survey and focus groups. As identified in the survey, 70 per cent of the staff drive to work alone. Staff identified long commute times, lack of access to transit, and not knowing who to carpool with as top barriers that have deterred them from taking public transit, carpooling, or cycling to work.

The majority of survey respondents and focus group participants indicated that they have previously considered taking public transit, carpooling, or cycling to work. When asked what programs and incentives would encourage staff to take transit, carpool, or cycle, staff ranked the following programs and initiatives as the most helpful:

- Flexible work start and finish times;
- Guaranteed ride home;
- Employer-subsidized bus passes;
- A website to connect with other carpoolers;
- Discount on parking for carpool cars;
- A shuttle service between the Graveley Campus and the SkyTrain station;
- Priority parking spot for carpoolers.

Overall recommendations based on the literature review and the staff input include:

- Create a demand management program which could potentially include: a ride-sharing website, a guaranteed ride home program, parking pricing, financial incentives for those who take transit, carpool, and cycle, and a shuttle service between the Graveley Campus and a SkyTrain station;
- Promote alternatives to driving alone through the use of social marketing and creation of a green culture;
- Create opportunities for staff to get involved in the process of creating change through hosting bike tune-ups, competitions, and challenges that promote sustainable behaviour;
- Partner with various organizations that promote demand management programs such as TransLink and the City of Vancouver.

In closing, it is important to acknowledge that the staff who participated in this project showed a great deal of enthusiasm in adopting alternative modes of transportation. Through collaboration and consultation with staff, the VPD can continue to build on its existing achievements in greening its operations and in supporting staff to make sustainable choices.

Works Cited

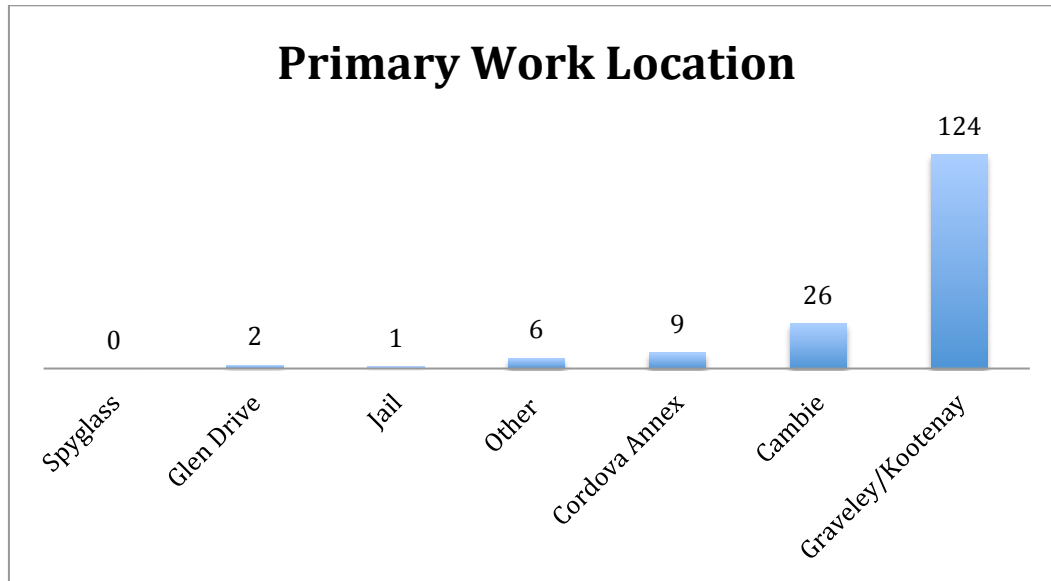
- Alternative Work Schedule*. (2010, 01 26). Retrieved 08 15, 2015, from TDM Encyclopedia: <http://www.vtpi.org/tdm/tdm15.htm>
- Carpool Incentive Programs: Implementing Commuter Benefits as One of the Nation's Best Workplaces for Commuters*. (2005). Retrieved 08 15, 2015, from Best work places : http://www.bestworkplaces.org/wp-content/uploads/2010/10/carpool_incentives_brief.pdf
- City of Toronto*. (n.d.). Retrieved 08 15, 2015, from Smart Commute a program of Metrolinx: <http://www.smartcommute.ca/toronto-central/businesses-partners/city-toronto/>
- Commute Trip Reduction*. (2013, 03 12). Retrieved 08 16, 2015, from TDM Encyclopedia: <http://www.vtpi.org/tdm/tdm9.htm>
- Commuter Financial Incentives*. (2014, 07 04). Retrieved 08 15, 2015, from TDM Encyclopedia: <http://www.vtpi.org/tdm/tdm8.htm>
- Department of Transport. (n.d.). *Making Travel Plans Work*. UK Department of Transport.
- Developing Partners*. Retrieved from Tools of Change: www.toolsofchange.com/planning-guide/developing-partners. Retrieved 09 11, 2015
- Greenest City Goals*. (2015, 06 26). Retrieved 08 15, 2015, from City of Vancouver: <http://vancouver.ca/green-vancouver/greenest-city-goals-targets.aspx>
- Guaranteed Ride Home*. (2014, 07 11). Retrieved 08 15, 2015, from TDM Encyclopedia: <http://www.vtpi.org/tdm/tdm18.htm>
- Lupick, T. (2015, 02 25). *Vancouver Coastal Health lays out "second generation" care for the Downtown Eastside*. Retrieved 07 14, 2015, from Straight: <http://www.straight.com/news/400051/vancouver-coastal-health-lays-out-second-generation-care-downtown-eastside>
- Mohr, D. M. (2012). *Introduction to Community Based Social Marketing*. Retrieved 08 16, 2015, from Tools of Change: <http://www.toolsofchange.com/en/programs/community-based-social-marketing/>
- Parking Management*. (2015, 04 17). Retrieved 08 15, 2015, from TDM Encyclopedia: <http://www.vtpi.org/tdm/tdm28.htm>
- Ridesharing*. (2015, 04 17). Retrieved 08 15, 2015, from TDM Encyclopedia: <http://www.vtpi.org/tdm/tdm34.htm>
- TDM Marketing*. (2015, 04 17). Retrieved 08 16, 2015, from TDM Encyclopedia: <http://www.vtpi.org/tdm/tdm23.htm>
- Turcotte, M. (2011). *Commuting to Work: Results of the 2010 General Social Survey*. Statistics Canada. Ottawa: Statistics Canada.
- US Dept. of Environmental Protection. (2005). *Parking Cash Out: Implementing Commuter Benefits as One of the Nation's Best Workplaces for Commuters*. Retrieved from http://www.bestworkplaces.org/pdf/ParkingCashout_07.pdf
- Vancouver is Becoming the Greenest City Inside and Out*. (2015, 06 22). Retrieved 08 15, 2015, from City of Vancouver : <http://vancouver.ca/green-vancouver/how-we-are-greening-city-operations.aspx>
- Vancouver Police Department. (2012). *Vancouver Police Department Strategic Plan*. Strategic Plan, Vancouver Police Department, Vancouver.
- Work Place Program Impact Report*. (2015). Retrieved 07 16, 2015, from Smart Commute: <http://smartcommute.ca/wp-content/uploads/2014/07/Smart-Commute-Workplace-Impact-Report-EN.pdf>

Appendix 1: Survey Results

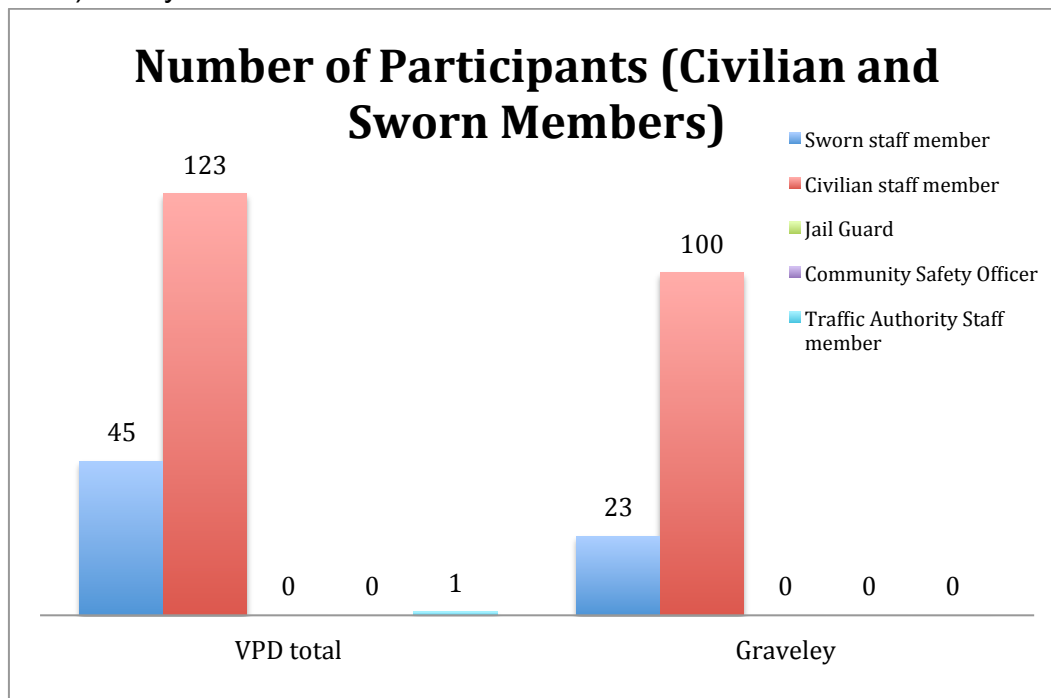
Survey Results

Below is a list of survey questions and a graphical representation of the answers that were provided by the participants (total number of respondents to various questions varies).

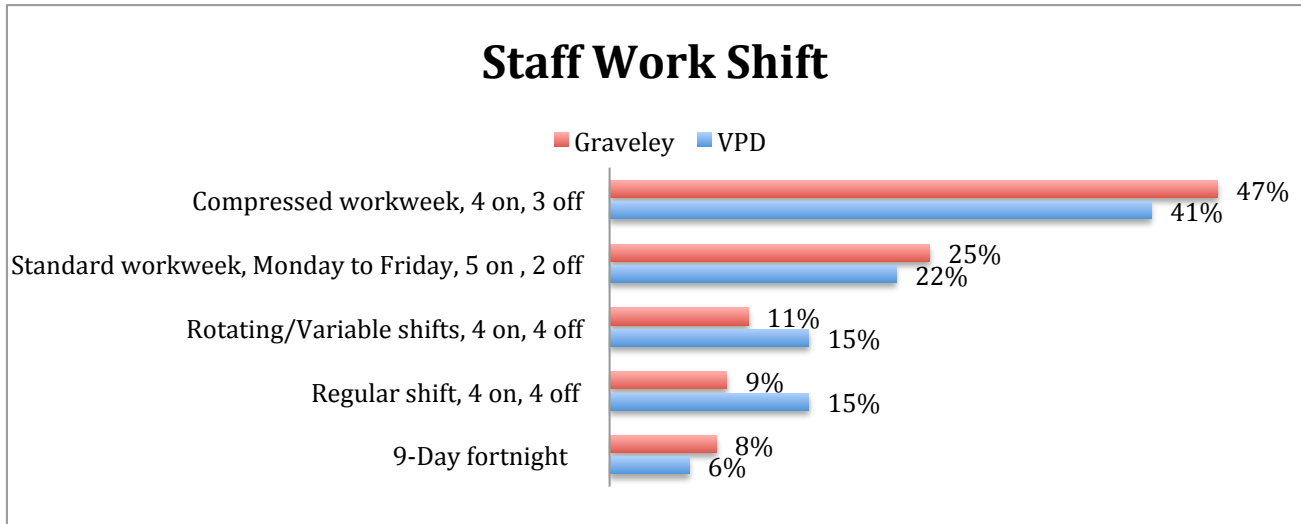
1) Which is your primary worksite:



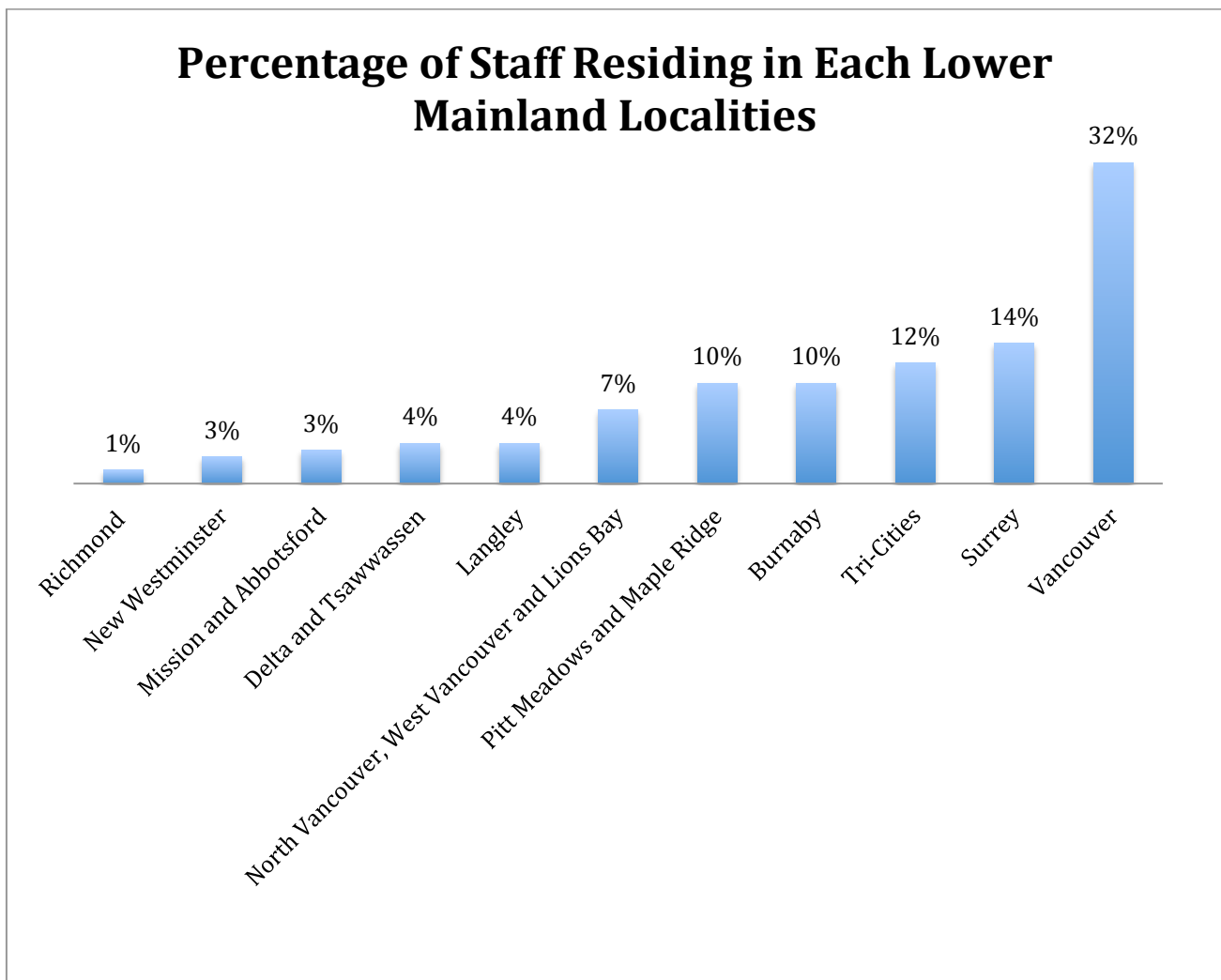
2) Are you a:



3) Select your usual work shift:



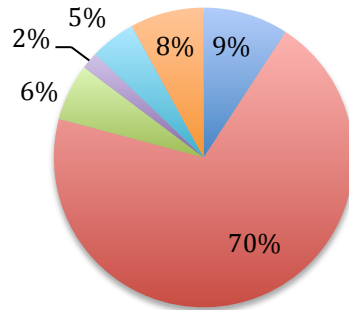
4) Locality in which you reside:



5) How do you usually commute to work:

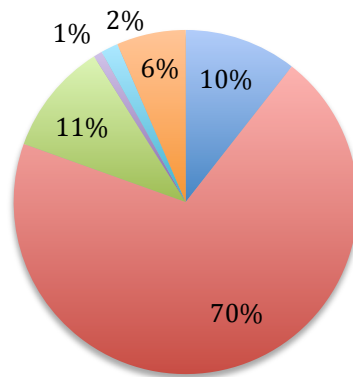
How Staff Commute (All VPD Participants)

Public transit Drive alone Carpool Walk Bike Other or combinations

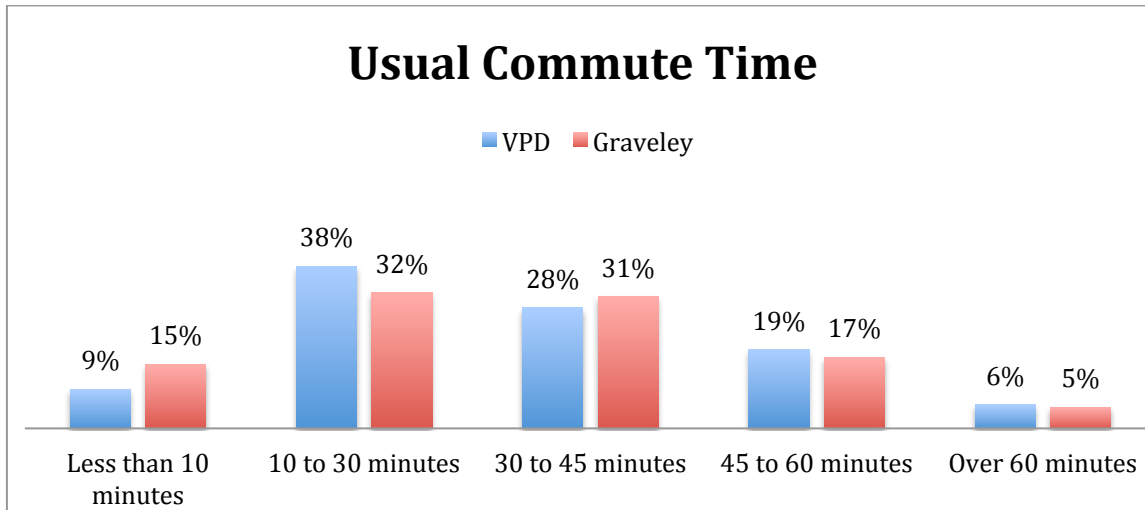


How Staff Commute (Graveley Campus Participants)

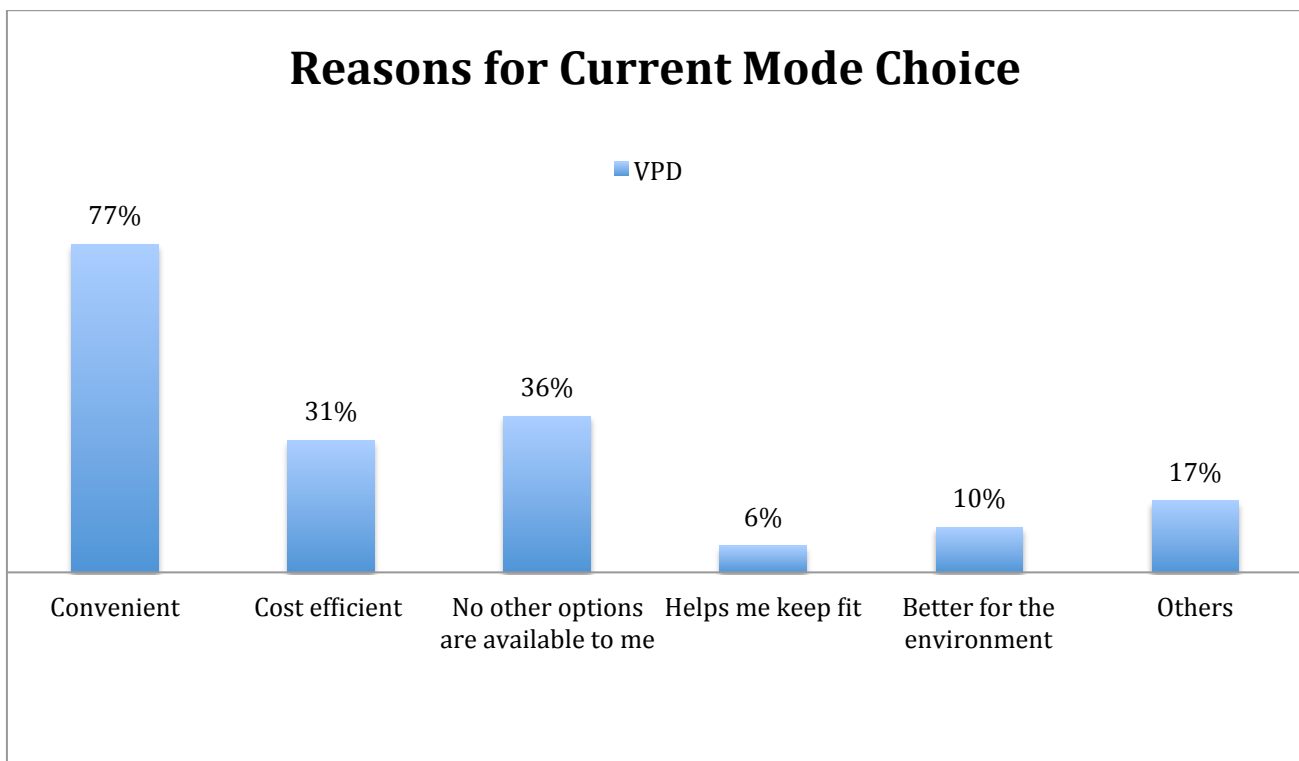
Public transit Drive alone Carpool Walk Bike Other or combinations



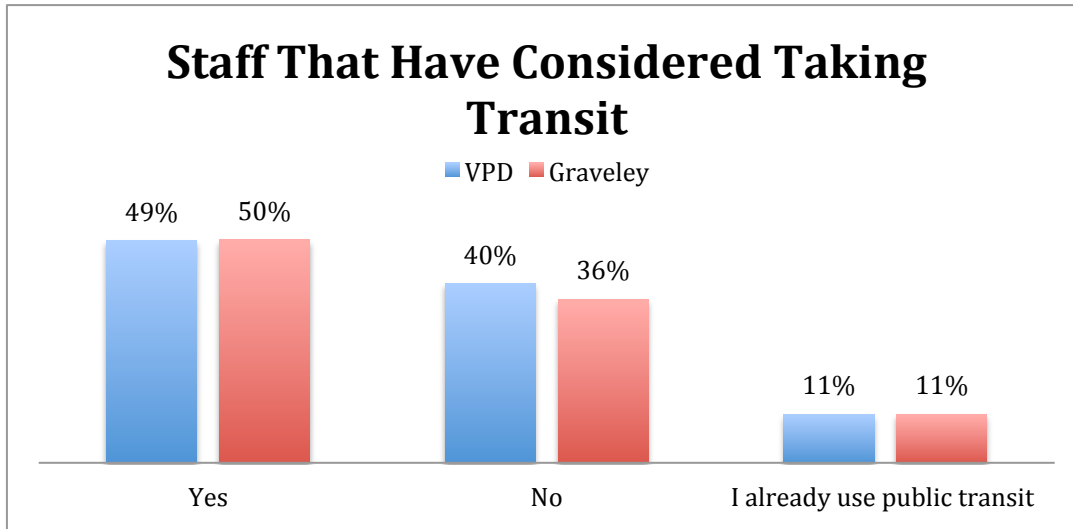
6) Thinking of your usual commute method, how long does it take to get to work:



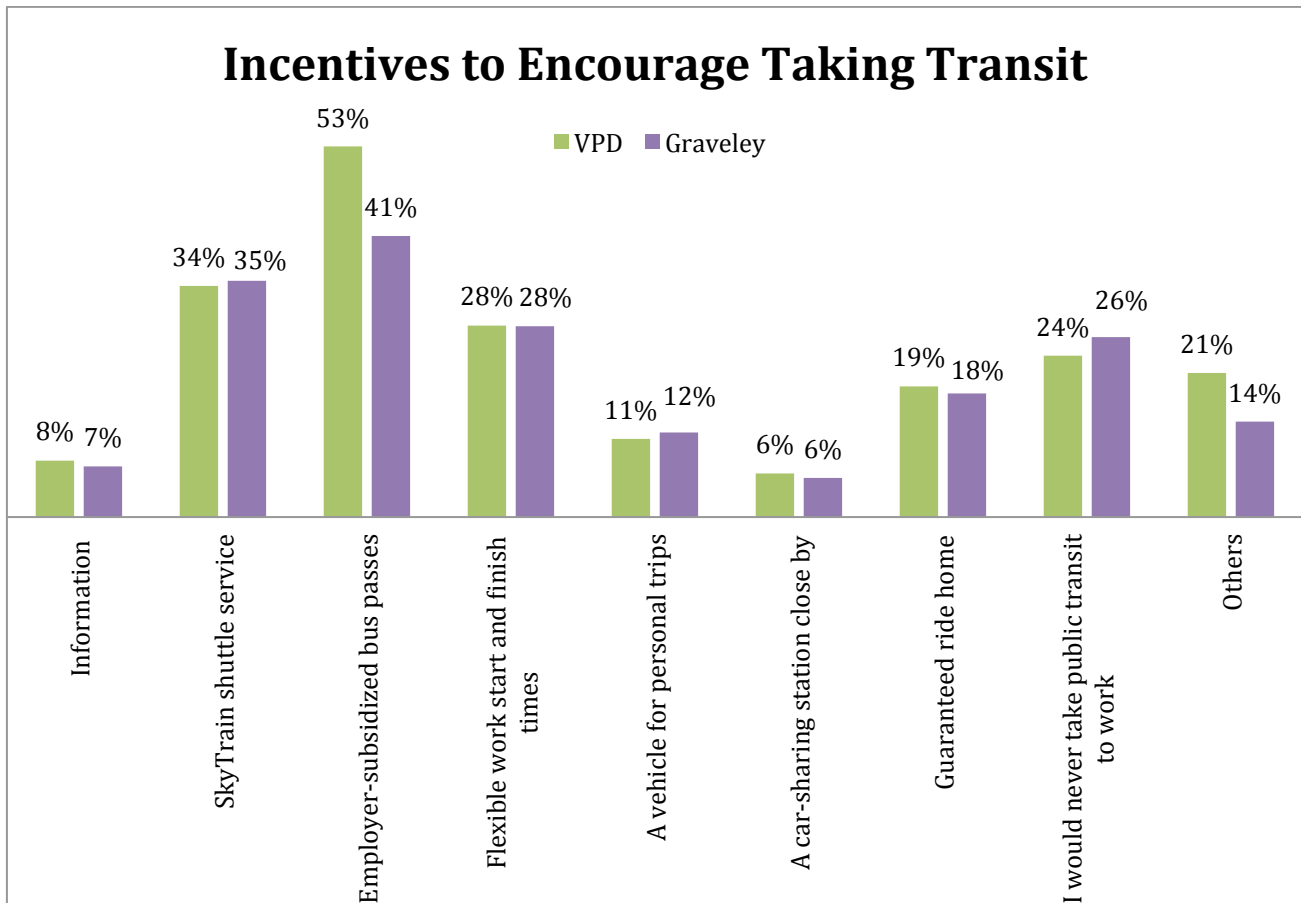
7) Which factors influence your usual mode of transport to work:



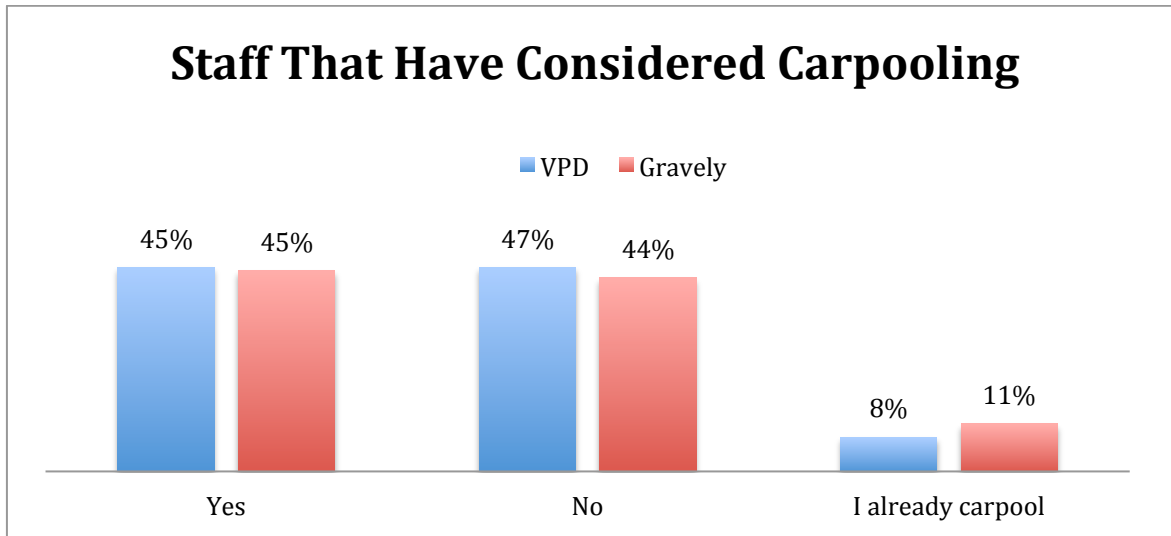
8) Have you considered taking public transit to work:



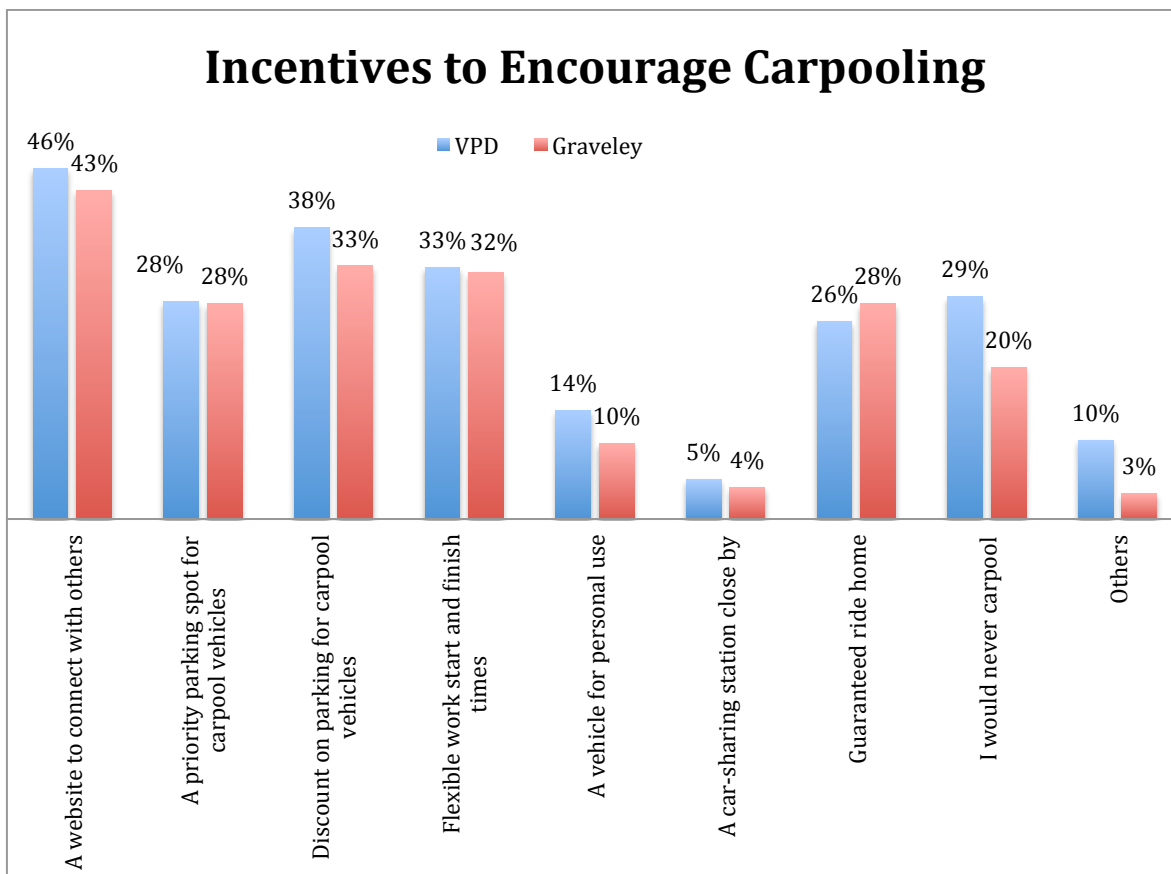
9) What kind of incentives and support would encourage you to take public transit to work:



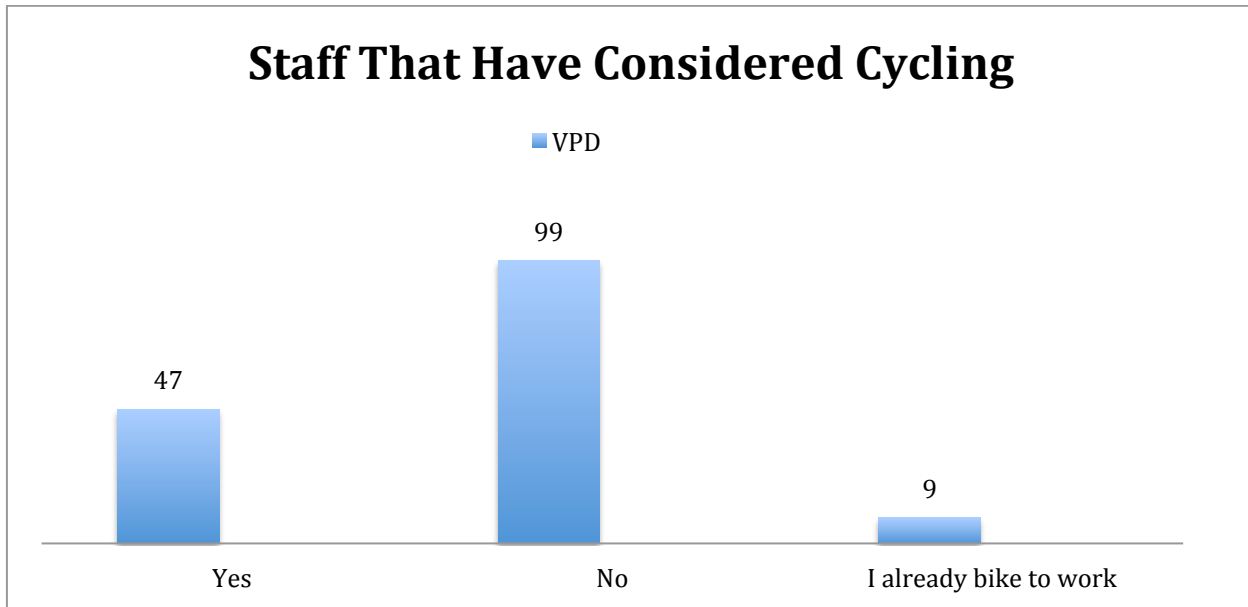
10) Have you considered carpooling to work:



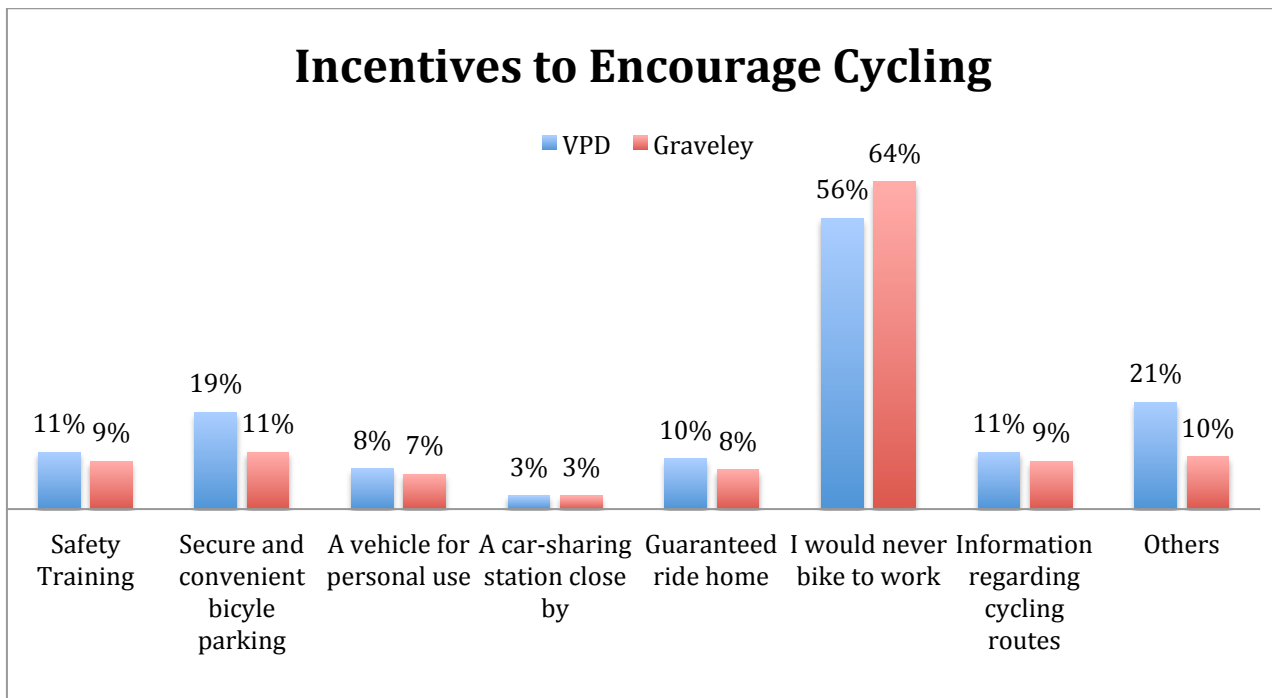
11) What kind of incentives and support would encourage you to carpool to work:



12) Have you considered biking to work:



13) What kind of incentives and support would encourage you to bike to work:



Appendix 2: List of Useful Websites

List of websites that can be used for reference

Sample of Trip Reduction Plan	http://www.deq.state.or.us/nwr/eco/docs/SamplePlan.pdf http://www.bestworkplaces.org/bwc-employer-spotlight/space-coast-area-transit/
Carpooling	Carpooling Hints www.CarpoolTool.com http://www.bestworkplaces.org http://www.transport.wa.gov.au/mediaFiles/active-transport/AT_TS_P_Car_Pooling_Toolkit.pdf
Parking	Parking Today www.parkingtoday.com) Parking Network www.parking-net.com Parking Reform website www.parkingreform.org Parking Cash out: http://www.bestworkplaces.org/pdf/ParkingCashout_07.pdf
Alternative Behaviour	Behaviour change http://www.cbsm.com/forums/index.lasso http://www.toolsofchange.com/en/planning-guide/setting-objectives/ https://explore.smartcommute.ca/#/ Commuter Challenge Program www.CommuterChallenge.org http://www.commuterchoice.com/index.php?page=employers&sub=employers_guidance http://www.cutr.usf.edu/2015/01/cutr-assists-aashto-complete-series-of-reports-tracking-commuter-trends-and-behavior/ http://www.ops.fhwa.dot.gov/PrimerDSS/implementation/implement_1.htm
Guaranteed Ride Home	http://www.nctr.usf.edu/clearinghouse/grhfund.htm

Appendix 3: Description of Various Commute Trip Reduction Programs

Program	Definition	Examples
Commuter Financial Incentives (Parking Cash-out or Transit Allowances)	<p>Refers to various ways in which employees can gain from changing their mode of transportation. There are various types of incentives that can be offered to employees. Most commonly used incentives include:</p> <ul style="list-style-type: none"> ➤ <i>Parking Cash-out:</i> Commuters who are offered subsidized parking are offered the cash equivalent if they choose not to bring their car (Shoup, 2005). This payment can be a Travel Allowance (it can only be used for commuting). ➤ <i>Transit and ride-share benefits:</i> Commuters who choose to commute with public transit instead of driving are provided with discounted or free transit passes. 	<p>In 2006 the Vancouver Airport began to offer a \$50 monthly rebate to staff not driving alone to work. Within five months 17% of employees were participating⁸. The Alameda County Congestion Management Program enlisted four employers to provide financial incentives to encourage reduced driving. Financial incentives alone reduced automobile commute trips by 16-20% and significantly more if combined with other TDM strategies (Commuter Financial Incentives, 2014)</p>
Ride-share Matching	<p>This includes multiple employees sharing a car. Because of the cost associated with ride-share matching, it is best if a service is provided to the whole region. Ride-share programs have the lowest operation cost and have the lowest cost per person (Ridesharing, 2015). Ride-sharing is often the most effective way of commuting. To encourage ride-sharing, employers can offer preferred parking spaces and subsidize vanpooling costs.</p> <p><i>Vanpooling:</i> Commuters use a rented van instead of their personal cars and the operating cost is divided between the employees.</p>	See Appendix 4 for examples.

⁸ Donald Shoup (2005), *Parking Cash Out*, Report 532, Planning Advisory Service (www.planning.org/pas), American Planning Association.

Program	Definition	Examples
Alternative Scheduling (Flex Time or Compressed Workweek)	Alternative scheduling includes: Flex time, compressed workweek, and staggered shifts. Compressed workweek is the most effective commute reduction strategy ⁹ . Some researchers suggest that having flexible work time contributes to being able to participate in ride-share programs (Alternative work Schedule, 2010).	In Edmonton a compressed workweek is one of several options available to city employees to reduce vehicle kilometres traveled (VKT). The City of Winnipeg has also implemented flexible work arrangements ¹⁰ .
Transportation Demand Management (TDM) Marketing and Promotion	Marketing and promotion has a substantial influence on people. TDM marketing involves determining consumer needs and preferences and creating a dialogue with the consumers about fulfilling their needs. This includes delivering different messages to different people based on their needs and setting realistic goals for people (TDM Marketing, 2015).	The Ottawa-Carleton Region has established a one-stop, online source for complete information about walking, cycling, carpooling, and public transit called TravelWise, www.rmoc.on.ca/travelwise . "TravelWise at Work" section provides comprehensive information about various work commute trip reduction programs (TDM Marketing, 2015).
Guaranteed Ride Home	Guaranteed ride home programs provide occasional subsidized rides to commuters who use alternative modes of transportation. The cost of offering this service tends to be low because it is seldom that people actually need the service. Before starting a guaranteed ride home program, it should be decided who is eligible and what kind of trips are covered. Guaranteed rides can increase the likelihood of commuters taking transit. Hunt and McMillan (1998) found that guaranteed ride home programs have the same influence as providing bus subsidies ¹¹ for a fraction of the price (Guaranteed Ride Home, 2014).	Case study examples: Cities of Vancouver and Toronto. Commuter Transportation Services in Los Angeles suggests that guaranteed ride home programs influence mode change between 0.5 and 20 per cent. The variance is based on what kinds of trips are covered. This comes to about \$2 - \$3 per ride-share participant in Los Angeles (Guaranteed Ride Home, 2014). In a study of 50 guaranteed ride home programs; it was found that "the average cost per claim, in this survey, was \$36.95, with a median cost of \$29.96 and a range of no cost to \$114.08 (Menczer, 2007, p. 137). The average cost per person tends to be around \$1.69. On average only 4.57 per cent of people used the program" (Menczer, 2007, p. 144).

⁹ Rosella Picado (2000), "A Question of Timing," *Access 17*, fall 2000, pp. 9-13.

¹⁰ www.tc.gc.ca/envaffairs/subgroups1/passenger_urban/study1/FinalAppendices/appendix_e.htm
Rosella Picado (2000), "A Question of Timing," *Access 17*, fall 2000, pp. 9-13.

¹¹ John D. Hunt and JDP McMillan (1998), *A Stated Preference Examination of Attitudes Towards Carpooling to Work in Calgary*, Transportation Research Board Annual Meeting (www.trb.org).

Program	Definition	Examples
Walking and Cycling Encouragement and Incentives	<p>Walking and cycling encouragement and incentives refers to programs and activities that encourage staff to walk and use their bikes. This includes:</p> <ul style="list-style-type: none"> ➤ Educational programs that promote cycling; ➤ Reimbursement for bike mileage; ➤ Providing way-finding and other tools to assist bikers. 	<p>Participating in Bike to Work Week. According to Tight and Page (2007), an integrated program that includes incentives for biking can increase biking rates by up to 20 per cent, half of which comes from vehicle commuters¹².</p>
Transit Encouragement	<p>Transit encouragement strategies refer to programs that make taking transit a more pleasant option by offering incentives and discounts to transit users. This includes helping staff see how taking transit can help them relax and providing incentives to those who use transit.</p>	<p>The University of Bristol in partnership with a neighbouring health trust runs a free staff bus between the station and the hospital. More than five per cent of university employees commute this way some or all of the time (Commute Trip Reduction, 2013).</p>
Company Vehicle	<p>Allow staff to use company fleet for meetings and running errands to help reduce dependency on cars during workday.</p>	<p>See City of Vancouver example in Appendix 4.</p>

¹² Mark Wardman, Miles Tight and Matthew Page (2007), "Factors Influencing The Propensity To Cycle To Work," *Transportation Research*, Vol. 41, Issue 4 (www.elsevier.com/locate/tra), pp. 339-350; at <http://eprints.whiterose.ac.uk/2448/1>.

Works Cited

- Alternative work Schedule* . (2010, 01 26). Retrieved 08 15, 2015, from TDM Encyclopedia: <http://www.vtpi.org/tdm/tdm15.htm>
- Carpool Incentive Programs: Implementing Commuter Benefits as One of the Nation's Best Workplaces for Commuters*. (2005). Retrieved 08 15, 2015, from Best work places : http://www.bestworkplaces.org/wp-content/uploads/2010/10/carpool_incentives_brief.pdf
- City of Toronto*. (n.d.). Retrieved 08 15, 2015, from Smart Commute a program of Metrolinx: <http://www.smartcommute.ca/toronto-central/businesses-partners/city-toronto/>
- Commute Trip Reduction*. (2013, 03 12). Retrieved 08 16, 2015, from TDM Encyclopedia: <http://www.vtpi.org/tdm/tdm9.htm>
- Commuter Financial Incentives*. (2014, 07 04). Retrieved 08 15, 2015, from TDM Encyclopedia: <http://www.vtpi.org/tdm/tdm8.htm>
- Department of Transport. (n.d.). *Making Travel Plans Work*. UK Department of Transport.
- Guaranteed Ride Home*. (2014, 07 11). Retrieved 08 15, 2015, from TDM Encyclopedia: <http://www.vtpi.org/tdm/tdm18.htm>
- Menczer, W. (2007). Gauranteed Ride Home Programs: A study of Program characteristics Utilization and Cost. *Public Transportation*, 10, 131-145.
- Parking Management*. (2015, 04 17). Retrieved 08 15, 2015, from TDM Encyclopedia: <http://www.vtpi.org/tdm/tdm28.htm>
- Ridesharing*. (2015, 04 17). Retrieved 08 15, 2015, from TDM Encyclopedia: <http://www.vtpi.org/tdm/tdm34.htm>
- TDM Marketing*. (2015, 04 17). Retrieved 08 16, 2015, from TDM Encyclopedia: <http://www.vtpi.org/tdm/tdm23.htm>
- US Dept. of Environmental Protection. (2005). *Parking Cash Out: Implementing Commuter Benefits as One of the Nation's Best Workplaces for Commuters*. Retrieved from http://www.bestworkplaces.org/pdf/ParkingCashout_07.pdf

Appendix 4: Case Studies

The purpose of these case studies is to provide information about how various localities and organizations have implemented work commute trip reduction programs.

City of Toronto:

Program Structure: The City of Toronto, in partnership with the Smart Commute program, has developed a comprehensive Work Commute Trip Reduction Program.

Strategies used: promoting cycling, guaranteed ride home, ride-share, and promoting public transit. The City of Toronto staff was contacted for more information; however, they were not available for an interview. This information is taken from the City of Toronto's website (City of Toronto):

Programs

- 1) Active Transportation
 - a. Active Switch:
 - i. The Active Switch allows users to set goals and converts the distance travelled into greenhouse gas emissions saved and calories burned.
 - ii. Can be accessed at ActiveSwitch.ca/Workplaceto.
 - b. Bike Share Toronto Memberships: Staff can register for a Live Green Membership Card to receive a \$15 discount on a one year Bike Share Toronto Membership.
 - c. Bike Tune-Up Clinics: Employees can book bike tune-up clinics through Smart Commute all year round.
 - d. Cycling Safety Workshops: Participants receive helpful tips ranging from traffic rules and laws, proper signalling while riding, to correct road positioning in dynamic scenarios.
 - e. Onsite Cycling Facilities at Civic Centres: Cycling-supportive amenities are provided at various work locations.
- 2) Automobile
 - a. Carpool Match: Online ride-matching tool is provided through Smart Commute's website.
 - i. The Smart Commute online tool also helps estimate the travel costs associated with the carpool car – to be shared amongst carpoolers.
 - ii. Smart Commute offers prizes and various campaigns to encourage carpooling.
- 3) Public Transit
 - a. Discounted TTC VIP Metropass: City Employees Save 12 per cent on monthly TTC Metropass.
- 4) Emergency
 - a. Emergency Ride Home (ERH) Program: this program offers City of Toronto employees who commute to work in a sustainable way a free ride home in the event of a personal emergency.
- 5) Smart Commute Online Tool
 - a. Online Tool: Smart Commute provides a range of online tools that help staff find a carpool match, track trips and assess the financial and environmental costs of various commute choices.

- b. Smart Commute hosts programs and competitions and allows the staff to compete with their fellow residents and employees in the Greater Toronto and Hamilton Area.
- c. Staff can join the “City of Toronto – Staff” network on the online tool.

For more information please contact Smart Commute at 416-392-6064 or email scommute@toronto.ca.

A summary of City of Toronto’s baseline survey is available on request. Please email scommute@toronto.ca. See more at <http://www.smartcommute.ca/toronto-central/businesses-partners/city-toronto/>

Hatch Ltd.

Hatch Ltd. joined Smart Commute as an alternative to parking lot expansion.

Strategy used: Incentive (Work Place Program Impact Report, 2015, p. 7).

1) Incentives offered:

- a. Through an internal tracking system, which is linked to their payroll system, Hatch Ltd. gives staff a financial incentive for every carpool passenger driven or cycling trip recorded.
- b. Priority carpool parking spaces at each of their offices in the region. The participants have to display a carpool parking tag on their vehicle and register with HR.
- c. New-hire packages and a telework program were also introduced to incentivize not driving.

Hatch’s success rate:

- Thirteen per cent increase of staff carpooling per day, bringing the total to 23 per cent (115 staff members);
- Capital and operating cost savings for 65 to 70 parking spaces;
- An average of 120 staff cycling trips per month;
- Twenty-two per cent increase in employee commute satisfaction.

City of Vancouver

The City of Vancouver has a Sustainable Commute Program with full-time staff dedicated to receiving and processing all parking requests. The Sustainable Commute Program was designed by City of Vancouver staff, and the program is maintained through fees collected from employees who park at the City Hall Campus.

Strategies used: incentives, parking management, encouraging biking, encouraging transit, providing ride-share support, and guaranteed ride home availability.

Initiatives taken by the City of Vancouver:

1) Parking Management

Market-rate parking is applied for all City staff. Most City staff pays for parking on a daily basis.

Lot	Parking fees	Type of parking
Cambie parkade	\$6/day \$120/month	Daily, some monthly reserved
West Annex (formerly the Vancity Building)	\$120/month	Monthly reserved
10th Avenue surface lot	\$120/month	Some monthly reserved
Spyglass Place	\$4/day \$80/month	Daily, some monthly reserved
Crossroads	\$140/month	Monthly reserved - only for staff working at Crossroads

1) Encouraging Carpooling:

- a. A safe-walk program is offered to staff that commute to City Hall Campus if they feel uncomfortable walking to their cars alone.
- b. Cars registered in the ride-share program are eligible for a parking discount.
- c. There are both Co-op and City Fleet vehicles available for staff to use during the day, and employees do not need to bring their cars to work during the week for work meetings or running errands.
- d. Employees who participate in the carpool program can take a fleet car home. The cost of using a fleet car for carpooling is an automatic payroll deduction (45 employees use this program).

2) Incentives for not driving:

- a. Fare Savers and discount on transit passes;
- b. Gift Certification: rewarding employees for walking or cycling;
- c. Discounted parking for ride-share cars;
- d. Discount on car-share program;
 - i. Employees can join Modo at a discounted rate for both work and personal use.

3) Encouraging biking:

- a. Lockers, showers, and secure biking.

4) Guaranteed Ride Home:

- a. Eligibility: all city employees who commute to work via transit, cycling/walking or other active mode, or ride-sharing (carpooling) and need a quick way home in the event of the following:
 - i. Personal or family illness or emergency;
 - ii. Approved, unscheduled overtime (manager approval required);
 - iii. If left stranded because the driver of the carpool car had to leave or stay overtime;
 - iv. Each employee can access this up to three times in a year.
- b. Travel Options:
 - i. Taxi voucher;
 - ii. Getting reimbursed for a taxi trip;
 - iii. Getting reimbursed for a transit trip or a combination of transit and taxi.

- 5) Ride-Sharing:
- a. City hall employees who carpool to work can get a discount on parking and priority parking spots.
 - b. Employees are required to register with the Jack Bell Ride-Share database using a valid City of Vancouver email.
 - c. Each eligible employee in a registered ride-share will receive a discount equivalent to 20 per cent of the total monthly cost of a reserved parking stall. This discount will be applied to their portion of the monthly parking fee. A ride-share with five or more participants will get reserved parking free of charge.
 - d. There are also a number of city fleet and car-share vehicles that staff can use for car-share.

Internet Access: <http://citywire.city.vancouver.bc.ca/scp/index.htm>

For operational questions contact Vania Tse, Sustainable Commuting Program Administrator, at 604-871-6247 or Sue Goddard at 604-871-6178.

Other Organizations

The City of Maple Ridge

Strategies used: Incentives, ride-share program

The city of Maple Ridge provides an internal website which staff can use to find ride-share partners. The staff that uses the ride-share program gets a discount on parking fees. However, parking is very inexpensive, and this may not act as an incentive for staff.

E-Comm 911 at Still Creek Site

Strategy used: encouraging public transit by providing free shuttle.

The property management company provides a free shuttle to Brentwood Mall and Gilmore SkyTrain Station for employees commuting to the Willingdon business centre. The shuttle runs frequently during rush hours and lunchtime. According to the facilities manager for E-comm 911, about 20 staff members use public transit as a result of this initiative. This shuttle is free for whoever gets on, and no identification is required. According to JoAnn Woodhall, Demand Management Specialist at TransLink, providing this service requires a special licence. Providing a shuttle for VPD employees only may not require the same licensing process. This is similar to how South Vancouver Neighbourhood House operates seven minivans to pick up seniors and children for various programs. According to the office manager at South Vancouver Neighbourhood House, Roberta Klockow Kihn, the only requirement for using the vans for internal use is that the driver has a class four driver's licence.

Intrawest Corp.

Strategies used: Carpooling and Parking Cost Savings (US Dept. of Environmental Protection, 2005).

Company: Intrawest Corp.

Location: Surrey, BC.

Number of Employees: 700

Situation: Owned the parking lot and wanted the land for other uses;

Close to public transit (SkyTrain);

Cost per car spot (value of land lost when used for parking): \$11,000;

Strategy: Trip Reduction Program.

The company took the following actions:

- Encouraged carpooling by giving employees preferential parking rates for cars that had pool riders;
- Set up a ride-matching service to encourage carpooling;
- Offered incentives for reducing trips such as fitness memberships, ski passes, and car rentals.

Results:

- Cut parking spots by 50 at \$11,000 for each spot;
- Realized savings of \$550,000.

Works Cited

City of Toronto. (n.d.). Retrieved 08 15, 2015, from Smart Commute a program of Metrolinx: <http://www.smartcommute.ca/toronto-central/businesses-partners/city-toronto/>

US Dept. of Environmental Protection. (2005). *Parking Cash Out: Implementing Commuter Benefits as One of the Nation's Best Workplaces for Commuters*. Retrieved from http://www.bestworkplaces.org/pdf/ParkingCashout_07.pdf

Work Place Program Impact Report. (2015). Retrieved 07 16, 2015, from Smart Commute: <http://smartcommute.ca/wp-content/uploads/2014/07/Smart-Commute-Workplace-Impact-Report-EN.pdf>

Appendix 5: Resource Document: Negative Health Outcomes of Commute

Work Commute and Negative Health Outcomes

Considering the high number of regular drivers, most commuters are impacted by congestion. Twenty per cent of drivers in Metro Vancouver experience congestion every day, and 67 per cent of car users encounter congestion at least one day of the week (Turcotte, 2011, p. 33). In general, a longer commute to work is associated with higher stress and less satisfaction with work-life balance. According to the 2010 General Social Survey, 38 per cent of workers who are caught in congestion three or more times per week report feeling extremely stressed (p. 34). In all instances, an increase in commuting frequency is associated with higher stress (p. 33).

Over 60 per cent of commuters who use their personal cars have reported being stuck in traffic at least once a week. This trend is highly problematic as it is now widely understood that ozone, other particles, and carbon dioxide levels are directly linked with auto-pollution (Currie et al., 2009) and that emissions from cars are directly linked with serious public health issues such as asthma and heart disease. This is partially because “toxins are in their highest concentrations along roadways and intersections than anywhere else in a typical city” (Clean Air Hamilton 2008 cited in Topalovic et al., 2012, p. 337), and drivers who are caught in traffic breathe in more polluted air than cyclists who cycle along the road (Boogaard, Borgman, Kamminga, & Hoek, 2009).

In Metro Vancouver, the average commuter spends over a year of his or her life driving in traffic, in most cases at a very slow speed (Arnold, 2014). In such scenarios, individuals are not only vulnerable to the health problems mentioned above, but may suffer from a synergistic influence of ozone and other pollutants such as black carbon and nitrogen dioxide (Mauderly and Samet 2009 cited in Giles et al., 2011, p. 31). Synergy between pollutants means that these pollutants may cause “a greater additive effect on lung function, cytokine production, and cardiac output and stroke volume compared with the individual pollutants themselves” (Mauderly and Samet 2009 cited in Giles et al., 2011, p. 31).

Commuters in Metro Vancouver are particularly at risk of getting sick from congestion. In 2012, one quarter of Metro Vancouver residents reported that they are usually stuck in traffic every day. As the population of Metro Vancouver grows, congestion and emission levels will increase accordingly. Considering the rapid growth of this region, TransLink expects that the number of severe congestions will experience a 120-fold increase by 2021 (Metro Vancouver, 2009 cited in Arnold, 2014, p. 28). This will result in prolonged commute times in low speed traffic, which increases stress and causes serious health problems.

Works Cited

- Arnold, J. (2013, October 14). Congested and Nowhere to Go: Road Congestion, British Columbia Ministry of Environment. (2014). British Columbia Greenhouse Gas Inventory Report 2012.
- Boogaard a, H., Borgman, F., Kamminga, J., & Hoek, G. (2009). Exposure to ultrafine and fine particles and noise during cycling and driving in 11 Dutch cities. *Atmospheric Environment*, 43 Retrieved from http://ac.els-cdn.com/S1352231009004506/1-s2.0-S1352231009004506-main.pdf?_tid=03035486-afc5-11e4-82e5-00000aab0f6b&acdnat=1423422322_e5ad49dd8baf9d5a14d8de0b274_d094d
- Currie, J., Neidell, M., & Schmieder, J. F. (2009). Air pollution and infant health: Lessons from New Jersey. *Journal of Health Economics*, 28(3), 688-703. doi:10.1016/j.jhealeco. 2009.02.001
- Giles, L. V., Barn, P., Künzli, N., Romieu, I., Mittleman, M. A., van Eeden, S., Brauer, M. (2011). From good intentions to proven interventions: Effectiveness of actions to reduce the health impacts of air pollution. *Environmental Health Perspectives*, 119(1), 29-36. Retrieved from <http://web.b.ebscohost.com.ezproxy.library.ubc.ca/ehost/detail/detail?sid=67cf8818-fe0a-46da-be91-05a6636d4301%40sessionmgr112&vid=0&hid=110&bdata=JnNpdGU9ZWZWhvc3.QtbGl2ZSZZY29wZT1zaXRl#db=mnh&AN=20729178>
- Topalovic, Carter, Topalovic, & Krantzberg. (2012). Light rail transit in Hamilton: Health, environmental and economic impact analysis Social Indicators Research, 108(2), 329-350. Retrieved from <http://link.springer.com/10.1007/s11205-012-0069-xhttp://www.springerlink.com/index/pdf/10.1007/s11205-012-0069-x>
- Turcotte, M. (2011). *Commuting to Work: Results of the 2010 General Social Survey*. Statistics Canada. Ottawa: Statistics Canada.

Appendix 6: Commute Trip Reduction Tables

The table below illustrates the relationship between providing financial incentives and decreased parking demand (Commute Trip Reduction, 2013).

Location	Scope	Employees Affected	Financial Incentive (\$/month based on 1995 figures)	Decreased Parking Demand
Group A: Areas With Little or No Public Transportation				
Century City District, West Los Angeles	3,500 employees surveyed at 100+ firms	3,500	\$81	15%
Cornell University Ithaca, NY	9,000 faculty & staff	9,000	\$34	26%
San Fernando Valley, Los Angeles	1 large employer (850 employees)	850	\$37	30%
Bellevue, WA	1 medium-sized firm (430 employees)	430	\$54	39%
<i>Group Totals and Weighted Averages</i>		13,780	\$47	24%

Table 1: *Note.* Financial cost of various CTR programs, printed from "Financial Incentives", TDM Encyclopaedia, Victoria Transport Policy Institute.

The table below summarize the effectiveness of each of the demand management strategies (Ridesharing, 2015). Though the reference is over 20 years old, the trend still seems to be the same (Commute Trip Reduction, 2013).

Sacramento Trip Reductions Credits from TDM Strategies (Ewing 1993)

TDM Strategy	CBD	Within 660ft of Transit Station	Elsewhere
Rideshare Vehicle Preferential Parking	10%	5%	5%
100% Transit/Rideshare Subsidy	35%	25%	10%
50% Transit/Rideshare Subsidy	20%	15%	10%
Vanpool Program	10%	10%	10%
Worksite Showers and Lockers	5%	2%	2%
Guaranteed Ride Home	2%	2%	2%
Onsite Childcare	5%	5%	5%

Table 2: *Note.* Sacramento Trip Reductions Credits from TDM Strategies, printed from "Commute Trip Reduction", TDM Encyclopaedia, Victoria Transport Policy Institute. (Copy right, Ewing 1993)

Works Cited

Commute Trip Reduction. (2013, 03 12). Retrieved 08 16, 2015 from TDM Encyclopaedia: <http://www.vtpi.org/tdm/tdm9.htm>

Commuter Financial Incentives. (2014, 07 04). Retrieved 08 15, 2015 from TDM Encyclopaedia: <http://www.vtpi.org/tdm/tdm8.htm>

Parking Management. (2015, 04 17). Retrieved 08 15, 2015 from TDM Encyclopaedia: <http://www.vtpi.org/tdm/tdm28.htm>