

**DRIVING MAD: PUBLIC PERCEPTIONS OF ROAD
PRICING AND THE COSTS OF CONGESTION IN METRO
VANCOUVER**

by

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Abstract

Traffic congestion in Metro Vancouver is a widely acknowledged problem, but its true cost to society is not. The effectiveness of road pricing to reduce congestion has been demonstrated around the world. Why then if the benefits are so clear is the Metro Vancouver public opposed to road pricing? Through in-depth interviews, this study examines public perceptions of the costs of congestion and barriers to understanding the objectives of road pricing.

The study found that drivers' misperceptions about the costs of congestion and road pricing are linked to weak price signals and a lack of transparency in how public funds and TransLink revenues are connected to the road system and demand management. Public support for road pricing increases when the objective is congestion reduction rather than simply revenue generation. Three public engagement strategies to vet road pricing options are assessed and recommended.

Keywords: road pricing; congestion pricing; time-of-day tolling; public support/opposition; public consultation; qualitative research; costs of driving, perception gap; road use Metro Vancouver.

Executive Summary

Road pricing has been gaining popularity around the world as a way to reduce congestion and fund transportation infrastructure. Despite interest from major stakeholders in Metro Vancouver (BC Trucking Association, BC Chamber of Commerce, TransLink, Metro Vancouver), serious discussion about possible road pricing alternatives for Metro Vancouver has been virtually non-existent due to the political perception that the public is opposed to it.

However, research from the literature suggests that public opposition to road pricing:

- Decreases once the public sees the associated benefits such as increased transit funding and less road congestion
- Is partially rooted in misperceptions about transportation planning and funding
- Is more complex than simple surveying methods are able to capture

Using semi-structured interviews, I examine public perceptions of road pricing, the costs of congestion and driving, and the public's awareness of the current transportation funding system. Individuals' misperceptions about the costs of driving and the fuel tax are linked to weak price signals (individual vehicle trips carry no explicit reminder of the costs of driving), which helps explain the participants' initial opposition to road pricing concepts.

Interviews with three Metro Vancouver mayors and four stakeholders provide further guidance and critical evaluation of the findings. A case study of public outreach efforts in Minnesota (1995-2004) identifies valuable lessons for mounting an effective public engagement strategy in Metro Vancouver.

Along with the case study data, findings from the interviews with the public suggest that support for road pricing increases with information. In particular, support is highest when road pricing is characterized by:

- Time of day rather than flat tolls
- Revenues going to improve transit service
- Exemptions for HOV commuters

If the majority of the public supports some form of road pricing once they have sufficient information about the costs and benefits, then the obstacle to implementing road pricing is public engagement and education —not simply public opposition.

Policy Alternatives and Recommendations

The public is not likely to support any road pricing proposals until the current misperceptions around the costs of driving are lessened and the costs and benefits of road pricing are understood. In light of this, four policy alternatives are developed from the interview findings and evaluated for efficacy and equity. These are:

- Status Quo
- Fuel Receipt Detailing
- Transportation Simulation Game
- Citizens Assembly on Road Pricing (CARP)

The status quo describes current efforts by TransLink to engage the public on the subjects of transportation decision-making and road pricing. Maintenance of the provincial “guidelines for tolling” policy will continue to impede any significant efforts to engage the public on different road funding alternatives.

Improving the tax information provided on retail gas receipts (Fuel Receipt Detailing) helps reduce the misperception that “roads are free” and prepares the public to consider alternative ways of paying for roads and infrastructure.

“Transport Planner” is an on-line transportation simulation game designed to engage participants in the trade-offs of planning and policy decisions. Players are able to see how different decisions affect their personal travel costs, taxpayer costs, and projected congestion delays.

The final alternative, the CARP, is designed to bring the public into direct contact with road pricing alternatives for the region. Citizens from all 22 Metro Vancouver municipalities learn about and deliberate on different alternatives before recommending one for implementation by referendum. The CARP is intended to generate a transparent and citizen-driven process for determining whether Metro Vancouver would benefit from an alternative transportation funding system.

In addition to a number of areas for further study, I recommend implementation of all three alternatives to the status quo. However, timing and order of implementation is key. The receipt detailing and simulation game should happen immediately. The citizens’ assembly, however, would best be implemented 3-4 years from now to help ensure that the public is as prepared as possible for the proceedings and referendum.

With public transit funding not keeping pace with the region’s growth and the demand for road space on the rise, the Metro Vancouver region will not be able to ignore for long the costs and ineffectiveness of the status quo approach to funding the transportation network. With coordination, foresight and an engaged public, regional leaders will be better able to negotiate their way through the complex territory of developing an effective transportation network that the public supports.

Dedication

To Jeanie—my chief policy advisor.

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1: Background: The Baffling Problem of Road Congestion

1.1 Introduction

Few public policy problems are as baffling as what to do about traffic congestion. The conventional solution –to build more roads- has drained the public purse and provided little relief.¹ Paradoxically, the public wants to see less congestion, but has little appetite for raising taxes to pay for the cost of road maintenance, let alone expansion. A 2009 Angus Reid public opinion survey found that people in Metro Vancouver (formerly the Greater Vancouver Regional District) considered traffic and public transit the biggest urban challenges. Improving transit alternatives (and the transit mode share in the region) would provide some congestion relief, but recent funding issues with TransLink have put service expansion on hold.² Increasingly, regions are looking to road pricing as a possible solution. From ecologists to economists, a wide spectrum of academics and professionals agree that pricing congested roads can bring substantial net benefits to road users and society at large (Calfee and Winston, 1998; Brownstone and Small, 2005; Lari and Buckeye, 2007).

This study assumes that some form of road pricing (variable, time-of-day charging) could provide, in broad social terms, economic benefits to the Metro Vancouver region through congestion relief. The rise of road pricing initiatives around the world substantiates this assumption and points to the increasing feasibility of options made possible by new technologies. Where the public good nature of roads and limited technology formerly made it impossible, road

¹ As Gordon Price, director of SFU’s City Program, said in public lecture in 2008 “Name one city that has solved its congestion problems by adding more highways...”

² TransLink’s 2009 “10-year plan” shows that, even under the largest funding proposal (additional \$450M annually), transit mode share increases would be minimal.

pricing is now not only possible: it may be the most effective measure available for addressing one of society's costly problems: productivity losses due to congestion.

Why then, if the social and economic benefits are so clear, is there not more public support for road pricing policies? The answers, as this paper explores, are complex, rooted in local history, and, in some cases seem contradictory and just plain mysterious. This paper aims to de-mystify those contradictions, untangle the historical roots and provide a method for understanding public perceptions of congestion and road pricing.

Indeed, economists and planners must come to terms with a difficult fact: no matter how compelling and rational the argument, no matter how clear and abundant the evidence, in areas where no road pricing exists, public support for it appears to be very low. One more paper extolling the social and economic benefits would do little, I argue, to change this fact. I therefore turn my attention to the paradoxical question of: why, if the benefits of road pricing are so compelling, is public support for it so low? One theory is that a disconnect exists between political perceptions of public attitudes and actual public opinion (Arce and Zmud, 2008). This perception "often stems from the political nature of given communities and their various interest groups, which can obscure the majority opinion on complex subject matters such as tolling and road pricing"(Arce and Zmud, p.1). That public support for congestion pricing initiatives tends to increase after implementation (as it did in the case of London's area charge) demonstrates how public opinion tends to change once the public better understands how congestion pricing works. When the public has questions that go unanswered, opposition, understandably, tends to be higher. As one spokesperson for the state of New Jersey noted, "the public is not well-served when public opinion is tested before the Corzine administration has made any proposal" (Arce and Zmud, p.45). Alas, research that suggests a more complex picture of how public opinion and road pricing interact seems to be as obscure as politicians who support road pricing, and the cycle of misunderstanding continues.

This paper builds on the research and findings of another SFU graduate student project (Wightman, 2008) that analysed different road pricing options for Metro Vancouver. Not surprisingly, Wightman's analysis found that the most effective option for addressing road congestion was a system-wide tolling scheme that used time-of-day pricing to better distribute traffic over peak and off-peak times. Wightman provides a thorough analysis and discussion of the political feasibility (which is generally low) but spends little time on subject of public acceptance (also determined to be low). My aim is to examine the subject of public acceptance and in doing so, present research that compliments rather than duplicates Wightman's work.

To further clarify, examining public perceptions of specific road pricing options is not the primary focus of this study. While I use road pricing options to generate discussion with the public, and while some significant data is gathered in this area, the primary motive is to learn more about possible misperceptions of road pricing concepts and any cognitive dissonance around the costs of congestion and driving. Policy recommendations are based on how to address those misperceptions and gaps rather than how to measure support and opposition to specific road pricing options. Technical road pricing recommendations would be inappropriate here given the time and resource constraints of the project. Finally, for the sake of clarity, I do not address in any substantive way the environmental issues of congestion and road use. Such a subject warrants its own investigation and not just a chapter in this study.

1.2 Congestion defined

Traffic congestion is not the only rationale for road pricing, but it is probably the most pressing. In 2007, congestion cost Americans an estimated \$87.2 billion in extra travel time and wasted fuel, a concern that led Nobel economist Paul Krugman to remark that "trade is less of an issue for the US economy than congestion" (Calfee and Winston, 1998, p. 83). Congestion is defined variously. Many transportation authorities use a speed-related definition better suited to statistical analysis and planning, such as: "estimated speeds of less than 45 MPH in a 55MPH

zone”. This helps identify congestion problem areas and prioritize public investment for infrastructure changes such as road widening or expansion (MnDOT 2008 Congestion Report). This study, however, focuses on public perceptions of congestion, and the value individuals place on reducing congestion in Metro Vancouver. It is therefore important not to limit what can be learned from the public by imposing a narrow definition of congestion. Accordingly, I define congestion broadly as *any delay caused by the overcrowding of a road*. Note that this does not include delays as a result of accidents or weather. This study is concerned with systemic congestion that occurs repeatedly in certain areas at certain times.

So why does building more roads not solve the congestion problem? Increasing supply provides only a temporary solution due to latent demand; commuters who have previously avoided driving during congested times are “lured back onto the roads by the promise of uncongested travel” (Calfee and Winston, 1998, p. 97). This explains why adding capacity is an ineffective solution. Indeed, as Krugman indicates, the aggregate costs of congestion, if accurate, are staggering. But what if drivers perceive congestion to be a fact of life, an unavoidable part of urban living? If congestion is perceived as a necessary price for the autonomy and comfort of driving alone, then perhaps it is seen more as a price that must be paid than a problem that can be solved. The aggregated economic costs of congestion allow citizens to see what their individual actions mean in collective terms. But to determine the value of congestion-reducing measures such as road pricing for individuals in Metro Vancouver, we need to know what congestion means to individuals in that region.

1.3 Understanding congestion

Congestion is such a common part of daily life in cities, perhaps we forget to ask: why does congestion happen? The answer is not as obvious as it may seem. On a simple level, we might say congestion happens because there is not enough road space for the number of people that want to drive. But that is not completely true, because if the number of people that use the

roads were distributed more evenly over the course of a day, there would be no congestion. A slightly more accurate explanation might be that people value certain travel times (peak hours) more than others (early morning, late evening), which is true, but still somewhat incomplete. The answer that best gets at the complexity of why congestion exists is probably that drivers have no way of expressing the different values they place on peak hour road space. In other words, anyone who uses the road during peak hours clearly values driving at that time enough to offset the costs of congestion, but it is difficult to determine how much more some people value driving at peak times over others. This is important because, if as a region, it is a priority for more of us to use different modes (transit, carpool) or drive at different times (these are the only two ways of making more efficient use of the roads) then we will want to know the different values people attach to changing their behaviours.

To put these differing values in dollar terms, imagine the following scenario: two drivers are stuck in congestion at 5pm on the Port Mann Bridge trying to get home from work. One driver places a very high value on driving at that time. The other driver also values driving enough at that time to pay the price of congestion, but does not value it as much as the first driver. It is conceivable that, if these two drivers could work out an arrangement in advance, the first driver might be willing to pay the second driver, say \$5, to wait until 7pm to make her trip home, thereby freeing up road space at 5pm and making his trip faster. The second driver considers herself better off travelling at 7pm and being \$5 richer than receiving nothing and dealing with the 5pm congestion. This story illustrates the value obtained from a market transaction, where people have a mechanism for expressing their preferences and differing values associated with a particular good or bundle of goods. No such market exists for road space (at least in Metro Vancouver), and hence, we have some explanation for why congestion exists.

1.4 The Meaning of Congestion

This study is also concerned with what congestion means to different individuals. In my review of the literature, I found very little written about how meaning is constructed from people's perceptions and experience of congestion. It may be that "this void in the literature is primarily due to the fact that congestion is difficult to measure" (Jakus and Shaw, 1993, p. 390). In the economics literature the subject appears to be focused entirely on perceptions of expected delays, or, the difference between what people expect to encounter when thinking about a particular trip compared with what the actual delay would have been on a given day or period. But such a focus explains very little about how people feel about congestion and why.

This study deals more broadly with the subject of perceptions of congestion. The meaning an individual ascribes to the experience of congestion is inherently framed by that individual's life circumstances. For example, women who use the time stuck in traffic on their commute home to transition from "professional life" to "parental life", may think of time stuck in traffic more favourably than working parents who feel they do not spend as much time with their children as they would like. While my aim in this study was to deal with the experience of commuters, many interview participants resisted the singular focus and brought in their experiences of congestion for leisure trips. Indeed, if leisure activities happen on route to or from work, it is understandable that people's experience of congestion will be influenced accordingly. The more complex a picture we can build about the contexts from which individuals' preferences stem, the better researchers and policy makers will be able to respond to people's transportation needs and decision-making.

1.5 Regional Context

Metro Vancouver's stunning geography undoubtedly contributes to its distinction as "the most livable city in the world".³ But that geography, namely the water crossings, generates some of the most severe traffic congestion, a continual complaint for residents. A 2009 Angus Reid survey found that 69% of Vancouverites consider traffic and public transit as "the biggest infrastructure challenge facing cities today" (Angus Reid, 2009). Congestion in Metro Vancouver has many contributing factors from land use planning and the availability of transit to the cultural force of the auto industry to shape consumer preferences. But the simplest explanation for congestion in Metro Vancouver is that, due primarily to rapid population growth, demand for road space has been and continues growing at a faster rate than supply. This imbalance is exacerbated by the fact that the primary source for funding road infrastructure—the fuel tax—is shrinking as vehicles become more fuel-efficient. As the market for electric cars grows, there will be more cars on the road burning less fuel. This may be seen as a positive direction from an environmental perspective,⁴ but the decreasing pool of funds for building roads means, under the status quo, funding for roads will increasingly lag behind demand for road space.

Intergovernmental Issues

Currently, roadways in Metro Vancouver fall under the jurisdiction of all three levels of government: municipal, provincial and federal. Collaboration between all three levels of government (but particularly between municipal and provincial) is needed before Metro Vancouver is able to seriously evaluate different road pricing alternatives. The province's "guidelines for tolling" (2003) illustrates some of the challenges. The document was designed to provide guiding principles to the growing relationship between the provincial government and private sector development of highways. One principal, that tolls be used only for

³ *The Economist* called Vancouver 'the most livable city in the world' for 2009.

⁴ while more fuel efficient cars may be seen as better for the environment, the environmental costs of paving roads and manufacturing vehicles should not be overlooked.

highway/capacity expansion (article 1), suggests that the guidelines were designed without thought to congestion management principles—a cornerstone of road pricing alternatives. Another curious aspect of the document is the requirement for “reasonable untolled alternatives” to the tolled routes (article 3). Beyond the ambiguity of the word “reasonable”, there is a fundamental contradiction here. The only way a tolled route will be utilized by drivers is if it provides sufficient (or reasonable) benefits over untolled options. The more ‘reasonable’ the untolled option is, the less attractive the tolled route. Suffice it to say, the principles laid out in the province’s “guidelines for tolling” may be useful in certain transportation contexts, but congestion management is not one of them.

1.6 Assumptions

As described in the methodology, I attempt to take a dispassionate approach to the analysis of people’s experience of congestion and preferences around road pricing alternatives. However, this study makes certain normative assumptions about what is ‘good’ for the region. These assumptions are based on plans put forward by local, regional and provincial governments. The most fundamental assumption is that the Province of British Columbia and Metro Vancouver are working to become a more sustainable region. Evidence of this is abundant: municipal official community plans (OCPs), Metro Vancouver’s Regional Growth Strategy and numerous provincial plans including TransLink’s Transport 2040 and the Provincial Transit Plan make explicit references to sustainability. Provincial legislation has committed the region to making substantial reductions in GHG emissions by 2050, and reducing the region’s total vehicle kilometres driven (VKT) is part of the strategy. In light of these public documents, the assumptions of this paper are less normative and more a matter of what British Columbians, through legislation, have committed to.

1.7 Road Pricing: Definitions

Road pricing refers to a wide variety of policies in which “motorists pay directly for driving on a particular roadway or in a particular area” (Litman, 2008). The most common form of road pricing, tolling, has existed for centuries.⁵ For most people, tolling is associated with manually operated tollbooths and line-ups as vehicles cue to pay their fees. Modern tolling initiatives, however, rarely rely on physical tollbooths and tend to incorporate GPS or transponder technology, such as the system in place on the new (2009) Golden Ears Bridge in Metro Vancouver. Technological innovations over the last 30-40 years have opened up a wide variety of pricing techniques that can be tailored to meet the particular needs of different regions. The economic rationale for road pricing has led to countless papers on the subject, and an increasing number of functioning examples around the world.

There are now so many different road pricing systems in place worldwide, understanding the differences between them can be a challenge. Much of the confusion stems from blurring the physical/geographical nature (or form) of the different schemes with their policy objectives (or function). To clarify the difference between these, I first describe the basic differences in physical forms of road pricing. I then show how forms can be adapted to achieve different policy objectives based on how they are designed and implemented. The primary distinction in road pricing schemes is whether or not they have a congestion management component. By this, I mean the ability to charge on a per trip basis for the use of a road or for access to an area during peak times thereby motivating drivers not wanting to pay the higher fee to travel during off-peak times.

⁵ Adam Smith wrote about tolling in *An Inquiry into the Nature and Causes of the Wealth of Nations* (1776).

Road Pricing: Forms

Corridor Pricing charges a user fee or toll for a particular stretch of road or highway. Variations typically include highways, bridge tolls, or HOT (high occupancy/toll) lanes. How fees are collected can vary from toll booths (former system on Coquihalla highway) to more technology-intensive options such as transponders or GPS units, which allows drivers to pay without stopping (Golden Ears Bridge between Langley and Maple Ridge).

Cordon or Area Pricing applies a charge to the use of all roads within a certain geographical area. London, Stockholm and Singapore are examples of the most sophisticated applications of this type of road pricing. Area pricing relies almost exclusively on electronic identification technology. Though not commonly thought of as forms of road pricing, parking and vehicle registration fees within a particular jurisdiction can serve as a simple form of area pricing. Cordon and area pricing are commonly referred to as “congestion pricing”, but the degree to which they reduce congestion is a question of design.

Distance-Based Pricing charges drivers a fee based on the distance travelled within a certain geographical area. One method of distance-based pricing charges a fee at the time of vehicle registration for kilometres driven. GPS versions of distance-based charging can integrate a congestion management component by charging drivers based on movement within and between zones of a metropolitan area, with the potential for higher fees during peak times. Fees can be billed to residents like utilities, or assessed at gas stations and ‘paid at the pump’. Distance-based pricing has not been widely implemented outside of Germany, but Portland, Oregon has piloted a sophisticated model using GPS technology.

Road Pricing: Functions

The policy objectives (or function) of a particular road pricing initiative depend on its design. The most fundamental question of design is around the capacity to manage congestion in

specific geographical areas like bridges, highways, or city centres. To effectively manage congestion, rates have to vary based on the time of day. As the price of roads during peak time use go up, drivers wishing to save money shift to more economical modes (car-pool, public transit), change the time of their trip to an off-peak period, or avoid the trip altogether.

Another important function of road pricing is the ability to raise revenue. Governments looking to replace the declining funds generated by the fuel tax (described earlier) are increasingly looking to road pricing as an option. Examples of road pricing specifically designed to raise revenue are distance-based pricing and 24 hour tolls, such as the former Coquihalla system.

Another important function is the capacity to reduce the environmental footprint of driving in a region. When people drive less, they emit less—both in terms of local air contaminants (smog) and carbon dioxide (GHGs). For road pricing to have a significant positive impact on the environment, the total number of trips or vehicle kilometres travelled (VKT) must be reduced. Simply shifting trips to non-peak hours (as some congestion schemes do) has little impact on GHG or local air contaminants reductions.

Road pricing can help meet other regional objectives, such as increasing transit mode share, encouraging people to live close to where they work, and building more complete communities that are less dependent on the automobile. The latter is more likely to be a long-term effect of road pricing however, and much more difficult to measure than changes in transit ridership, vehicle kilometres travelled or congestion levels. Although congestion pricing is a branch within the larger family of road pricing concepts, I use the two terms interchangeably in this study.

1.8 Equity and Social Impacts

Road pricing raises a number of concerns over social equity and fairness. The primary concern is the financial burden placed on low income drivers for whom alternatives to SOV driving are lacking. This burden can be minimized given predictable and gradual implementation, allowing road users to make adjustments in their travel patterns. The degree to which road pricing is regressive in nature depends upon its design, the quality of available travel alternatives, and how revenues are used (Giuliano, 1994; Litman, 2008). I argue that it is not only the availability of travel alternatives that is important in addressing social impacts, but the degree to which lower income groups are aware of the substitutes; if a single mother commuting three hours to and from work every day does not know the details of car sharing programs or bus service in her area, they are not alternatives for her. In other words, information about alternatives is as important as the alternatives themselves.

Privacy concerns also figure importantly in many road pricing alternatives. Tradeoffs between efficient yet data-reliant technology (GPS, transponders) and inefficient yet anonymous tollbooths or annual odometer checks (for distance-based pricing) are inevitable. Real and perceived privacy concerns must be addressed for road pricing initiatives to be feasible. Hong Kong, for example had done extensive field trials on an electronic congestion pricing system before withdrawing it due to public opposition. The opposition was specifically around privacy concerns (Small and Gomez-Ibanez, 1998).

It is important to note that the current system also has social equity issues. Chief among these is the concern over who pays for the roadway under our current fuel tax generated funding system. Vehicles that burn less fuel per kilometre pay proportionately less for the road they use than vehicles that burn more fuel. If only middle and higher income groups are able to afford the newest fuel-efficient technology, such as hybrids and electric cars, the tax burden will increasingly fall on lower income users who typically buy second-hand vehicles: today's SUV's

and less efficient cars. The social equity concerns of using the fuel tax to fund road costs are therefore likely to increase under the status quo fuel tax funding approach.

2: Methodology: A Pragmatic Approach

2.1 Overview

The primary method for generating data in this study is a series of in-depth interviews with 10 members of the Metro Vancouver public. The interviews with the public are followed by a second set of interviews with key stakeholders and mayors from the region, as well as a case study analysis of public outreach in the context of road pricing. The interviews with the public serve two functions: to understand different Metro Vancouver residents' perceptions of congestion and barriers to understanding road pricing concepts, and to determine the value of a qualitative approach to understanding the problem of congestion. The key informant interviews (the second set) reflect on the findings of the interviews with the public, and comment on the feasibility and effectiveness of the proposed policy options. The case study also grounds the evaluation of the policy options by providing a structure for analysis and lessons and ideas for effective public engagement strategies for Metro Vancouver in the context of potential road pricing proposals.

To be clear, the interviews with the public do not constitute a representative sample of the population. The rationale for using an illustrative (rather than a representative) sample in this study is three-fold. First, given the project's time and resource constraints, gathering a representative qualitative sample would not have been feasible. Second, evidence suggests that, when attempting to understand perceptions of a phenomenon, conventional quantitative survey methods produce unreliable results due to methodological limitations, particularly when estimating people's willingness to pay through contingent valuation (Brownstone and Small, 2005; Hanemann, 1994). Third, the relatively small but promising amount of existing literature using qualitative approaches to gauge public opinion on road pricing warrants further study

(Ungemah et al. 2005). The methodological choices I make here serve the primary goals of this study: to contribute to the growing body of literature using interviews as a means for gauging opinion on complex public initiatives, and contribute to a policy process that reflects a more nuanced picture of public opinion than what can be obtained through general surveys and macro-level case-studies.

If the province (with or without TransLink) and the Metro Vancouver municipalities are going to consider some form of road pricing in the future, it will be critical to understand the role of public engagement in that process. Successful implementation of any road pricing strategy will rely on public support, and that support will grow from transparent efforts to inform and understand the public's preferences (Shaffer, 2009). The methodologies used here are ultimately to provide information to policy makers for how to best inform and engage the public in the process of road pricing initiatives.

2.2 Methodological Framework

The methodological framework I adhere to in this study falls under the pragmatic paradigm (Tashakkori and Teddlie, 2003; Morgan, 2007). Pragmatism as a research paradigm evolved out of a desire to further qualitative research design while moving beyond the metaphysical debates that characterized qualitative research methods through the 1980s (Morgan, 2007). A pragmatic approach to research design is particularly appropriate in the context of public policy issues because of its emphasis on practicality and usefulness. It values both quantitative and qualitative methods, and asks not which is superior, but *when* might one be more appropriate than the other, or, perhaps, how both might serve to enhance our depth of understanding of a particular subject. A good example of how pragmatism has structured this study is the use of interview-based contingent valuation (see below for details), which takes a more qualitative approach to a traditionally quantitative surveying technique. Supported by the National Oceanic and Atmospheric Administration (NOAA) panel on contingent valuation, in-

person interviews are recommended for their “superior reliability” over traditional survey techniques (Hanneman, p.22).

2.3 Interviews

This section discusses methodological considerations for the interviews with the Metro Vancouver public. I discuss: the tradeoffs between representative and non-representative samples, issues and limitations of ‘stated preference’ versus ‘revealed preference’ data, and the choices I make with respect to interview design. By engaging participants in discussion on road pricing objectives and impacts, I aim to better understand people’s perceptions, particularly around barriers to understanding benefits associated with road pricing.

Trade-offs between Representative and Illustrative Samples

Choosing between surveys and interviews involves tradeoffs. When I use the word ‘survey’ I am referring to the collection of a large, random sample from which data is numerically coded, and cross-tabulations and probabilities can be generated. By ‘interviews’ I am referring to the collection of a non-representative sample that relies on qualitative data. While quantitative analysis of interviews is possible (content analysis), it is not possible to generate cross tabulations and probabilities that allow for generalization. The primary benefit of a representative sample survey is the potential to generalize about the population. A limitation however is that the results are based on the assumption that the participants all interpreted the question the same way: a dangerous assumption when investigating complex or vague concepts, or when using words that have multiple meanings. Such issues can thoroughly limit the reliability of the survey data. Large, representative surveys are particularly useful for capturing a snapshot of opinion. But the strength of the survey results begins to weaken as people’s opinions evolve and change over time.

Interviews involve a different set of tradeoffs. Information cannot easily be used to generalize about the public, but there can be more confidence that participants correctly

interpreted a question, at least to the extent that the researchers have intended it to be interpreted. Interviews also allow participants the opportunity to ask for further clarification or explanation in the context of complex concepts, such as road pricing options and policy objectives. Other valuable information can be noted in interviews such as body language, tone, and a closer reading of the sincerity, time and care with which a participant answers questions. Due to the complexity and contentiousness around the subject of road pricing, I consider an illustrative sample using interviews to be the most useful method for estimating value of time savings, determining pre-interview familiarity with road pricing, and gauging participants' ability to engage with the concepts.

Contingent Valuation and Revealed vs. Stated Preferences

In economics, there are two ways to determine the value an individual places on a good or service: through revealed preferences or through stated preferences. In most cases, market transactions reveal the value individuals place on goods or services. Even some goods that are not bought and sold directly like air quality or occupational risk can be estimated through associated market transactions such as property values or wage rates, respectively. This econometric method is known as hedonic pricing. But when neither market transactions nor hedonic pricing techniques provide useful indications of people's preferences and values, stated preferences techniques are needed to fill the void.

One common stated preference method is contingent valuation. Contingent valuation refers to a method in which people are surveyed to determine how much they would be willing to pay for a good, or conversely, how much compensation they would require to accept a negative consequence. It has become an integral part of benefit-cost analysis, in part because it allows legislators to "obtain information on the public's value for government programs" (Hanneman p. 20). Market research firms also use contingent valuation techniques to estimate consumer demand for products. Economists argue that the benefits of road pricing can be measured by asking the

public what they would be willing to pay to reduce congestion, and improve travel time and reliability. If residents of a particular region have a relatively high value of time savings, the economic rationale for reducing congestion through road pricing is accordingly strong. In the absence of market mechanisms that reveal people's value of time savings, contingent valuation techniques help transportation planners determine the value of congestion reduction with respect to people's stated preferences and value of time in the context of transportation.

However, there are a number of problems with contingent valuation that challenge the reliability of the method. The obvious questions that arise in asking people what they *would* do based on hypothetical scenarios are: do they fully understand the good in question (context issue), and how do we know whether they *will* do what they say they would?

The debate around the reliability of contingent valuation came to a climax with the NOAA Panel in 1993 (Portney, 1994; Hanemann, 1994). Critics of contingent valuation argue that its tendency to produce unreliable results leads to ill-informed decision making. Proponents point out that unreliable results stem from poorly administered surveys, and that obstacles can be overcome with the careful design and administering of questions. A key recommendation from the NOAA debate was that interviews are more "reliable" than surveys as a method of estimation, particularly because of the opportunity to specify context and clarify whether questions have been interpreted as intended by the researchers (Hanemann, p.21).

Estimating people's willingness to pay for time savings has been attempted through both revealed preference and stated preferences studies. Revealed preference studies typically involve calculating the time savings possible in moving from public transit to a private vehicle and the associated costs in that shift (Callee and Winston, 1997). The difficulty with this technique of course is that people have multiple reasons for choosing personal vehicles over public transit (comfort, social status, job requirements) and its accuracy therefore depends on the researchers' ability to isolate the impact of time savings on mode choice.

When estimating value, asking people what they have *done* is more reliable than asking them what they *plan* to do. Better still though is to *watch* what people do, because it removes the possibility of lying or mis-remembering. Recent road pricing initiatives in California and Houston, Texas have brought valuable new information to bear on the reliability debate of contingent valuation/stated preference-driven estimation techniques. Based on drivers' use of HOT lanes, (Brownstone and Small, 2005) researchers have been able to determine with unprecedented specificity what people are willing to pay to reduce travel time in the context of congestion. The data from the HOT lane initiatives also provides a rare opportunity to examine the gap between stated and revealed preferences methodologies. In a groundbreaking study, Brownstone and Small (2005) conducted a stated preference (contingent valuation) survey of the same group using the HOT lanes on a semi-regular basis. They determined conclusively that people's stated value of time savings is much lower than their observed value of time savings. In other words, in practice, drivers in the study actually used the priced express lanes more than they said they do.

It is the significant gap between revealed and stated preference that, in part, motivates the in-depth interviews methodology of this study. By using interviews rather than surveys I am better able to specify the context in which congestion and time savings occur. Thus, statements made about willingness to pay for improvements in travel time should accordingly be more reliable. Interviews also allow for opportunities to clarify information on an individual basis, yielding richer data than what might otherwise be possible through a representative sample survey.

Interview Design

When limited to a relatively small number of interviews, the question of who comprises the sample becomes very important. My goal in choosing interview participants is to reach as broad a domain of experience and opinions as possible. To help structure the scheduling of

interviews, I use a matrix to make clear my choices around sample demographics. My sample covers municipalities north and south of the Fraser, peak and non-peak, (both drivers, and transit users), commercial and recreational road users. As a starting point, I use Metro Vancouver's data on transportation mode share to determine the sample's proportion of drivers to transit users. Among drivers, I have weighted the sample toward regular commuters, not just because they are responsible for a significant number of vehicle trips in the region, but also because any road pricing strategies would disproportionately impact their social welfare regardless of whether those impacts are positive or negative.

The objective in each interview is to create an environment in which the participant can engage in an open dialogue about the experience of congestion, his or her willingness to pay to avoid it, and what kind of support or opposition they have toward various road pricing concepts. Participants are informed in advance that in the transcription process they will be made anonymous to protect their identity. Less obvious to the participants, but equally important to the research is how the open interview environment helps uncover areas in which people have barriers to understanding road pricing objectives and road use issues.

The willingness to pay exercise, done near the beginning of the interview, allows participants to start thinking about the value they place on time savings in the context of road congestion. In addition to providing concrete data on what people might be willing to pay in tolls or charges given a certain reduction in congestion, the exercise also uncovers other information about the cognitive dissonance around time spent in congestion. As discussed in the "results" section, for example: is congestion stressful, or is it a way to slow down an otherwise busy day? Is it productive time or simply "wasted time"? To personalize the section on willingness to pay, each participant is asked to describe a scenario in which they encounter congestion. Based on that description, hypothetical scenarios are devised such that their willingness to pay to avoid the

congestion is based on a personally relevant example. Referendum style questions are used to limit strategic bias, and different price points are used to limit bidding entry bias.

The final section of the interview encourages participants to discuss their opinions on different road pricing scenarios. Trial interviews demonstrated the importance of not over-burdening participants with technical information around road pricing options. Participants come to the interview session with varying degrees of knowledge about road pricing so it is appropriate that varying amounts of information and explanation are needed from the researcher. The interviews are not intended to be information sessions for the participants; I endeavour to present just enough information for each participant to be able to discuss his or her opinions on the issues and tradeoffs between the status quo and different alternatives. These are: time of day tolling, GPS distance-based charging, and HOT lanes. I do not attempt to provide interview participants with information on road pricing prior to the interview. To do so would compromise one of the core objectives of the study: to see how opinions and preferences change with the introduction of new information. It is made clear to each participant that the goal of the information is not to persuade but rather to inform the participant of relevant issues.

In retrospect, it should be noted that as the interviews progressed, the interview schedule was expanded to accommodate unexpected issues and subjects. In particular, the subject of transparency of costs and the issues around the fuel tax became fundamental to the scope and focus of the research. I also added a “trade-offs game” on the seventh interview to confront participants more directly on the issue of future decision making in the context of population growth and increased demand for road space. Participants were given a theoretical choice between building more roads (more expensive) or a program that required everyone to carpool one out of every five workdays (less expensive). The results of these changes are described in more detail in the “results” section.

2.4 Key Informant Interviews

The second set of interviews, comprised of major stakeholders in transportation and goods movement as well as a number of Metro Vancouver mayors, brings political and stakeholder perspectives to the policy problem of congestion. The key informants are also invited to comment on the political feasibility and effectiveness of the policy options developed at the end of the data analysis.

To help focus and facilitate comments on the different policy options, I use visual aides with the stakeholders and mayors. Unlike the interviews with the public, which are intended to be open-ended discussions about congestion costs and general objectives of road pricing, the interviews with mayors and stakeholders are conducted near the end of the project, and therefore can include specific policy options that were inappropriate given the methodology and objectives of the primary set of interviews.

To ensure regional equity and that political voices are heard from “both sides of the Fraser” the key informant sample is comprised of mayors and stakeholders from: Vancouver, Coquitlam, Maple Ridge, Surrey, City of Langley, and Township of Langley. More key informant interviews from other municipalities would have been helpful to understand the breadth of knowledge and perspectives on the issue. However, due to the difficult nature of securing interviews with mayors and busy professionals, the interview sample is limited to six key informants. The section on “data analysis” discusses the results of the key informant interviews.

2.5 Interview Analysis Process

To say the analysis of the interviews is a process of extracting data would not sufficiently acknowledge the role I play in the initial shaping of the responses, or the construction of meaning that results from organizing the responses into “useful themes. It would be more appropriate to

describe the process as one in which the researcher develops different ways of thinking about and acting on the problem of congestion through the consideration of a particular set of data.

The processes for analysing the data from the interviews with the public and key informant interviews are different. This is primarily due to the different objectives I had for each data set. While the interviews with the public form the bulk of the data for understanding the problem (public perceptions of congestion and opposition to road pricing), the data from the key informant interviews is primarily to inform the construction and evaluation of the policy options presented at the end of the paper.

To analysis the various responses given by the participants from the public, I break the transcripts down into theme areas based on the chronology of the interview schedule. I first describe any outstanding contextual features of the interview setting as well as any body language or non-verbal characteristics that may help explain the responses of a given participant. Second, I describe the exercise to estimate the willingness to pay for time savings. I am interested less in the exact number that comes from this exercise and more in the process of how people relate (or do not relate as it turned out) to translating their experience of congestion into a willingness to pay to avoid it.

Due to the semi-structured format, some of the interviews moved into discussions on cost transparency and fuel tax issues before discussing costs and benefits of different road pricing options, while for others it was the opposite. Either way, the interview transcripts were analysed for relevant comments on both of those subjects, as well as any other topics that were not intended through the interview schedule but arose nevertheless and provided interesting data for consideration within the context of the problem.

The analysis of the key informant interviews was much more simplistic. Due to the energetic communication style of many mayors and stakeholders, much of the interview time was spent on topics tangential to the research problem. I therefore chose not to transcribe the key

informant interviews in their entirety; rather, I transcribed only sections that were clearly related to the policy problem and/or policy recommendations.

2.6 Case Study

Initially, the study design for this project was to include a primary set of interviews with the public, followed by a supporting set of interviews with public officials (mayors, counsellors, and stakeholders). However, it became evident through the course of the interviews with the public that perceptions of the costs of congestion and road pricing strategies were strongly linked to education and availability of information, and that the study would therefore benefit from supplementary investigations into effective public outreach strategies in the context of road pricing initiatives. This section briefly describes the case study method used in this study.

The aim of this paper's case study is to examine the phenomenon of public outreach and engagement in the context of road pricing implementation. Methodologically, the case study is used to "elucidate features of a larger class of similar phenomena" (Gerring, 2004). One strength of the case study as a method for public policy analysis is its ability to inform the decision-making in a region that has limited experience with certain subjects (such as Metro Vancouver and road pricing initiatives). A weakness of the method, however, is the uncertainty around the applicability of the experiences from one region to another. Recognizing the various strengths and weakness of the method, I use the case of Minnesota, which has a substantial record of public consultation efforts for the purpose of implementing road pricing initiatives dating from the mid-1990s to the present. I have selected this case for the following reasons:

1. The Minnesota case exhibits a number of political, geographical and cultural similarities to Metro Vancouver, namely: it was a government sponsored initiative; the road pricing area in question involved bordering cities (St. Paul and

Minneapolis); the Metro Vancouver public likely shares more cultural similarities with Minnesota, than with US states further south or European cities.

2. Of the various U.S. cases considered (Oregon, Texas, California, Colorado), Minnesota had the strongest documentation of the public outreach process that accompanied their road pricing implementation.

The experience gained by public officials in the Minnesota case is particularly useful to the objectives of this paper because of the significant obstacles they faced from lack of public understanding. Lessons from the Minnesota case are ultimately drawn out and evaluated for their applicability to Metro Vancouver.

The main weakness identified in the case study analysis of Minnesota is that a number of the lessons learned from that region pertain specifically to a public outreach focused on the adoption of a specific road pricing concept (HOT lanes). The policy focus of this paper, however, is to engage the public more broadly on building awareness of transportation costs and to review a range of options for congestion reduction. While the majority of the lessons from Minnesota could be applied to a broader public outreach effort for road pricing, the notion of “selling” the public on a particular option is not relevant to the aims of this paper.

To address this weakness in the relationship between the Minnesota case and the policy objectives of this paper, I added a brief section on “best practices” in public consultation. This section is based around the experience of individual municipal transportation authorities in the UK in their planning and public outreach efforts. In one study (Bickerstaff et al., 2001) vast amounts of survey data was analysed to develop findings around the impacts of different approaches to public consultation. Viewpoints from the authorities as well as participating members of the public were analysed to develop themes and discussion on “effectiveness”, and “successful” public outreach methods. By supporting the project-specific case of Minnesota with

an analysis of the broader goals of effective and meaningful public outreach in the UK, a foundation is established on which policy options relevant to this paper can be evaluated.

3: People's Perceptions of Congestion and Road Pricing

This section presents analysis and findings from the interviews with the public and the key informants. I quickly learned from the interviews with the public that the semi-structured interview approach I outlined in the methodology comes with tradeoffs. The benefit of allowing the participants to speak freely (not strictly bound to the researchers pre-determined ideas of what is important), which allows for rich data on public perceptions, also means participants are able to steer the conversation in directions completely outside the scope of the study. At times, it was difficult to keep participants on track. A desire to see improvements to transit formed a common theme. But other information and insights were made possible as a result of the flexibility afforded by the semi-structured approach. The open interview environment led to what I believe were more genuine, considered responses because of the natural, conversational interaction between the participant and the researcher.

Interview #1

Participant: Mic

Municipality: Richmond

Of all the interview participants in the first sample, Mic spends the most time commuting by vehicle. His driving patterns are consistent, predictable and split between Richmond and Surrey (his primary workplace), and Richmond and Vancouver (his secondary workplace). When he drives to Vancouver, he consistently spends an extra forty minutes driving in each direction for a total congestion delay of one hour and twenty minutes per day. He reckons that 40% of his weekly gas bill of \$120 is consumed by idling in traffic congestion (lines 26-27).

To estimate Mic's willingness to pay for time savings in the context of driving to work, I construct a hypothetical scenario using the information he has given me about his commute from

Richmond to Vancouver. The following text shows the eagerness with which Mic responds to the idea of a pay-per-use express lane, or a HOT lane and how I use that information to extract a rough estimate of his willingness to pay:

MARK: This allows single occupancy drivers to use them, for a fee. So essentially people have a choice between sitting in congestion, or, paying their way onto an express lane in a sense. So, just keeping that in mind, in your trip to Vancouver if you had the option...

MIC: (interrupting) I'd pay it every single day.

MARK: Right, so one of the things I am trying to get at is, what is that worth to people. If you were saving 40 minutes, would that be worth \$15 dollars to you? (lines 49-55)

Mic is not willing to pay \$15 dollars to reduce his trip by 40 minutes. He would however consider paying at least \$10. This suggests Mic values time savings in the context of commuting at approximately \$15/hour. Analysis of the transcript shows that Mic does not seem to understand the ability of a variable rate HOT lane to ensure a congestion-free route. What is clear is that Mic correctly perceived the hypothetical scenario to be congestion free, and has therefore given a reliable response to the contingent valuation of time savings.

Mic's perceptions and thoughts on the other policy options (distance-based charges and tolls) are generally unsupportive. The reason for his lack of support appears to be grounded in the belief that charging people more for using the roads will not lead to a reduction in the number of people that drive. He states: "I don't think people are going to drive less because they know they are paying more. I think it will lead to more frustration" (lines 92-94). When pressed further on this subject, Mic is consistent. He reports no change in driving behavior for the period of 2008 when gas prices reached \$1.50/litre in Metro Vancouver. In fact, he believes no one at all changed their driving behavior due to the price increase of gasoline, which we know is not true based on the other interviews in the sample. This perception is likely rooted in the relatively high

socio-economic bracket in which Mic lives, as well as his workplace and/or peer culture. If this is true, the policy implications could be that road pricing implementation would do little to change the behaviors of middle to higher-income drivers.

When asked about tolling policies, Mic is not supportive. He demonstrates a concern for lower-income families that currently commute from areas poorly served by transit and said that both distance-based pricing and tolling would “disadvantage them further” (lines 238-239).

When I tell Mic that revenues from road pricing can help provide more travel options for lower-income groups, he agrees, but does not change his position. Strangely, despite the half hour conversation about different options, Mic concludes the interview by referring to congestion as “something we gotta live with, I guess” (line 249).

Interview #2

Participant: Nanti

Municipality: Coquitlam

Nanti is a north of the Fraser driver that does semi-frequent trips in variable patterns. He drives often to Vancouver from Coquitlam as well as to Richmond and other municipalities south of the Fraser. When asked to describe the costs of congestion he notes both the personal costs (time) and the costs to industry and commercial trucking (money). From the start of the interview, Nanti is eager to talk about congestion issues in Metro Vancouver and makes numerous references throughout the interview to his congestion and transit experiences in Hong Kong where he grew up. It occurs to me that Metro Vancouver’s immigrant-rich demography could play an important role in any efforts to educate the public on the costs and benefits of potential road pricing policies, which are much more prevalent in Europe and Asia than they are in North America.

To generate a value for Nanti’s willingness to pay for time savings, I use the travel scenario he describes driving from Coquitlam to Vancouver on a regular morning. Nanti

determines the extra time involved in this trip due to congestion is 30 minutes. He acknowledges the cost of gas associated with the 30-minute delay to be about \$5. However, I am unable to frame the question in a way that elicits a firm answer from Nanti in dollar terms. Whether he chooses to use the HOT lane appears to depend totally on his schedule. He claims: "If I have nothing to do? I would stick it out in traffic". If he were late for an appointment, he would pay \$10 for access to the hypothetical HOT lane. Because Nanti relates the value of the time savings to the cost of being late for an appointment, I cannot say with confidence that \$10 is in fact the value he attaches to saving 30 minutes of time. To correct for this, I take the average of the two amounts he stated in conjunction with the question, which is \$7.50.

In the next section of the interview I ask Nanti about the relationship between the costs of driving and the number of trips. When asked whether his behavior changed in response to gas prices in 2008, he says: "No, I think it won't influence me. But influence other people because I heard a lot of people they switch from driving to transit because the gas gone up". (lines 100-101). But later in the interview, upon further reflection he remarks that he did in fact make a point of making less recreational trips by car during that period.

MARK: Do you think that if that price was enough, it would influence people to switch, or to stop driving? Or not to stop driving, but to drive less?

NANTI: I think that, that would. That would happen, because now it's hidden, nobody kind of think about it. If you tell me, oh you drive to Richmond today it's other than the gas you have to pay an extra five bucks, it does actually. Actually, that's a good point, when the gas gone up I did, I drove less to Richmond. I used to go to Richmond quite often, to meet friends, do this do that. Even, oh I have nothing to do, just drive out there. And I create extra car on the road and for nothing? It's not work. It's not a must. But when the gas gone up, I drove less, because you start thinking, I drove back and forth it costs \$10 bucks, so why am I going? Just stay local. (125-136)

This passage also shows Nanti's thoughts on a distance charge and forms part of a larger conversation on cost transparency in driving. He believes having the costs of driving presented in a more transparent way (than the current gas tax) would influence people to drive less (lines 134-135). While he supports the idea of making the costs more transparent, his support for a distance charge rests on it replacing, rather than adding to, the gas tax.

The value of in-depth interviews becomes clear during the discussion of tolling because the format allows for much needed clarification on some of the technical issues. Nanti's initial reaction to tolling is that tolls simply cause more congestion due to line-ups at the tollbooths. Even though he was aware of the Golden Ears Bridge as an electronic toll, his initial perceptions of tolling were strongly influenced by an out-dated picture of cash transactions at tollbooths.

After considering the three different road pricing options, Nanti remarks: "I think I like the toll idea. But would the gas price be lower? Because now the price gone up." (lines 154-155). When Nanti says, 'the price gone up' he is referring to a recent increase in the fuel surcharge that was to commence in January of 2010. Again, he appears to value the impact a more transparent method such as tolling might have on people's decision to drive. But he does not support any increases in the over-all cost of driving. Unlike Mic, Nanti does believe people drive less (himself included) when the costs of driving go up, however, he does not appear to value that potential reduction in drivers and congestion enough to support a road pricing policy that raises the costs of driving. When asked to choose between a flat rate toll and a variable toll (congestion management) he prefers the variable toll. Although he adds that this is primarily because he can often avoid the peak hours.

It became clear early on in the interviews that I had to steer participants away from focusing unnecessarily on transit issues. Nanti raises a number of concerns over the transit system. But fortunately I do not steer him away too quickly; a story about his wife's motivations for choosing transit over driving provides insights into the subject of how people view

alternatives. For her, although it was faster than transit, driving represents a greater loss of time because when driving she is occupied with the task of operating the vehicle. On transit, she can sleep, relax or read, none of which she considers a waste of time. From a public consultation perspective, this could be an important part of framing the discussion on driving and alternatives to driving. It also reiterates the importance of experience—actually riding on transit, actually trying carpooling- to individuals’ perception of various alternatives as being feasible. A driver with no experience of transit or car-pooling is less likely to consider it as a realistic alternative to those with some past experience. The following exchange shows Nanti’s views on the relationship between non-transit users and the (low) probability of this group to think about transit as an alternative to driving:

MARK: “My sense is that a lot of people that have never taken transit don’t think about those benefits when they are weighing their options.

NANTI: I know! I know about those benefits!

MARK: You do. I don’t think people who have never taken transit before? I don’t know if they realize or think they think about those things.

NANTI: They never think. I don’t think they think. But those are good things! Because you can get better control over your time” (lines 221-228).

In sum the interview with Nanti represents a compelling example of why public perceptions of road pricing policies are best sought through dynamic research methods such as interviews or focus groups, where, if needed, further information and clarification can be obtained by both the participant and the investigator.

Interview #3

Participant: Kevin

Municipality: Abbotsford

Kevin represents another commuter from south of the Fraser, however compared with Mic, his travel patterns and times are variable and less frequent. The distance between Abbotsford and many of the Metro Vancouver municipalities (and especially Vancouver) results in highly unpredictable driving times for Kevin. In severe conditions, a one-hour trip with no congestion can take over 2.5 hours “if there is weather” (line 38).

To estimate Kevin’s willingness to pay for time savings, I use the description of his trip from Abbotsford to Vancouver. To keep it simple, I ask him whether bypassing an hour of congestion is worth \$15 to him. Like Nanti, Kevin resists the referendum-style contingent valuation question by viewing it within the context being late for a particular event. For shopping and leisure activities, he states \$15 would be too much, but there would be “no question” that he would pay \$5 (lines 12-13). In transcribing the interview, a further complication was detected. My initial question asks Kevin to think about the value of a one-hour time savings. However his response later indicates that he mis-heard the question as a half hour of time savings. Consequently, it is difficult to identify an exact value for Kevin’s willingness to pay for time savings. Using the average of the two values stated (\$5 and \$15), as well as the average between the two interpretations of time savings (30 and 60 minutes), I arrive at the value of \$10 for 45 minutes of time savings. The only consolation to this otherwise questionable result is the confidence one can have in the transcript, from which Kevin’s support for the idea of the HOT lane and its potential for travel time savings and reliability is evident.

Kevin takes interest in the distance-based pricing policy and responds by saying “I like the concept, I don’t have a problem with it”. But he goes on to say, “I don’t think it would affect my driving pattern” (lines 50-51). This is understandable in light of Abbotsford’s remote location; few if any municipalities would have fewer alternatives to driving. It is also worth noting that

Kevin already carpools semi-regularly, so the behavioral changes policy makers would hope for in implementing distance based-pricing are already occurring in Kevin's case.

Kevin is one of the few participants that demonstrates a clear grasp of the objectives behind congestion tolling, relating the idea to a former BC ferries policy that offered lower fares for certain off-peak sailings. Not surprisingly, when confronted with the choice between flat and variable tolls, Kevin states that he "resonates with (the variable toll) option" (line 112).

Kevin is also the only participant in the first set of interviews to demonstrate an understanding of the long-term effects of increases in the cost of driving. He notes how the cost of commuting has driven him to create more work for himself in his own community:

MARK: ...if the cost of commuting were more expensive...

KEVIN: My brother says, nothing will really happen until gas is six dollars a litre. Then, you know what? It doesn't pay to go to Vancouver, forget it, I am not interested in working downtown. I have to spend too much of my income getting there. So if we're really serious, we should put \$5 a litre tax and: problem solved overnight. There would be a huge hue and cry, but instantly, there would be traffic freedom, people would start working from home. (175-181)

On first reading of the interview transcript I was surprised that Kevin suggested a fuel tax as a method for increasing the cost of driving, because he had already shown a good understanding of and support for other more equity-oriented alternatives. It's important to remember though that, while the researcher is familiar with policy alternatives to the fuel tax, for most of the participants the fuel tax is what they have lived with, what they are familiar with. In this light, Kevin's suggestion for an increased fuel tax is understandable. To engage Kevin in the equity issues inherent in the different policies, I point out the free-rider problem of electric

vehicles under a fuel tax policy. He easily goes on to identify the improvements in equity in a distance-based charge and, to a lesser extent, system wide tolls (lines 194-196).

In conclusion, it should be emphasized that while Kevin was able to articulate the rationale and many of the social benefits of the different road pricing policies, he did not express explicit support for these changes. Understandably, the burden of such policies would fall heavily on residents of remote areas such as Abbotsford, and more heavily on individuals such as Kevin who comprise the lower-middle income group in those areas.

Interview #4

Participant: Pat

Municipality: Surrey

Pat currently commutes from Surrey to various locations in North Vancouver, five days per week during peak hours. Because he has some flexibility in deciding his hours, he typically avoids the worst period of peak travel by leaving early. Congestion on the commute home is worse; what would normally be a 30-35 minute trip routinely takes 90 minutes, and three days a week it is normal for it to take “two to three hours”. Pat finds the delays resulting from congestion very difficult, and while reflecting on how much time he spends per week in his car says: “I can’t deal with it anymore”.⁶

My attempt to estimate Pat’s willingness to pay for travel-time savings is somewhat compromised by specification problems. It is clear from the interview transcript that he correctly understood the trade available (\$10 for 45 minutes of time savings). However, in his response he also refers to the fact that he would be even more inclined to pay the \$10 fee if traffic were to get worse. This is understandable, however, it ignores the fact that increased delays would presumably create more aggregate demand for the express lane, which would in turn drive the fee up. It appears as though, in the absence of a visual example of dynamic (congestion) pricing, I am

⁶ Interview lines: 19-23

unable to sufficiently describe the basic mechanics of HOT lanes. This is not a characteristic unique to Pat. The case study of Minnesota reveals that many people have to see an example of HOT lanes working (real footage or video simulation) in order to believe that it works. Nevertheless, I am confident that Pat's stated willingness to pay of \$10/45 minutes for travel time savings is accurate.

While Pat was unfamiliar with the term "road pricing", he deduced that it meant some sort of "per-use tolling" and correctly associated the term with a system in which "the consumer ... is the one who bears the price of the maintenance and stuff, so it's like gas taxes and stuff"(lines 90-91). When asked what objectives are typically behind tolling, Pat gives a very thorough response. Notice in his response that his immediate reaction (like most participants) is to think about paying for a specific project, but that after thinking more about it, he reasons out other objectives.

PAT: Well my initial reaction is to pay for the project, whatever they are tolling for. Umm. But it might be, if you think about it, depending on the, they might be, in certain instances like London being a prime example they are not exactly paying for anything, this idea to put the onus on the person to think about whether they really need to be there and therefore reduce congestion, green house gases, all this other stuff, how uh, it is debateable how much that affects the atmosphere in real terms, but I think, primarily it's to pay for whatever it is doing, or in lieu of that to reduce usage, or to force alternatives like using public transit. (lines 102-109)

Pat's response says nothing about his support or opposition to tolling. But his ability to identify the different objectives of tolling underscores the importance of knowing that his subsequent opinions will be based on an informed perspective and not misperceptions based on limited information. When the subject of tolling revenue comes up, Pat sees the potential in

funding big transit projects like light-rail, and the possibility of reducing the fuel tax, which he correctly points out is higher in the Metro Vancouver area than surrounding areas.

In talking more about the fuel tax, Pat identifies what becomes a critical finding of the study, the “disconnect” between using roads and paying for them, as illustrated in the following text:

MARK: What’s your perception of the nature of these charges, like when it’s built into a gas, like you know filling your car up, do you think there is an association there for most people between the price you are paying at the pump and what you are contributing to the road system?

PAT: No, I think there is a huge disconnect. For the average person you know is not like when they are pumping in they are like ‘oh look my gas tax is going to repaving the roads’...

MARK: Even though it is.

PAT: Even though it directly is, there is a correlation, you know cause and effect. The people, my sense is, they don’t see that. People are just so fixated on “oh god this is going to cost me an extra 2 cents, which they can’t get past... (lines 173-183)

Pat engaged well with the equity issues around different options, stating that while he would prefer time-of-day tolling because he passes his costs directly to his clients, he believes most people on the road do not have much choice in what time they start work, and would pay for the costs of tolling out of their wages. In light of this, he thinks a GPS-based distance charge would be the most equitable, and feasible “with the right education campaign” to develop public support. He also demonstrated a relatively high level of understanding of how roads are currently paid for, and believed that shifting the onus from property tax to road users is “a good idea”. (line 241)

The interview with Pat provided rich information about his perceptions of the costs of congestion and road pricing. He not only demonstrated the importance of how one's understanding of the problem informs their opposition and/or support of alternatives, his interview was the first to highlight the deeper issues of the fuel tax and its failure to inform drivers of the costs of using the roads. Pat's interview, along with the two that follow, signal a subtle yet important shift of focus in the interviewing techniques I evolved over the course of the project. While I continued to ask people their perceptions of the costs of congestion and the three road pricing alternatives, I became less focused on the specific responses in terms of support and or opposition, and more focused on people's ability to relate to the concepts at all. I also probed further into people's knowledge and thoughts about the fuel tax, transparency of costs, how roads are paid for and the consequences of the status quo approach to funding roads.

Interview #5

Participant: Beatrice

Municipality: Port Moody

I begin the interview by asking Beatrice to describe her driving patterns and how congestion affects her. She clarifies that she only drives to work (in Vancouver) if she “absolutely has to”. Most days, however, she drives to Burnaby and takes Skytrain from there in to Vancouver. Unlike the majority of participants, she first talks about the psychological toll driving takes on her, and then gets into the time costs of driving. For her, it's not just the “direct costs of driving and parking, which (are) prohibitive” (line 65); driving in congestion affects her ability to perform at work. She states: “after an hour and fifteen minutes of driving –through downtown especially- I need an hour to calm down before I am in a position where I can start working and writing cohesive emails. It's a very stressful commute...” (lines 28-30)

Beatrice's willingness to pay for travel-time savings in the HOT lane scenario is estimated to be ten dollars, based on a travel reduction time of 30 minutes. She acknowledges that if she drove every day, she would not likely use the HOT lane regularly due to the cumulative

cost. She also points out that compared with taking the train, driving is “completely unproductive”, and that “even cutting out half an hour of (her) commute wouldn’t make it any more productive”. In analysing the interview, however, it struck me that this comment is somewhat illogical. Surely the point of using (and paying for) a time saving alternative is to make different use of the time you would have otherwise spent in traffic. Perhaps what she meant to say was that even a short commute (when driving) is an unproductive one compared with the train. Contradictory statements like this underscore the importance of allowing the participant to contemplate their answer. The time given and the information presented and clarified in the interview process impacts a person’s ability to perceive what the benefit of travel-time savings in the context of driving actually means to them. Further, such comments illuminate the potential danger of conventional methodologies that use large surveys or telephone polls to understand public attitudes toward the costs of congestion and road pricing. Without sufficient context and a dynamic process between researcher and participant, attitudes about complex concepts can be easily misinterpreted.

Having emigrated from Europe when she was younger, Beatrice relates well to road pricing concepts from her past experience with road tolls. Of the three road pricing concepts, she prefers the system-wide tolling over HOT lanes and distance-based charging, primarily because “she has seen it before”. This is consistent with many of the responses in this study as well as others (see the Minnesota case study): people like options they are familiar with. She also notes the fact that North Americans pay a relatively small amount in fuel tax compared with Europeans.

It occurs to me that this fact may be at the root of another disconnect for residents of Metro Vancouver in understanding the problem of congestion. In discussing why people choose to drive, many participants referred to the fact that much of the region is not well served by transit. Many went on to mention Europe’s advanced network of trains and transit systems. Adopting a European-style system here, it was thought, would give people a viable alternative to

driving, and help with the mode shift so desired by provincial and municipal leaders.⁷ With the exception of Beatrice, no one in the sample mentioned the higher cost of driving in Europe. Few mentioned the cost savings of operating transit within a densely populated area. No one commented on how higher vehicle operating costs (taxes and tolls) might increase demand for transit, to say nothing of what higher fuel taxes and road tolls do to enable cities and states to fund such sophisticated transit networks. Perhaps people who advocate for “European-style” transit infrastructure should be asked whether they also support “European-style” taxes and charges on driving. This matters to the way we think about alternatives here, because if knowledge about European fuel taxes is lacking amongst Metro Vancouverites, we can begin to explain the disconnect between wanting an extensive transit network and paying relatively small amounts of fuel tax. Further research into this disconnect and how to effectively address it would be worthwhile.

Interview #6

Participant: Steve

Municipality: North Vancouver

Many of the participants in the study used a combination of driving and transit. But Steve was the only participant that commuted to work regularly on transit, driving only on weekends and for non-work related activities. Before he started working in downtown Vancouver, he used to commute every day by car to SFU in Burnaby. But because of the high price of parking downtown, he finds that “the bus works out really well” for him (line 12).

Steve was very reflective and open about his experiences driving. For him, the greatest loss was time, because it was time he “would rather spend working or with (his) family” (line 28). Like Beatrice, the inability to be productive while driving was a cost to Steve.

⁷ The Provincial Transit Plan “is aimed at increasing transit market share by 2.5 percent by 2020” (p.5)

After leading him through the HOT lane scenario, Steve states that \$10 “seems reasonable for half an hour”, although he admits he may not use it every day. Road pricing as a concept was not familiar to him, but in discussing the HOT lanes earlier in the interview, he pointed out that such a concept would “pay for the costs of roads a lot quicker”, which he found “interesting”(line 60).

Initially, Steve expresses opposition to the idea of tolling because, like many participants, he associates tolling with tollbooths, which “can cause congestion backups, especially around bridges where (it is) already congested” (lines 100-101). Once he hears about the standard practice of electronic tolling, he changes his opinion. In fact, he sees a benefit in reducing general taxes and having commuters pay more for to use the roads during congested times.

Toward the end, the interview with Steve—like many of the interviews with the public—moves into a discussion of status and the “car culture” that exists in North America. Much like some people avoid taking transit not because it is inconvenient but because of the perceived social stigma, people may choose to drive vehicles because of status it affords them, or as a way of communicating their material wellbeing to the world around them. Steve is the only participant, however, to raise the subject of intergenerational differences as it regards driving, status and the prioritization of disposable income.

MARK: ...but what role do you think car culture plays in our habit of driving and the way people see alternatives, do you think there is something there?

STEVE: Do you mean because people enjoy driving, people enjoy having their own car?

MARK: Yeah you know is there a status thing in driving, driving alone?

STEVE: I think there might be with the little bit older generation than us, you know the 40, 40 and above, you know they want to have their BMW in their private spot. I think you know when you get the 20's and 30s

people aren't as competitive in the car area... Whereas the older generation ...they've paid off their house or close to paying off their house they have disposable income, they have always had nice cars, and I think our generation we're more worried about real estate than anything. But definitely I have seen it; there are some people that just need to have a new Porsche every year. There is definitely some status there. I think it all comes down to economic groups and you know how much income you have leftover after you pay, but there is definitely a divide in terms of age... We have one car and it's like a \$20,000 Toyota, it's fine for us, it works great, I don't care, I don't supe it up or anything, just to get us from point A to point B and there is no status, I put no value on my car, it'. It's just to get me places and that's it. (lines 162-185)

It is likely that even within the younger generation attitudes toward driving vary depending on a variety of factors—access to transit being one. As it turns out, Steve's observation is shrewder than I first realize. I recall from my final public interview a comment by a woman from Langley named Jan.⁸ In a somewhat surprised and reflective tone, Jan talks about her daughter's choice to live a car-free lifestyle:

JAN: My daughter refuses to drive. She doesn't want to drive. She lives downtown and goes to university. She is just not interested. She says I am going to live in a city where I can just get on a bus. Just doesn't want the responsibility, the expense. And actually a number of her friends don't drive. I find that to be interesting. They just aren't interested. (lines 167-173 interview with Jan)

Of interest here is not the daughter's preference for a car-free lifestyle, but the difficulty her mother has in relating to her daughter's decision. The surprised tone with which she describes her daughter's choices is not obvious from the written text but clearly audible in the recording of

⁸ Langley's lack of transit options, as pointed out by both Mayor Fassbender and Mayor Green, is a problem, and goes some distance in explaining why "four car families" are not unusual in the municipality.

the interview. This is the intergenerational divide Steve is referring to. And if Steve is correct, as the younger generation ages, the population will increasingly be able to evaluate transportation funding alternatives from an efficiency perspective, rather than a culturally invested, status-bound perspective that, as Steve said, might exist with older generations of today.

Interview #7

Participant: Meryl

Municipality: West Vancouver

Meryl is a high school teacher at a school in South Vancouver, but commutes daily by car from West Vancouver, where she lives. She avoids the congestion of morning rush hour by leaving “around seven”, and does not consider this to be a sacrifice because she “enjoy(s) getting to school early and having quiet time (and) getting things done” (lines 85-86).

This helps explain why my attempt to elicit a dollar value of her willingness to pay for travel-time savings is unsuccessful. For her, a HOT lane alternative “wouldn’t be worth anything” (line 34), because she has already modified her trip time to avoid congestion delays, and at seemingly little cost to her wellbeing. Interestingly, though, Meryl was conscious of the fact that she had arrived late for the interview (which was done at her school) due to traffic on the Lions Gate Bridge. When I ask her later in the interview whether she would have paid the \$5 HOT lane charge to avoid the traffic on her way here she says: “No, I would not have paid the \$5, I would have left earlier to avoid the congestion. There is always work to do here (at school). I’d rather be here doing something than idling in traffic—it drives me around the bend”. Unfortunately, I missed the opportunity to ask Meryl about the value of trip reliability. This is precisely what Brownstone and Small point out in their paper (2005) on HOT lane use in California, when they say, “people display time inconsistency in their actual behavior, but not in their hypothetical behavior” (p. 288). In other words, despite the reality of being stuck in traffic on the way to our interview, she preferred to think of it in terms of what she “would” do, hypothetically. Ultimately, she says she would have paid the \$5 because she had agreed to meet me at a certain time. But,

given her current willingness to avoid congestion in the morning and her general comfort level with using transit (apparent in the rest of the interview), it is safe to say Meryl would not be a regular user of a HOT lane initiative in Metro Vancouver. Although it is highly unlikely, given that traffic “drives (her) around the bend”, that Meryl considers travel delays to be no cost to her, I recognize that my method of framing (and reframing) the question was insufficient to produce a reliable answer from Meryl. Accordingly, I estimate her dollar value of travel time savings to be zero.

Meryl is the first participant to try the “ future trade-offs game” I introduced into the interview schedule. Given the choice between a) higher taxes to build wider roads (accommodating more cars) and b) no increase in taxes but a requirement for all commuters to use transit or carpool one in every five work days, Meryl chooses the latter. The game is intended to illustrate the increased taxpayer costs of accommodating more single-occupancy vehicles during commuter hours, and Meryl appears to fully understand the trade-off between the two scenarios. She also demonstrates the capacity to think through the implications of building more roads, saying “when you build more roads you get more cars” and that such an approach would mean “everything would be a parking lot world, concrete” (lines 79 and 87).

Despite her opposition to HOT lanes, she supports the idea of system wide tolling if revenues could be used to improve bus service, “which would be wonderful” (line 130). But she also says that to support it she would “have to believe that they’d really go to that ...there would be a lot of cynicism”, she says (line 136). Meryl’s comments on the costs of taking transit versus driving into downtown Vancouver are also intriguing.

MERYL: I get really upset when... I met some friends at the art gallery. We talked about what they paid to get there. It would have cost me over three dollars to get there and over three dollars to get home (on transit). Well I drove over and it took me 10 minutes to get there and I parked for 4

dollars. So at this point it would have been a financial burden as well as everything else to take the bus. (lines 167-172)

Notice she separates the financial costs of the two alternatives from “everything else”, which in this case appear to be the difference in time savings.⁹ The cost comparison she makes is between the full cost of transit (over \$6.00) and the parking and perhaps the cost of gas, which she would have to be estimating at \$2.00 or less in order to be combined with the parking costs and still be less of “a financial burden”. What she has not included in her assessment of the cost of driving are the fixed costs of buying, maintaining, and insuring the vehicle she uses. It is understandable that she does not think of these as “trip” related costs, because they are already paid for whether she takes the trip or not. This points to the policy implications of the status quo – at least in terms of how the province structures insurance premiums and registration: as long as people are increasing the value of owning and insuring a car by using it, drivers will not consider the full cost of driving when comparing it with transit, whose entire cost is built into the trip. Once someone buys and insures a car, they are in fact maximizing the utility of their investment by using it. Perhaps that seems obvious. But less obvious, I would argue, is that a provincial policy is the driving force behind that process of citizens “maximizing their utility of car ownership”. More car use means more road use. So in sum, we have one provincial policy, which encourages people to drive, that contradicts the policy objectives outlined in the BC Transit Plan of encouraging people to use more sustainable modes of transportation. Ultimately, it would be wrong to assume that the province’s “fixed cost” policy approach is the only approach, as it would to ignore the associated costs of building roads to accommodate the increased driving that results from the current policy. As it turns out, Meryl’s choice to drive rather than take transit to meet her friends is completely rational, from an economic perspective; but it is only rational

⁹ It is difficult to say how Meryl defines “the 10 minute trip” from West Vancouver downtown Vancouver. It is unlikely she was counting the time it took to park and walk to her destination, but I never followed-up on this, unfortunately.

because of the policies we have chosen regarding the insurance and registration of vehicles and the way we pay for roads.

Interview #8

Participant: Melvin

Municipality: Port Moody

Melvin is a young professional living in Port Moody and working full time in Richmond. His working hours are flexible enough to accommodate a late start and finish time, which means he can avoid the worst of the morning rush hour in his commute. In terms of driving, he saves about an hour a day in travel time due to his ability to start work at 10am. That time savings is smaller though when he uses transit. Melvin, like Beatrice and others in the sample, uses a vehicle as well as transit for his transportation needs.

Melvin finds driving in traffic “pretty stressful” and “unpleasant” (line 3), although, compared with the significantly longer transit trip, the cost of driving and the stress of traffic delays are worth it. He is familiar with some of the road pricing concepts, such as HOT lanes and the London congestion charge,¹⁰ and his willingness to pay for time savings in the HOT lane scenario I present to him is influenced by the fact that he already uses transit, and therefore considers it a viable option. Perhaps this in part explains the relatively low value he places on time savings in the context of a HOT lane alternative (four dollars for 30 minutes). Although, he admits his willingness to pay would be much higher (\$10) if he were faced with being late for an appointment. I use his stated value of four dollars for 30 minutes because my goal is to understand the public’s value of time savings under planned travel circumstances, not what people do when faced with unforeseen pressures.

After interviewing Meryl, I am better prepared to engage Melvin in discussing the way costs are perceived when choosing to drive versus use transit. Melvin is quick to point out that

¹⁰ Melvin had just finished reading David Owen’s *Green Metropolis*, and at times made me wonder whether he shouldn’t be the one conducting the interview.

“the true cost of driving is a little more distributed versus transit, which is all up front” (line 8). He is also aware that the price of transit fare only covers a portion of the true cost of providing the service.

When presented with the two choices in the “future trade-offs game”, Melvin also prefers the “efficiency” option of taking transit or car-pooling every fifth commuter trip. This is not surprising given the fact that he now uses transit to get to work. Like many other participants, he doesn’t “see the (alternative) ever getting implemented. There would be riots if you told people they had to carpool or transit” (line 23). Again, his response is fair considering I have not indicated *how* the required mode shift would take place. When I explain that pricing the roads induces some people to move to transit and carpooling, he agrees, but maintains that “people would take offence” (line 59) to such a policy. He does equate theoretical benefits with a congestion pricing scheme for Metro Vancouver, primarily in terms of less congestion. But he has social equity concerns. He says: “in reality all I can see is a sea of Mercedes and BMWs screaming along” (line 54).

The conversation eventually comes back to subject of transparency of costs.

MARK: Do you think the government does an adequate job of making the costs of driving, or the cost of supplying the roads for driving, of making those costs clear?

MELVIN: No, not at all. There is never any, you know you hear all about when TransLink is levying a new property tax, that hits the news everywhere but there is no notion that when the government spits out a billion dollars for a new super highway or bridge, there is no notion that you are paying for that, there is no connection. So people take it that roads are a right and transit is fluffy crap that we all have to pay for. So I don’t think it’s that clear at all.

MARK: Is there a perception that roads are free?

MELVIN: Yeah, people have expectations about roads and the quality of roads, like if there are potholes in the roads, that's a no-no. But transit is expendable and roads are essential.

If it is true that the public sees the road network as a given rather than a service on which investment levels must be decided, it is understandable that the public may have difficulty conceiving of policies such as road pricing that signal a different way of determining: how much road space is enough, and who should pay for it. In terms of evaluating the three different road pricing schemes, Melvin sees the GPS-based distance charge as the most viable. Although, for it to be effective in changing people's travel behaviours, he believes the cost would have to be substantial.

Interview #9

Participant: Shirin

Municipality: Richmond

Of all the interviews with the public, my interview with Shirin contains possibly the richest material. It is clear from the beginning that Shirin is eager to talk about the subject of congestion, driving and transportation issues, and their impacts on the environment and health. She also addresses the problem governments have communicating with the public and influencing peoples to make "good" decisions, what some academics refer to as "libertarian paternalism".

Shirin is a frequent driver, commuting from Richmond to Burnaby, Monday to Friday. By leaving a littler earlier, she can reduce her trip from 45 minutes to 35 on the way to work, but coming home is predictably slower, which means an extra 20 minutes stuck in traffic. She finds congestion on the way to work makes her "a little more anxious", but going home, "it doesn't bother (her) at all" (line 62, 64).

To estimate her willingness to pay for travel-time savings, I ask her whether using a congestion-free HOT lane would be worth \$5 to save the 10 minutes of delay she currently experiences. Interestingly, she says:

SHIRIN: No

MARK: So the benefit of saving that \$5 is higher than being out of the congestion saving that...

SHIRIN Right, but if you are looking at time, time as the mitigating factor on why I would go there? No. I never thought I would say this but I really like the commute. From home I can get into my workspace by the time I am here, and actually I decompress when I go back home. I really sort of like that space. I would feel like, a) it would be the money: I am frugal, I don't think I would pay that. But if it meant I was polluting less because I was in my car less, that might be more of a deciding factor. But the time? I don't know if I want to speed up my day anymore (*sighs reflectively*). I don't know if I really want to *get* somewhere that much *faster*. Do you know what I mean?

MARK: Yep, oh yeah...

SHIRIN: I would rather walk somewhere, give myself another hour to walk down to the stores, shop locally, than to get somewhere faster. (lines 48-59)

There is much in this quote to ponder. The only stated value Shirin associates with the congestion reduction option is that she would be “polluting less”. Presumably, considering she sees herself as “frugal”, the savings in gas from less idling would be a benefit, but it's not clear whether she had factored that in. Despite her earlier reference to the “anxiety” that traffic congestion causes her, there appears to be something about the slower tempo of traffic congestion that she enjoys. She also seems to associate the free flowing traffic of the hypothetical HOT lane with rushing or speeding. In retrospect, one would think that if her motivations were: frugality, the environment, and slowing down her day, she would take transit.¹¹ There is likely much more to Shirin's motivations that I am not able to capture in the interview. The apparent contradictions of her answers may, to some degree, be explained by the human tendency to justify one's actions.

¹¹ Shirin's office, where the interview took place, was a three-minute walk from Lougheed Skytrain station.

Having spoken with a number of people at this point in my research about how decisions are made when it comes to travel, it is also my theory that habit is a primary factor in what people “choose” on a daily basis. In other words, if people do not perceive there to be a “choice” on a daily basis, they will likely do what they did the day before. A significant and abrupt change (like the huge number of people who took public transit during the Vancouver 2010 Games) may bring about a review of “the choices”. But congestion delays, fuel prices and environmental concerns about driving tend to change incrementally and seem well outside any one person’s control.

Later, I reframe the question about willingness to pay by asking her to imagine the congestion getting much worse on her commute. She states she would be willing to pay \$5 to avoid 60 minutes of congestion and compares that cost to taking transit. Like Meryl, she excludes the operating cost of her vehicle in the comparison. Unlike Meryl, she overestimates the cost of taking transit by double, claiming it would cost her \$200 per month for a pass that actually costs \$99 (two-zones unlimited travel). Perhaps this helps explain why, in spite of her stated priorities earlier, she does not see transit as a worthwhile option. It also recalls the question posed at the beginning of the study over how information affects people’s decisions and opinions. The evolving conclusion here is that the provincial and municipal governments would be wise to improve the communication of information to drivers so they can make more informed choices as consumers, taxpayers as well as commuters.

Shirin also makes clear what she sees as a growing disconnect between citizens and the government when it comes to understanding taxes and government spending.

SHIRIN: Well, in general, I laugh when I hear people say “THE GOVERNMENT” is taking all our money and spending more taxes and “THE GOVERNMENT” –wait a minute, that’s our money, it doesn’t go into a black hole it goes into hospitals, it goes into infrastructure, transit. And I think that people do not understand the connection in general.

MARK: Why is that happening?

SHIRIN: Again, whether or not the government just doesn't do a good enough job of communicating that, that this is what your tax dollars are really paying for I don't think they have that connection. They don't see that their money is really supporting any infrastructure thing.

MARK Right, yeah,

SHIRIN: So the simple answer is: No. I don't think they understand that it is their money, through tax dollars, that are maintaining the systems.

MARK: Yeah, I see a disconnect there too.

SHIRIN: Yeah definitely... It's the same when you go to the doctor's office. You don't get a receipt. You know this is what it cost... yeah, there is a real disconnect, we think that driving on the roads is free! It isn't!

MARK: Right.

SHIRIN But I think that if we knew where our tax dollars were really being used... just to inform people.

MARK Yeah, I think you might be on to something there.

Clearly, Shirin's believes more has to be done to improve the public's understanding of how tax dollars are spent. We conclude the interview with a short discussion on the different road pricing options. Shirin is "not convinced that whacking somebody over the head with a big stick" (line 203) is the way to change behaviours. Knowing Shirin works in health and wellness, I suggest that a road tax for single occupancy drivers might be akin to raising the price of unhealthy foods because of the associated costs of poor diets on our public health care system. She agrees that "that would benefit it", but as far as driving is concerned, she is not sure the "penalty approach" is going to stop people from "doing what they want to do or think they need to do" (Line 221, 229-230). It is difficult to say why she draws this line between health and the

analogy of road pricing. At this point in the study, it is apparent that the idea of road pricing is such a departure from the way people normally conceive of paying for roads that it takes more than a 30 minute conversation to fully develop an idea of the potential benefits and issues around fairness inherent in road pricing schemes.

Interview #10

Participant: Jan

Municipality: Langley

My final interview is with Jan, a college teacher from Langley. Jan typically commutes “between four and five days” per week to Vancouver where she teaches college and university classes. She drives most of the time but occasionally uses transit if she is travelling all the way to UBC. Jan has already adjusted the time of her outgoing trip to avoid the worst of the peak congestion. Still, what should take 45 minutes takes over an hour. It is worse going home: it takes 90 minutes to do the same trip—more if she leaves after 2:30pm. Jan is the only participant that talks about the congestion delays in driving her children to school. Her explanation for the congestion is first: construction; second: the number of traffic lights; and third: volume. In describing her experience and thoughts on the costs of congestion, she notes both the environmental cost and time. Asking her whether the extra gas costs from idling are important to her, she says “yeah!” and then, thinking about it more, adds the cost of “breaking” and “stopping”, which I interpret to be the added costs of wear-and-tear on the vehicle.

I introduce the HOT lane concept to her and ask her whether she would be willing to pay \$10 to cut out 30 minutes of delay from her trip. She says yes, but only as “an option ...if I had to get home or pick somebody up to do something” (lines 47-48). It becomes clear later in the interview that I should have given Jan more time to think about what this would mean for her morning schedule. As she ponders the impact of a congestion toll, I ask her whether leaving at 7:15am (rather than 6am) would be worth something. From her reaction, I believe the benefits of road pricing occurred to her for the first time: “That would be great! (laughing). That would mean

not getting up at five in the morning, which is really hard to do! ...yeah, I would look at that for sure if that were an option” (lines 116-118). As I analyse Jan’s interview transcript, I wonder how many other participants would have spoken more about what it would mean to them to travel without delay had I given more time for them to reflect as I did with Jan.

In discussing the time and costs of transit versus driving, Jan, like other participants, misremembers the time it takes her to drive. Recall that her stated time for returning by vehicle was 90 minutes. When she explains later why she doesn’t take transit, it is because it would take “two hours” which she states is “a whole extra hour” more than it would be driving. A miscalculation of 30 minutes may seem insignificant, especially given the nature of driving, which tends to vary from day to day. But as I show in the first section of each interview, travel-time savings is of considerable value to people. Overestimating the difference in travel time between the two modes therefore has two significant implications: First, in collective terms, the significance of that miscalculation is substantial. Second, where driving culture is dominant, such miscalculations are reinforced through widespread misconceptions about the feasibility of transit and alternatives.

I suspect the trip time predictability of transit and the uncertainty of driving also play into the phenomenon of trip time overestimation. Transit runs on predetermined schedules, so users know in advance how long the trip is likely to take. Driving time—especially in an SOV scenario—is more prone to variation. Drivers therefore always stand to benefit (at least psychologically) from the possibility of their travel time being on the lower end of that variation. The same can be said for the transparency of costs: people know the full (private) cost of a transit trip; drivers are only able to know what the cost of a trip is once annual gas and operation costs are divided by the kilometres driven, the calculation for which is complicated by multiple users of a vehicle, or passengers within one trip. Taken together, the transparency of trip time and trip cost will tend to make transit less attractive than driving, which always holds the promise of a faster

trip time, and its full cost obscured by annual (insurance) and unpredictable (maintenance) payments.

We move to the subject of how roads are paid for, and her perceptions of current fuel tax. Like most participants, there is very little connection for Jan between buying gas and paying into the transportation system.

MARK: ...right now the way we pay for roads comes through the gas tax. I am interested in people's perceptions of where that tax goes, what it is spent on...

JAN: I don't know. I don't know exactly. I kind of sense that, um, that it's a lot of tax. I don't know if some of it goes to transit. I thought some of it went to fix roads.

MARK: Would you say there is a sense that, when you fill up, that you are paying for the roads when you fill up, or is that a bit of a stretch, that connection?

JAN: I don't even think about that. It's just gassin' up the car. I need gas to get to where I am going... (126-135)

Jan's response reinforces the central finding of this study: drivers have a very weak connection between using roads and paying for them because the payment vehicle is obscured by the larger cost of fuel and the immediate need to fuel-up so you can "get to where (you) are going".

Jan is the only participant to express serious concerns about the privacy implications of a GPS-based distance charge. She finds the idea of being watched as to where she drives "a bit creepy". I elect not to further the discussion on privacy in part due to her strong response.

Ultimately, she prefers a tolling alternative to the other road pricing options, although it is clear she relates to the HOT lane concept as well.

3.1 Data Summary and Conclusions

Table 1: Participant Characteristics and Willingness to Pay Matrix

Participant	Municipality	Peak-hour commuter	Travel Mode	WTP for time savings	Hourly rate
Mic	Richmond	Yes	SOV	\$10.00/ 40 min	\$15.00
Nanti	Coquitlam	Sometimes	SOV	\$7.50/ 30 min	\$15.00
Kevin	Abbotsford	Sometimes	SOV, some carpooling	\$10.00/ 45 min	\$13.33
Pat	Surrey	Yes	SOV	\$10.00/ 45 min	\$13.33
Steve	North Vancouver	Yes	Transit	\$10.00/ 30 min	\$20
Beatrice	Port Moody	Yes	SOV and transit	\$10.00/ 30 min	\$20
Meryl	West Vancouver	Yes	SOV, some carpooling	\$0	\$0
Melvin	Port Moody	Yes	Transit	\$4.00/30 min	\$8
Shirin	Richmond	Yes	SOV	\$10/60 min	\$10
Jennifer	Langley	Sometimes	SOV, some transit	\$10.00/ 30 min	\$20

The above table provides a summary view of the key characteristics of the ten participants from the public (municipality, travel time, mode) and their stated willingness to pay for travel time savings (respectively). The “hourly rate” shows how a HOT lane priced at \$5.50 (for 30 minute savings), would be used by some but not all of the travellers. Meryl, Shirin and Melvin would consider themselves better off spending the hour in traffic. Kevin, Mic, Nanti and Pat would likely use it, but be making a roughly equal trade between time savings and financial wellbeing. Steve, Beatrice and Jennifer would use the HOT lane and consider themselves much

better off in light of their relatively high value for travel time savings. In other words, they would be willing to pay \$10 for the 30-minute delay reduction, but they only have to pay \$5.50.

Where the WTP values on their own fall short, the qualitative data from the interviews allows us to see how other congestion pricing schemes (such as system wide tolling) would likely impact travel behaviors. Consider a peak hour toll of \$5.50 (for 30-minute travel delay reduction) that applied only to SOV drivers. The participants' willingness to pay becomes less important than other decision-making factors. Because the benefits of congestion pricing only come as a result of behavioral shifts (leaving earlier or later to avoid peak times, or moving from SOV travel to HOV modes), the most important factor is: how many people would change their travel behavior, and how would that impact their wellbeing?

Take Melvin, for example. Early in the interview, he mentioned that he had recently switched from driving (SOV) to taking transit to work, not because it was cheaper, or faster, but because he could be more productive with his time. Had a system wide toll come into effect while Melvin was still driving, it is safe to say that switching to transit would not have been a major cost to him, because he did it eventually even in the absence of a congestion charge. Despite her higher value of travel time savings, Shirin would also be likely to move to transit if faced with a daily charge. Motivated by the environmental benefits of transit, a desire to slow down her day, and the fact that she values being frugal, it could be assumed with some confidence that moving from SOV to transit would not come at a great cost to Shirin, especially once she discovers that a transit pass is only half as much as she believes it to be. Mic, to take use a different example, would likely continue driving, not just because of his relatively high value of time savings, but because from his perspective "people wouldn't drive less, (a toll) would just lead to more frustration". Mic is not wrong; some people would find a toll frustrating with or without reasonable alternatives. But clearly, from the content of the interviews with other participants, people are not as inflexible as Mic believes. And some of his expected frustration with a

mandatory toll would no doubt diminish once he experienced the reduced travel time of his commute as a result of some of his fellow commuters' behavioral changes.

The overarching point here is not to be able to say: "given a congestion toll of \$5.50, x number of people would move to other modes or times". Rather, I use the above examples to illustrate that people are more complex than surveys—or even interviews—make them out to be. I use the above examples to highlight the fact that dollar values for time savings say very little about the complex nature of decision-making (Melvin), how people's wellbeing might change with new information (Shirin), or how people's beliefs limit what they think is possible within a community of people (Mic).

Summary of Key Findings from Interviews with the Public

It is important to rearticulate that the findings presented here are not statistically significant, nor are they representative of the larger Metro Vancouver public. They do however provide insight into a variety of potentially useful information about the way people think about congestion, the costs of driving, and what sorts of changes to the road funding system would be supported by the public. Further, because a number of barriers were identified to understanding the costs of driving and congestion pricing concepts, policy makers should be better able to strategize public engagement efforts such that they address the core obstacles to understanding congestion pricing alternatives. The following themes have been identified from the analyses of the interviews with the public:

- Participants relate well to costs but not benefits of congestion pricing; scepticism decreases with more information; support for road pricing increases with information;
- SOV participants often underestimate costs of driving—both the private and external (taxpayer) costs—and overestimate the costs and time of transit.
- Transparency of public and private costs of driving is weak under current policies;

- Participants' understanding of road pricing objectives was weak at the start of the interview;
- Key misperceptions around tolling: they are inefficient due to tollbooths (delay); they are only used to pay for infrastructure and/or generate revenue;
- Elasticity of demand for road space: numerous participants were doubtful that an increase in cost would lead to less driving in aggregate, and one participant thought there is no relationship at all –in other words, demand is completely inelastic;
- The current system of paying for road use through the fuel tax results in drivers having a weak connection between road use and the cost of supplying roads;
- A common response to congestion pricing was “it makes sense, but I don't think other people will support it”, which contradicts the fact that most people in the sample showed support for it;
- Support for road pricing increases with an expected decrease in the fuel tax.

3.2 Results from Key Informant Interviews

This section briefly describes the results of the interviews with the key stakeholders. As the primary purpose of these interviews was to have decision makers and stakeholders provide comments on the proposed policy options, more discussion of the interviews is found in the policy evaluations section near the end of the paper.

There was generally a strong interest from all stakeholders and mayors in the subject of the paper. Participants were told in advance that I would require 25-30 minutes of their time. However, there was not one interview that lasted less than 40 minutes; most were closer to an hour. The mayors in particular were anxious to discuss transportation problems (especially transit) and the challenges of engaging citizens to understand the complexities of transportation issues.

Interviews with stakeholders revealed a broad spectrum of experience with and awareness of road pricing issues. Jon Garson, from the BC Chamber of Commerce, demonstrated

a remarkable capacity to articulate the problems with the current approach to funding the road network, as well as the perception and education issues with the public that will have to be addressed before decision makers can consider different congestion management alternatives. All four stakeholders provided comments and concerns about the policy options proposed later in the paper.

The three interviews with Metro Vancouver mayors revealed a number of common concerns (lack of transit alternatives) as well as individual areas of concern. Mayor Rick Green focused primarily on intergovernmental issues (governance structure of TransLink, inequities of transit levies) as well as his perception of the fundamental problem with bringing road pricing into the region: insufficient transit alternatives in his municipality. By the end of the interview, I was able to communicate that my research objectives were not to implement road pricing, but rather to engage the public more broadly on the subject of the costs of driving and congestion, and to generate awareness on the different alternatives to the status quo. Mayor Green was ultimately very supportive of the policy alternatives, noting that he makes a point of communicating with the public through casual town hall meetings, which from his perspective is not done enough in municipal politics.

Mayor Fassbender was keen to talk about the importance of communication strategies in educating the public. He related the story of the federal Conservatives' communication efforts to inform the public of the benefits of the GST to the challenge road pricing advocates have in getting the public to understand the benefits of a road tax. Many of Mayor Fassbender's comments and suggestions aligned with the findings from the case study of communication efforts in Minnesota.

By contrast, Mayor Daykin focused on the challenge of getting voters to understand the tradeoffs of allocating scarce public dollars. While the lack of transit alternatives in Maple Ridge was a concern, Mayor Daykin thoroughly engaged in the cost transparency issues of the research.

Maple Ridge being the primary beneficiary of the new tolled facility, the Golden Ears Bridge, the Mayor had direct experience with how his constituents dealt with the choice between using the tolled facility, and using the “free” alternative (which adds a minimum of 30 minutes to the trip each way). That people rarely mention the added cost of gas in taking the “free” alternative was further evidence that people’s decision to drive may be influenced by the way in which they are confronted by the costs.

4: Case Study: Road Pricing in Minnesota

As described in the section on methodology, the phenomenon under examination is “effective public outreach practices” in the context of transportation policy and planning. Again, the rationale for developing effective communication and outreach with the public is based on two underlying principles: First, the public (including stakeholders) pays for and benefits from roads and transit services; Second, no matter how effective the proposed transportation policy might be (cost effective, equitable, addresses externalities such as health and environmental consequences), without public support, major initiatives will not be embraced at the political level. This is evident from every key-informant interview conducted in this study.

If politicians determine that the public is reasonably well informed on an issue (this can be done through polling) and the response to the policy (such as congestion charging) is negative, then government must accept that response. But if the public’s opposition to a policy is based on incomplete information, government has a responsibility to inform the public so that a decision can be based on an informed response. This problem is sometimes referred to as “bounded rationality”, that individuals’ preferences are never based on perfect or complete information. But the degree of ignorance the public may have can vary. And where ignorance is identifiably severe, there is a strong imperative for government to facilitate understanding. The data collected from the public interviews in this study is not sufficient to generalize about the public at large. The interviews do, however, create a narrative about the public’s understanding of costs of congestion and driving. That narrative suggests that the public’s understanding may be extremely poor.

Accordingly, and as supported by the interviews with the local mayors, there is a strong imperative to create a more informed public about transportation issues in general, and road-use

specifically. The question is: how do we do it? Clearly, some sort of communication strategy or public outreach campaign is in order, but how can we ensure its effectiveness? The Minnesota case study addresses that question by examining the phenomenon of public outreach in the context of transportation planning and road pricing initiatives.

4.1 Minnesota

While experience with road pricing is limited in the United States, certain metropolitan centres, such as the Twin Cities region in Minnesota, have been working with congestion management initiatives for some time. The case study of Minnesota applies well to Metro Vancouver because not only do the two metropolitan areas share a number of geographical and political characteristics, the two transportation authorities—TransLink in Vancouver and Minnesota Department of Transportation (Mn/DOT) in Minnesota—also share similar experiences with the challenges of long term planning under funding shortfall scenarios. After a brief section that provides some context on Minnesota, I present and analyse the Department of Transportation’s efforts at public outreach and engagement.

The story of road pricing initiatives and public outreach in Minnesota is a useful one to any region looking to build an effective public outreach strategy for road pricing. This is not just because the Minnesotan proponents of road pricing managed to develop enough public support to bring about successful implementation of road pricing initiatives; they were successful, perhaps, because they first failed. As I present the various “lessons from Minnesota”, it should not be overlooked that many of these lessons were borne from a very difficult and long process, one with as many failures as successes.

Background

As demand for road space in the Twin Cities (Minneapolis and St. Paul) outpaced funding through the early 1990s, Mn/DOT began to look at the feasibility of road pricing (or

value pricing) as a means to manage demand and fund important transportation projects (Lari and Buckeye, 1996). But early initiatives were met with strong public and stakeholder opposition. For example, a 1996 proposal from Minnesota Department of Transportation (MnDOT) to build a toll road on Highway 212 was blocked due to local opposition to the project. A subsequent proposal to convert an HOV lane to a HOT lane met a similar response, prompting then-MnDOT commissioner James Denn to withdraw the proposal and comment, “I do not believe the proposed I-394 demonstration project enjoys the level of public understanding that is necessary for it to receive the objective analysis and fair consideration we seek” (p. 164, Munnich and Loveland, 2005).

After numerous unsuccessful attempts to implement different congestion pricing projects, MnDOT and local road pricing proponents revised their public outreach strategy in 2001. With the help of the Humphrey Institute’s State and Local Policy Program, and using the lessons from the first attempts at public education and outreach, MnDOT’s 2003 initiative, MnPass, on the I-394, was successful. How did this group of congestion pricing proponents “develop the public understanding (necessary for) objective analysis and fair consideration”? The following lessons provide a number of answers.

4.2 Specific Lessons from Minnesota

From the start, MnDOT’s efforts to enhance the public’s understanding of various road pricing concepts were undertaken with a coalition of support from the Federal Department of Transportation in the form of a grant, as well as multiple groups and transportation leaders. The story of the coalition’s successes and failures are documented in Munnich and Loveland’s 2005 article, “Minnesota’s Lessons Learned”.

Political Champions and “Grasstops” Coalitions

The backing of high-speed rail initiatives in the US by president Barack Obama and governor Arnold Schwarzenegger of California demonstrates not only the momentum high-level champions can bring to large transportation projects but what might be described more accurately as the *necessity* of top-level champions in such projects’ successful implementation. The same was true for congestion pricing in Minnesota. For eight years, the coalition had struggled to win broad based support for the public outreach initiative. But with the eventual support of the governor, allies were formed through the state transportation department, as well as the public, private and non-profit sectors. The governor was able to use his communications platform to “thoroughly explain the issue to sceptical stakeholders and citizens” (p.165, *ibid*).

Rather than target a “grassroots” coalition of citizens, the congestion pricing proponents developed a strategy to build relationships with community leaders and stakeholders capable of influencing the top legislative leaders. This approach, sometimes referred to as a “grasstops” approach, was instrumental in garnering the support of the governor. Once the governor backed the initiative, an effective communications and outreach campaign could begin with the public.

Visual Learning is Key

As I learned from interviewing the public about road pricing and potential solutions to congestion, people have a difficult time fully understanding how congestion (or value) pricing works, particularly how variable (or time-of-day) pricing can keep tolled lanes from becoming congested. The outreach coalition in Minnesota found that, “for many, value pricing literally has to be seen to be believed” (p.167, *ibid*). So the coalition made efforts to explain congestion pricing to the public with visual aides rather than strictly verbal explanations. Short videos and photo-intensive PowerPoint presentations, as well as interviews showing how “real” people respond to congestion pricing projects in California were cornerstones of information sessions with the public.

Nongovernmental Facilitator Is Valuable

In retrospect, it is thought that because the public outreach activities were organized by the University of Minnesota's Humphrey Institute the public may have been more willing to participate than if a government agency had been "the face" of the outreach efforts. This supports the findings of my interviews with Metro Vancouver mayors and stakeholders, which suggest that public sentiments toward TransLink are negative, and that any consultation over road pricing should be led by a more neutral body. This commonality between Metro Vancouver and Minnesota points to a larger problem of the public's distrust and disengagement from government, a subject that came up repeatedly in both my interviews with the public and the mayors. The policy options presented later in the paper all contribute (to varying degrees) to improving transparency between government and the public, which can be a starting point for reducing distrust and disengagement.

Preparation Before Media Promotion

Often, public education and outreach initiatives include a media campaign from the outset. The outreach coalition in Minnesota learned from early experiences that "seeking news coverage prematurely can be problematic" (p.166, *ibid*). For the upcoming MnPass proposal, they prepared three important communication tools before approaching the press: "diverse and credible messengers, visual tools to explain the concept, and detailed answers to all potential questions from the public" (p.166, *ibid*). By anticipating questions and opposition from the public, they were better able to address concerns, which in turn left stakeholders and members of the public more confident in the proposal. The absence of visual explanations in earlier outreach efforts was known to have negatively impacted the process. With the media able to easily access video and other visual tools for explaining congestion pricing, they became an effective agent in the coalition's task of educating the public on the complex subject of congestion pricing. The

“credible messengers” referred to above were likely the “grasstops” coalition of community leaders and organizations that were cultivated, as well as higher-level political figures.

The coalition’s communication strategy changed from previous attempts in another important way. Earlier efforts focussed on a set of universal messages that would “communicate the merits of the concept to the general public” (p. 166, *ibid*). The coalition eventually abandoned the “one-size-fits all” approach and focused on customizing messages for different audiences. For conservatives, the market mechanisms of the concept were emphasized. The message to liberals, transit advocates, and environmentalists focused on “equity, environmental benefits, choice, and the potential for improving transit” (p. 167, *ibid*). Should Metro Vancouver decision makers consider some form of congestion pricing, a similar communications strategy could play an important role in public engagement and education.

Task Force as Trust Building and Educational Tool

One of the core activities of the outreach coalition was to form a task force to bring together elected officials, business groups, environmentalists and transportation advocates of all stripes. Spread throughout a year, four half-day forums were held so participants could learn about the objectives and technical details of the upcoming congestion pricing proposal. The forums were conducted in an “open, inclusive, and fair manner” which helped “open dialogues and build trust within a diverse group (p.166, *ibid*).

4.3 Applicability to Metro Vancouver and the province

The case study of Minnesota and the state's congestion pricing coalition's decade-long experience in communicating and educating the public provides many useful lessons for Metro Vancouver and raises others for further consideration. As Munnich and Loveland point out, the lessons learned in Minnesota are not universal lessons that will fit all cases. "Each public outreach initiative has to be tailored to fit local circumstances" (p. 167, *ibid*).

Metro Vancouver today is not unlike the Twin Cities region of Minnesota of the early 1990s when the idea of congestion pricing was poorly understood by the public, and few political champions existed. A critical difference, however, is that in Minnesota's case the state department of transportation was, from the beginning, leading the effort. No such support exists in British Columbia, in part because, under the provincial "*guidelines for tolling*", the Ministry of Transportation and Infrastructure (MOTI) is unable to put forward a proposal.

More information on how the Minnesota coalition managed to unite the two major political parties (Republicans and Democrats) on the issue would be instructive. Unfortunately, because of its complexity, congestion pricing is easily misconstrued by groups looking to win the support of an uninformed public. The carbon tax brought in by the provincial Liberals in 2008 is a good example of this. Despite the official opposition supporting the objective of reducing carbon emissions, they strongly opposed the vehicle of the carbon tax in favour of a much more complex system of cap-and-trade. How complex policy goals such as road pricing can be pursued without the interference of partisan politics is a subject worthy of more investigation.

Certain lessons from Minnesota are instructive to those in Metro Vancouver interested in developing public understanding of road pricing. A non-governmental body, such as the University of Minnesota's Humphrey Institute (in the case of Minnesota), would be preferable for the facilitation of outreach and education in Metro Vancouver. The SFU Centre for Public Policy Research, or UBC's School of Community and Regional Planning might be alternatives. But

based on information from the interviews I conducted with Metro Vancouver mayors and stakeholders, a college or university outside the city of Vancouver, but within the Metro Vancouver boundaries, would be a better choice. Locating the task force in a municipality south of the Fraser would send the important message that these municipalities are not peripheral, but rather play a central role in the outreach process and public engagement process.

Another important lesson for the Metro Vancouver context is that congestion pricing messages have to be tailored in order to generate interest and learning among diverse groups. The general awareness that exists in the Metro Vancouver area regarding environmental issues and protection is considerable. But for congestion pricing to be understood in terms of its environmental benefits, an effective communication strategy would be necessary. Interestingly, a number of participants in my interviews with the public supported the idea of congestion tolling more for its potential environmental benefits than for the personal benefits of reduced travel time or for its potential to improve transit funding. Between the already existing support for congestion pricing from the Trucking Association and the BC Chamber of Commerce, and the natural alignment of environmental objectives with congestion pricing for powerful environmental groups like the Suzuki Foundation, a broad based coalition of support for road pricing is possible in Metro Vancouver; but the timing and messaging of the outreach effort has to be undertaken strategically, as the story of outreach efforts in Minnesota clearly demonstrate.

4.4 Effective Public Outreach: Outcomes Versus Process

As I learned more about the efforts of MnDOT and the congestion pricing coalition in Minnesota, I realized that their efforts to educate the public were motivated by a single policy goal: the successful adoption of a road pricing proposal known as MnPass. To achieve the goal, the education efforts were grounded in public relations and communications strategies.

To re-emphasize the objective of this paper, my goal is not to understand how to educate the public for the purpose of successfully implementing a particular strategy. Rather, it is to engage the public in ways that allow them to better understand the costs and benefits of the status quo approach, and the alternatives that exist to congestion management. To balance the public relations approach of the Minnesota case, I felt it would be useful to draw on more general lessons in effective public outreach approaches in order to think not only in terms of policy outcomes but also in terms of policy process.

To that end, I incorporate findings from a national UK study that reviewed different transportation authorities' efforts to engage the public in transport planning decisions (Bickerstaff et al., 2001). The study was not concerned with outreach for the sake of a particular policy goal; rather, it sought to examine the public's experience of consultation to determine its impact on both policy outcomes and non-policy outcomes. The study involved 71% of the local transport authorities (nation-wide) and used surveys to elicit responses from transportation authority officers and public participants involved in outreach initiatives.

The approaches to public outreach varied from simplistic information-based communication efforts to more innovative and complex discursive methods of engagement. Of the former category, "consumer oriented methods" such as complaints or suggestion schemes or service-satisfaction surveys were common. The study documents key problems encountered in the various authorities' public outreach efforts, including: "public apathy, unrepresentativeness, parochialism, the efficacy of methodology, negative attitudes of stakeholders, and resource constraints" (Bickerstaff et al., 2001). The parallels between the findings of the UK study and the issues that came up in my interviews with Metro Vancouver mayors are remarkable: at least one mayor or stakeholder mentioned each of these problems. The authors go on to talk about specific practical problems with the outreach efforts, such as: "poor turnouts to events and meetings, poor

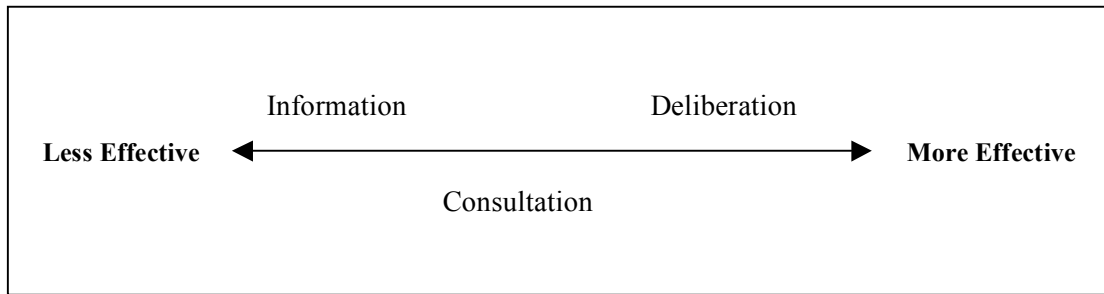
response to questionnaires and consultation documents, and general difficulties in engendering participation, particularly amongst the wider public (Bickerstaff et al., p. 444).

Methods that encouraged greater deliberation from the public such as forums, focus groups and public meetings, were less commonly used, but more promising in terms of their educational capacity, and were generally found to be more meaningful to participants. For a method to be truly deliberative, it must involve “in-depth debate and a sharing of knowledge and views” (p. 439, *ibid*). The time and resources required to host deliberative outreach opportunities can be a barrier for public authorities. But the value of discursive methods rather than traditional “passive” methods of public outreach are well documented (Bickerstaff et al, 2001; Bloomfield et al, 1999). Some of the positive outcomes of participatory exercises noted in Bickerstaff’s study are:

- **Relationships:** Better citizen-council relationship
- **Empowerment:** improved communication with public; community ownership of measures, particularly around social equity issues
- **Knowledge and understanding:** Understanding and awareness of transport issues; understanding and support for policies/strategies; sharing of knowledge, particularly the two-way nature of understanding; increased appreciation of problems and points of view of others

Supported by the evidence from my interviews with Metro Vancouver mayors, the findings of Bickerstaff and Walker (2001) help build a foundation for defining what “effective” public outreach looks like in the context of transportation planning. While I acknowledge the increased difficulty (both in terms of resources and logistics) of planning and executing deliberative models, the following diagram helps clarify what I mean by ‘effectiveness’ in public outreach initiatives.

Figure 1: Public Outreach Effectiveness Continuum



The three terms, information, consultation, and deliberation are intended only as starting points for further definition. It is entirely possible that methods described in the literature as “consultation-based” could have elements of deliberation, and vice versa. It is in fact very likely for deliberative methods to include elements of information and consultation. Overlapping notwithstanding, I characterize the three concepts as follows:

Information campaigns and public outreach efforts that involve the one way dissemination of information from an authority to the public about planning and decision making is considered less effective than other more participatory approaches. One of the major limitations of this method is that the disseminating body has very limited ability to know how effective the method was in reaching the public.

Consultation efforts that ask the public to give feedback on a particular issue or set of issues can –depending on a number of factors- be more effective than information campaigns. Primarily this is because the consulting party is able to know more about demographics and opinions of the group they are seeking to reach. Consultation efforts that involve the face-to-face exchange of information and feedback are more effective because there is an opportunity for the public to ask questions and clarify information. The most important distinction between more and less effective forms of consultation is whether or not the consulting body is prepared to incorporate feedback from the public. When the public knows they are contributing to the decision making process, a greater sense of empowerment, voice, and investment in the process is

realized. Problems with attendance and poor response rate are often associated with consultation efforts that simply seek public opinion on predetermined plans or policies.

Deliberation is when members of the public have a meaningful say not only in the outcome of a process but also in the generation of ideas and inputs that form the alternatives. This type of public outreach encourages the public to consider other perspectives and has the most capacity for education and raising awareness. Decisions based on a deliberative, inclusive process empower participants and give them a sense of ownership over and investment in decisions that are made. The most effective forms of deliberation incorporate multiple sessions for participants to discuss and learn, which allows for deeper reflection and consideration of the subject.

Clearly, tradeoffs exist between the various forms of public outreach outlined above. The most significant of these tradeoffs has to do with reach. Deliberation can only be accomplished in relatively small groups, so to reach a significant portion of the public presents major feasibility problems. Information campaigns are the opposite: an announcement in the paper or on radio may reach a large number of people, but the effectiveness is virtually unknown. These are important considerations and will be drawn upon in evaluating the effectiveness of public engagement strategies proposed in the “policy options” section of the paper.

5: Criteria and Measures for Evaluating Policy Alternatives

This section presents the criteria and measures for evaluating the different policy options in this study. My selections for criteria are based both on standard practices in public policy analysis (Patton and Sawicki, 1993; Bardach, 2009) as well as more specific criteria related to public engagement on road pricing. The measures are based on data that was generated from the interviews with the public, interviews with municipal mayors and stakeholders, the case study, as well as my own assessment and knowledge of the local factors that exist in the Metro Vancouver context. I acknowledge that the criteria presented here are not the only criteria one might use to evaluate the alternatives. They are what I consider to be the most relevant considerations in determining the strengths and weaknesses of the alternatives and identifying the tradeoffs between them. While I acknowledge the uncertainty and limitations of evaluating policies *ex-ante*, making clear the criteria by which the policies are evaluated allows the reader to know more about why certain policy recommendations are made. A summary matrix at the end of this section provides an “at a glance” version of the considerations and measures used to give meaning to the criteria.

5.1 Effectiveness 1 and 2

The effectiveness criterion is divided into two components: reach and quality. “Reach” refers to the effectiveness of an alternative to reach a substantial portion of the Metro Vancouver population. “Quality” refers to the quality of the engagement. This distinction is important because the quality of a particular alternative could be very high but reach very few people. Conversely, an alternative could conceivably reach a large number of people, but have little impact if it is low in quality. To measure “reach”, I use the threshold of 10% of Metro Vancouver

adults. This means the alternative is considered effective if it is likely to come into contact with at least 10% of the adult population. This threshold provides a marker for comparing different policies and a basis for discussion on how many people are likely to come into contact with the alternative.

For “quality” (Effectiveness 2) I use the “public outreach effectiveness continuum” (figure 1) from the case study section. Information campaigns that are based on one-way communication are considered the least effective and ranked as “low” in the matrix. Consultation efforts that seek the opinions of the public on policies that have already been developed by the authorities are ranked as “medium” to reflect the improved capacity for education and clarification in the engagement process. “High” is used to identify engagement efforts that involve the public early on in the policy process, encourage the public’s deliberation on the problem and potential solutions, and incorporate the public’s views and recommendations into the policy and planning process.

5.2 Social Equity

“Social equity” relates to the effectiveness criterion in that it measures whether engagement opportunities are made available to all member municipalities, according to their population. In addition, for an alternative to be “equitable” it must reach a broad cross section of society. For example, does the engagement strategy simply reach the “usual suspects” (transportation-related interest groups and stakeholders), or does it reach citizens with varying levels of civic engagement? Is the strategy accessible to minority groups with language barriers? Seniors that are physically constrained from participating, or, as Mayor Fassbender pointed out, are unfamiliar with computer technology and therefore unable to participate in on-line engagement strategies should be considered. Youth, who face the largest consequences of long-term decision-making as it affects the region, should also be considered.

5.3 Political Acceptability

The political acceptability criterion determines whether a particular alternative will encounter any significant political obstacles either from elected officials (municipal, provincial), or crown agencies such as TransLink and Metro Vancouver. This criterion does not lend itself well to the summary matrix, because political acceptability may be very different between the various levels of government. It is therefore important to refer to the qualitative evaluation of each alternative to fully understand the political implications of a given alternative. Analysis is based on the key informant interviews with public officials as well as my own assessments of the local, regional, and provincial political landscapes.

5.4 Public Acceptability

To evaluate the public acceptability of a given option, I use both the interviews I conducted with public, as well as data from the case study. While I acknowledge the danger of applying public opinion from outside the region to projections of public opinion here, the risk should be minimized by the fact that none of the alternatives is particularly controversial. This would not be the case if the policy objectives were to “sell” the public on a particular road pricing scheme. With the policy options focusing on increasing transparency of government spending and enhancing the public’s capacity to learn about various alternatives to congestion reduction, the potential for disapproval should be minimal.

5.5 Cost

Simply, this criterion evaluates the estimated financial cost of the alternatives as described in the policy alternatives section. Here, “cost” refers to financial costs incurred by government or non-government actors, beyond those associated with usual government bureaucratic processes, such as policy development and legislative processes. Estimates are

based on the cost of parallel initiatives from other regions or from locally generated professional quotes.

5.6 Administrative Ease

To distinguish “administrative ease” from “political acceptability”, I refer to the former as having primarily having to do with the administration and implementation of a program once legislators have approved it. While related, administrative ease should not be confused with the cost of a program. Analysing “administrative ease” allows for a discussion on the time required, and the complexity of a particular alternative. Consideration is given to whether past programs or policies could act help guide the administrative process of implementation.

5.7 Summary Matrix of Criteria

Table 2: Criteria and Measures

Criteria	Definition	Measures	Source
Effectiveness 1 (Reach)	Alternative reaches a substantial portion of the population	<ul style="list-style-type: none"> At least 10% of Metro Vancouver drivers comes into contact with the alternative 	Key Informant (K.I.) interviews
Effectiveness 2 (Quality)	Engagement strategy is of high quality. Prepares public for future road pricing proposals	<ul style="list-style-type: none"> Information = poor Consultation = good Deliberation = excellent 	Case studies
Social Equity	Opportunities to participate are made available to all municipalities	<p>Likelihood the strategy reaches all 21 core municipalities</p> <p>Strategy reaches broad cross section of the public</p>	K.I. interviews
Political Acceptability	Strategy is politically acceptable	Number and magnitude of political barriers to implementation	K.I. interviews
Public Acceptability	The degree to which the public supports the alternative.	<p>No opposition = excellent</p> <p>Some opposition = good</p> <p>Severe opposition = poor</p>	<p>K.I. interviews</p> <p>Interviews with the public</p>
Cost	Cost of design and implementation	Dollars	<p>Case studies</p> <p>K.I. interviews</p> <p>Professional quotes</p>
Administrative Ease	Alternative is relatively easy to implement	Implementation could happen within a year	<p>Case studies</p> <p>K.I. interviews</p>

6: Policy Alternatives and Evaluations

The three proposed policy options (in addition to the status quo) might appear quite different in their objectives. They are not. Each option represents a distinct way of addressing the same policy objectives: to increase the transparency of the costs of driving in Metro Vancouver and enhance the public's ability to understand different congestion management alternatives. Findings from the interviews show that the disconnect between using the roads and paying for the roads, and the lack of transparency around the costs of driving are causing people to misperceive the true costs to themselves as drivers and to taxpayers in general. This finding may also best explain the original question of this paper: why does the public oppose road pricing? If the public does not perceive the fact that they are currently paying for road use, it makes abundant sense that a system such as road pricing that illustrates the costs so clearly, would be met with opposition. If the public is not able to perceive the benefits of different road funding systems, any debate and discussion on those alternative systems will be compromised. If Jon Garson (BC Chamber of Commerce) is correct in saying that some form of road pricing is "inevitable" in Metro Vancouver, strategies to enhance public awareness of the issues must be implemented now in order to prepare the public for future discussions. Which strategies to engage and when to engage them forms the subject of the following policy options analysis.

Recall the refined policy problem and objective stemming from the research data:

Policy Problem: The public underestimates the costs of driving and congestion due to a lack of cost transparency, which results in a weak understanding of the costs and benefits of different congestion management strategies.

Policy Objective: to increase the transparency of the costs of driving in Metro Vancouver and enhance the public’s ability to understand different congestion management alternatives.

Table 3: Policy Alternatives

Policy	Summary Description
Status Quo	TransLink public education/consultation efforts (“Be Part of the Plan” and “TransLink Listens”) as well as community organizations’ initiatives such as the Cooperative Auto Network’s “Transport Camp” and BEST’s “AutoObesity” program.
Fuel Receipt Detailing	Increases transparency of driving costs by detailing the tax information on gas station fuel receipts. New breakdown includes: taxes paid on fuel and where revenue is directed, including “road access/use charge” and “tax payer contribution” showing the ratio of private/public costs of supplying and maintaining roads
Transportation Simulation Game	Internet-based game that allows participants to see the full cost of different transportation choices as well as how those choices impact taxpayers, drivers and the amount of time stuck in congestion. Provides basic stats by tracking players’ decisions by municipality and encourages engagement in transportation planning.
Citizens Assembly on Road Pricing (CARP)	Residents representing all Metro Vancouver municipalities are recruited to participate in the CARP. Multiple weekends over the course of a year allow for participants to learn about road funding issues from experts, and debate a range of congestion management options. A Metro Vancouver-wide referendum would be held on the congestion pricing strategy recommended by the assembly.

6.1 Status Quo

To clarify: the status quo presented in the policy options differs from previous uses of the term “status quo” in the paper. Where previous usage referred to the current approach to reducing congestion and funding roads by transportation decision makers, here it refers specifically to the consultation efforts currently being undertaken by various groups in the Metro Vancouver area.

Current efforts to improve the public's understanding of the true cost of driving and the complexities and trade-offs of congestion pricing are varied and uncoordinated. There is no single effort to specifically address these issues; rather, they are addressed to varying degrees through other transportation outreach initiatives and communication efforts. This is a reflection of the complex funding arrangement currently in place between the province, TransLink and the Metro Vancouver municipalities. For example, TransLink is responsible for certain roads (the major road network) and bridges (Pattullo, Golden Ears), the province others (Port Mann, Pitt River), while the municipalities are responsible for maintenance and upgrade of residential streets and smaller bridges. It is therefore understandable that there has been no single effort to address the issues of transparency and education around driving and road funding. It is also possible that the problem of congestion has never been framed in terms of a problem of education and weak price signals (transparency), which would help explain the absence of a coordinated, focused effort.

TransLink is currently responsible for consulting with the public over regional transportation decisions. But as noted above, they are only one of many decision-making bodies in the region. It would therefore be illogical for TransLink to consult with the public on transportation issues they are not directly responsible for. Nevertheless, TransLink does currently provide most of the initiatives dedicated to public education around transportation decisions. "Be Part of the Plan" is TransLink's official public consultation program. The program entails a variety of methods including media communications and traditional open-house events in which members of the public can meet with TransLink officials to learn about transportation issues and voice concerns. Other TransLink initiatives include the on-line advisory panel "TransLink Listens", which surveys public opinion on transportation issues, and the "Buzzer Blog", which provides an on-line forum for people to learn about transportation issues and post comments.

TransLink's efforts to communicate and consult with the public are creative and provide an important outlet for people to learn about TransLink initiatives and voice concerns. One

limitation, however, is that many of their methods rely on “self-selecting” members of the public. Interest groups and agenda-driven individuals consequently tend to dominate the outreach landscape, making it difficult for TransLink to reach the wider public—both in terms of disseminating information about transportation issues, and gathering opinions from the broader public.

TransLink’s close relationship with the provincial government also limits the scope of its consultation efforts. For example, as long as the provincial government maintains its current policy toward tolling (i.e. *guidelines for tolling*) it will be impossible for TransLink to consult with the public on road pricing options because it would contradict provincial policy.

Beyond TransLink, efforts to increase cost transparency and enhance the public’s understanding of congestion management alternatives are minimal. Better Environmentally Sound Transportation is active at community events, promoting awareness of the costs of driving through programs such as “AutoObesity”. The Cooperative Auto Network (a regional car-sharing service also known as “CAN”) has a strong community presence in Vancouver and deals directly with transparency issues through their pricing scheme, and the broader implications of a vehicle-dominated transportation network through marketing and education efforts. While primarily devoted to providing car-sharing services to its members, CAN hosts public consultation events such as “Transport Camp 2009”, which brought together transportation planners, decision makers and members of the public to discuss current transportation issues. Events like “Transport Camp” experience the same self-selection problem, though, as other traditional outreach events, attracting special interests and people well versed on current transportation issues. And while growing, CAN is not widely known outside of Vancouver (where its membership is concentrated) and is therefore limited in its ability to communicate with the wider Metro Vancouver public.

Ranking the status quo alternative in the summary matrix is problematic because, unlike the other policy options, it is not a unified, well-defined strategy that can be evaluated

systematically. To recognize the efforts of TransLink and other community groups to educate the public on transportation issues, I have described the effectiveness (1 and 2) criteria and the social equity criteria as “moderate”. Political and public acceptance are described as “good” due to the fact that TransLink has been conducting similar outreach programs for many years. If significant opposition to the current approach existed, we would less likely be able to see a stable track record of consultation. The costs associated with the status quo were too disparate to gather into an accurate total. Moreover, the programs are all likely to continue regardless of whether other more specific strategies are adopted. Along with administrative ease, which is irrelevant considering the programs are already implemented, costs are assigned a “not applicable” status in the summary matrix.

6.2 Fuel Receipt Detailing

Interviews with the public consistently showed a lack of awareness over how roads and transportation infrastructure are funded. In addition to being incorrect, the widely observed perception that “roads are free” symbolizes the current mentality of the citizen-as-consumer relationship with government, rather than the reality of the citizen-as-funder notion. There is in fact a direct connection between using and paying for the roads in the sense that, every kilometre driven burns fuel, and taxes are paid on every litre of fuel purchased. A number of participants felt the government should do a better job in communicating the costs of the road network and how drivers pay for them. The information currently provided on retail fuel receipts, for example, provides no information about the breakdown of taxes apart from the amount of GST paid. Some simple changes to the layout of the fuel receipt would give consumers an easy opportunity to look at the breakdown of taxes paid on their purchase of fuel, and help illustrate the connection between using the roads and paying for the roads (fig 2). This policy would not change the amount or the way people pay for roads and transportation, only the transparency of the information.

Figure 2: Current and proposed changes to retail fuel receipts

Current Receipt Detailing	Proposed Receipt Detailing
Super Save Gas	Super Save Gas
12DEC09 4:30pm	12DEC09 4:30pm
Pump #: 2	Pump #: 2
25.295 L @ \$1.073 REG/Self \$27.14	25.295 L @ \$1.073 REG/Self \$27.14
Total: \$27.14	Total: \$27.14
GST note:	Taxes and Fees in Fuel:
Fuel: \$1.29	Fuel: \$16.25
Total: \$1.29	HST: \$1.29
 	Carbon Tax: \$1.20
 	Transit Levy: \$3.75
 	Road User Fee*: \$4.50
 	Non-road User Con: \$1.50
Thanks for shopping at Super Save GST reg#1350030300248	HST reg#1350030300248 *provincial and federal excise taxes

Currently, the only tax information printed on fuel receipts relates to the portion of GST paid on the total amount. Under the new policy, the following information would be printed on the receipt:

- HST (effective July, 2010) and Carbon Tax
- Transit Levy
- Proportion (in dollars) going to finance roads and related projects
- Taxpayer contribution to roads funding not paid by fuel tax

Note the language on proposed receipt makes explicit reference to “road user charge”, which helps make transparent the costs of using roads based on the amount one drives. Including “road user charge” would also passively orient the public to thinking in terms of a pay-per-use model. That way, should the government be interested in testing different road user charges, such as congestion charging or distance charging, the public would be better positioned to think in terms of *alternatives* to the status quo rather than “new” charges. Given that the fuel tax will eventually need to be replaced, the government would be well served by a public that understands the basic nature of road funding and is able to engage with a variety of options for funding solutions.

Implementation Issues

Communications with the Ministry of Finance (see appendix A) revealed the basic legislative process required to regulate a change on the requirements of taxes shown on fuel receipts. Currently “there is no requirement to show the amount of tax as a separate line item, only the rate”, and a breakdown of the different rates is only made available upon request by the purchaser. To amend these requirements would “require a change to the *Carbon Tax Act Regulation* and *Motor Fuel Tax Act Regulation*”, and a change to a regulation generally requires approval by Cabinet by way of an Order in Council.

A change in the requirements to fuel tax receipt information would impact fuel retailers. Communications with the I.T. branch of Super Save Gas in Langley shed light on what most retailers would have to do to meet new the requirements of the new regulation. Because the information printed on receipts is computer generated, no physical changes to equipment would be required. However, the software that determines the content would have to be updated. The technology that controls the receipt information at the pump is very sophisticated because “it has to be able to communicate with banks as well as produce the usual information”(see appendix A). To determine the extent of the changes, it was necessary to speak with the tech providers.

InfoNet Technology Corporation is a local “point of sale” IT company that provides software services to gas stations like Super Save for their receipt technology needs. A representative from InfoNet Corp. explained that, “any changes to information on fuel receipts, whether it’s banking information, tax information would be covered under a “general agreement”, and that adding new information would be “at no charge”. A general agreement that covers ongoing maintenance and content changes would cost about \$1500 per year. In other words, the long term costs associated with the policy option would essentially be the incremental cost of paper and ink needed to print the added details on customers’ receipts.

Analysis and Evaluation

To evaluate the effectiveness, I consider both the reach (effectiveness 1) and the quality (effectiveness 2) of the policy alternative in terms of meeting the larger policy objectives of transparency and education. The ability of this policy to reach a large number of Metro Vancouver drivers is determined to be “excellent”, as noted on the summary matrix. It is clear that more than 10% of the Metro Vancouver population semi-frequently pays for fuel—either at the pump or at the gas station kiosk. What is less clear is, of that large groups of people, how many actually retain the receipts and read them? It could be argued that, from a taxpayer’s perspective, there is currently very little of interest on the receipts. And unless consumers are made aware of the changes made to the receipt, there is little reason to believe they would start looking at them. One way to address this would be to also signal the new information on the LED readouts on the pump. This would be more expensive in terms of reprogramming (and the opportunity costs for gas stations currently using the LED readouts for advertising), but a simple pilot study would allow us to know the effectiveness of adding information to the LED readout.¹²

¹² One gas station could be equipped with the LED readout technology (and the new receipts), another gas station with only receipts. Follow-up interviews would demonstrate the importance of the LED component, and therefore infer the value of the required change in pump technology.

In terms of quality (effectiveness 2), the fuel receipt detailing option is considered to be “poor”. This is primarily because the strategy communicates information in a passive, unidirectional way, which, according to conclusions of the case study, is less effective than outreach strategies that engage the public in debate and deliberation. The effectiveness of the option is also considered weak because there is no way of knowing what impact the alternative is having on the public. Surveying could help identify impacts, but there is no mechanism within the option that provides that information. One positive aspect of the alternative (despite its “poor” rating) is that the reach of the communication is not only substantial: it is recurring. In other words, where other forms of engagement may be of higher quality but only engage people once, the changes to the fuel receipt would result in continual, semi-frequent reminders of the cost of using the roads.

The social equity implications are considered “excellent” because the strategy offers the same opportunity to all drivers, regardless of municipality, to better understand the costs of using the road and the relationship between using and paying for the transportation network. I have summarized the costs of the policy as “under \$10,000” in accordance with the information provided by InfoNet Technology Canada and the IT department of Super Save Gas in Langley.

To evaluate the public and political acceptance of this alternative, we must confront the reality that, for those members of the public who had previously been unaware of the breakdown and amount of tax paid on fuel, the information could be received negatively. This sort of cognitive dissonance was prevalent in a number of the interviews with the public. It could be that people, invested in a certain lifestyle, prefer not to be reminded of what it is costing them on a regular basis. While I consider whether an individual wishes to engage in this sort of “wilful blindness” a matter of personal choice, as a society, we must ask whether we want our policy mechanisms to facilitate or reduce such behavior. For economic reasons, the latter would be prudent. For the analysis of the policy alternative, I simply raise the issue for consideration.

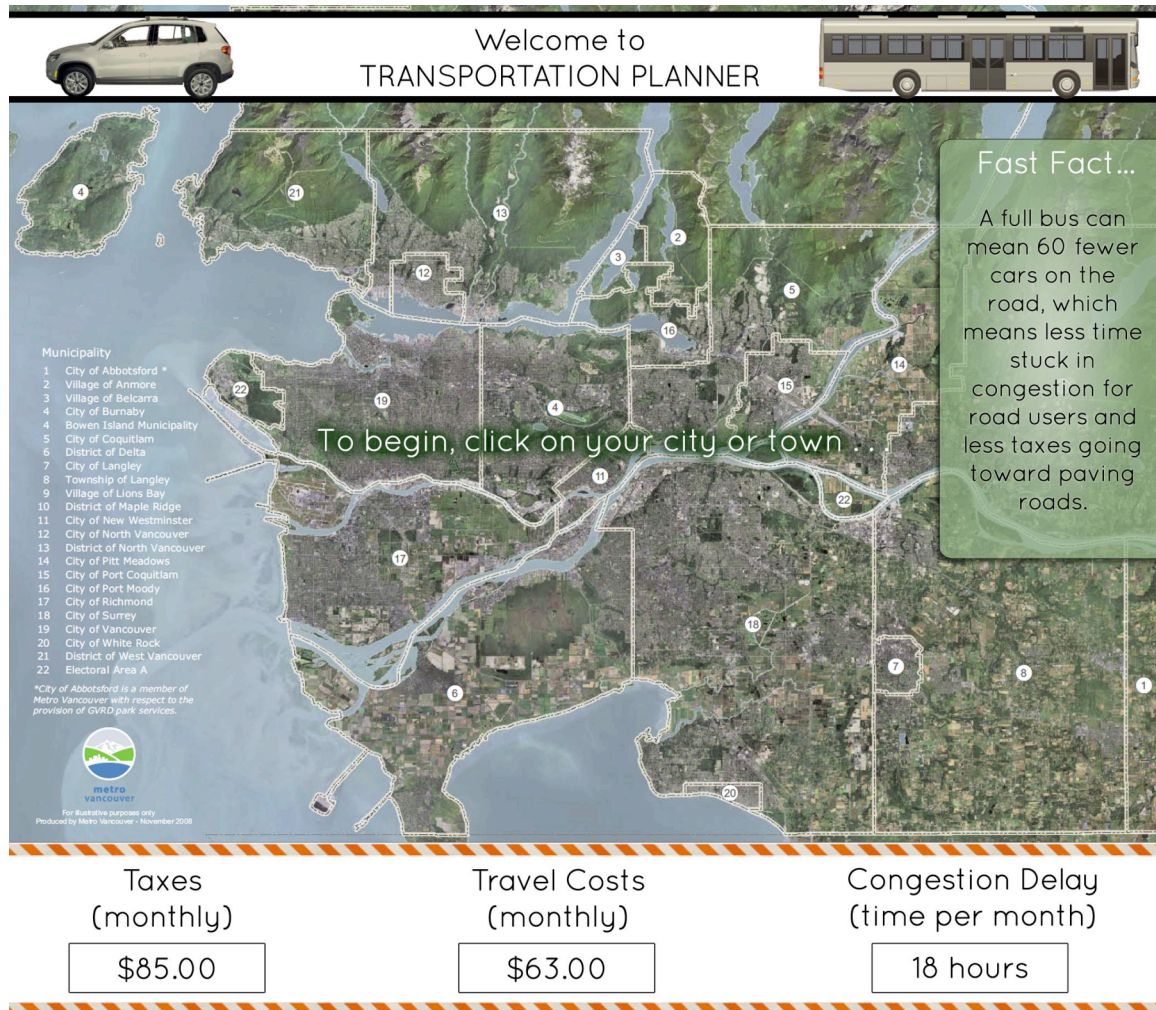
Should the policy be met with some public opposition, it is reasonable to assume there could also be political apprehension around adopting it. Of all the stakeholders and public officials I interviewed, only one asked to remain anonymous. He is also the only one who raised the possibility of political opposition to the fuel receipt alternative. He said, “there may be also some uproar from the government because some of that money (from the fuel tax) goes to general revenue, and they like to hide money in general revenue, so now they have to be black and white about what they spend” (anonymous stakeholder interview). It is difficult to imagine any long-term public opposition to the fuel receipt changes, and it is equally likely that most of the public will consider the increased transparency in fuel taxes as positive change (this was certainly the true in the case of the interviews with the public). Therefore, I consider the public and political acceptability of the alternative to be “good”.

The administrative feasibility of implementing this option falls primarily upon the provincial government, as well as fuel retailers. As described above, a change to the requirements of what is printed on fuel receipts in B.C. would require amendments to the carbon tax and motor fuel tax acts and approval by Cabinet. For retailers, minimal administrative changes will be required, as noted in the communications with Super Save Gas (retailer) and InfoNet Tech. Canada (technology provider). I therefore consider the administrative ease of the option “good”.

6.3 Transportation Simulation Game

The on-line simulation game, known as “Transportation Planner”, is designed to expand public engagement and education efforts beyond the traditional consultation approaches of public meetings and surveying. The game is different in two important ways: it is dynamic (the participant gives and receives information about transportation planning); it is available on-line.

Figure 3: Transportation Game Prototype



Objectives

The over-arching objectives of the game are to increase the transparency of the costs of driving, and enhance the public's ability to engage in the tradeoffs between different approaches to transportation planning. The game can also address other objectives and issues that came up in the interviews with the mayors. These include:

- Improve the public's understanding of the complexity of transportation planning;
- Improve the government's understanding of public perceptions towards transportation issues;
- Engage youth and other groups within the public that might not participate in traditional public outreach efforts;

- Capitalize on innovative, cost effective methods of public engagement by utilizing on-line applications and social media, and;
- Combine “fun” learning, and civic engagement in a dynamic way.

How It Works

Due to the significant resources required to complete the research and development of the game, the following description provides only a “rough” sense of what it would be like to play the game. Bear in mind that the game could be redesigned to accommodate other policy goals. The current design is meant to address the specific goals of this paper: cost transparency and education. Many of the design choices were based on feedback from interviews with public officials, as well as consultations with website designer David Montie (SparkJoy Studios, Vancouver).

Players start the game with a map of the Metro Vancouver region and are asked to “click” on their home municipality. Next, the player is led through a short series of questions regarding their primary travel mode (vehicle, transit, other) and the annual costs associate with this mode. If the player selects “driver”, for example, their annual costs (lease payments, insurance, repairs) and monthly costs (gas, parking) are broken down and recalculated as a monthly figure. This figure, along with monthly calculations of “taxes” and “hours in congestion” are visible for the rest of the game in “accounts” at the bottom of the screen, and fluctuate depending on choices made by the player (see figure 3). It is important not to overburden the participant with requests for personal information, lest they lose interest in the playing the game.

From there, various scenarios and problems pop up on the screen, such as the effects of a population increase on road expansion costs and traffic congestion. The player is asked to choose, from a number of alternatives, which they consider to be the best solution. “Hovering” over an alternative with the mouse allows the player to see how their choice would impact their personal travel costs, their taxes, and the projected change in hours/month stuck in congestion. Each

alternative has an option to “seek further information”, if they wish to learn more about the complexities of transportation spending decisions.

One of the most useful aspects of the game is that it has the capacity to generate statistics on not only the choices people make, but also how choices change depending on the degree of information that is sought by the player. Consultations with SparkJoy studios revealed that “IP addresses”, which are embedded in the design of the website, allow the site host to know which municipality the player is from, whether they are a return user, and if they are, how many times they have played. Another useful feature of the game is that it can easily be adapted to respond to player behaviours. If a particular stage of the game shows a drop in participation, the stage can be reviewed and redesigned to improve player retention or to change the statistical information being collected. At no point is the player’s name or exact address requested, so privacy concerns should not be an issue. Nevertheless, should a municipality or public authority be interested in using the game, privacy concerns would best be evaluated for the specific time and context of use.

Dissemination

To maximize dissemination and use, the game should be made available to the public for free, online, with no log-in required. Public transportation and other civic forums, city halls, libraries and government buildings are logical places to have dedicated computer terminals for the game. Less conventional, but possibly more effective locations might include ferry terminals, passport offices, medical services buildings: wherever a waiting room exists. Use in Metro Vancouver high schools would require consultation with the various school boards to have the game integrated effectively into classroom learning. But the value of engaging youth on these issues, considering the long civic life they have in front of them, is immeasurable. The most effective location for the game, in terms of involving large numbers of citizens, might be social networking sites such as Facebook. It is possible that some of the statistical information would be lost if the game is “embedded” in another site. However, the primary purpose of the game is to

educate, not collect statistics. Widespread use of the game on a site like Facebook, therefore, would be part of an effective policy implementation program.

Analysis and Evaluation

To evaluate this alternative against the same set of criteria as the others, I begin by considering the two forms of “effectiveness”. The reach of the game could potentially be substantial if the development and deployment of the game are strong. It is unlikely that the game would reach 10% of the Metro Vancouver public, but is reasonable to assume it would reach considerably more members of the public than traditional outreach methods such as public consultation forums. The quality of the option (Effectiveness 2) is considered “good” because it involves a dynamic learning opportunity (the player can give and receive information), but not “excellent” because it does not allow for deep engagement or deliberation such as citizen juries or focus groups.

For the game to be user-friendly, entertaining, and most importantly, based on current accurate statistical inputs (costs of driving, Metro Vancouver mode split, costs of repairing and expanding roads, sound projections on congestion pricing impacts), the game would require considerable research and development. These account for the majority of the estimated cost of developing the game, which is \$125,000 (see Appendix B). Costs associated with maintaining and updating features of the game would be negligible. The game would be relatively easy to implement from an administrative standpoint. However, certain applications such as incorporating the game into school classrooms would require more time and consultation.

Interviews with Metro Vancouver mayors indicate there would be little to no political opposition to this policy alternative. As the game is focused on providing information to the public in a fun and entertaining way, the public acceptance of the alternative would likely be high. The only concerns might be from players in areas poorly served by transit, for whom

alternatives in the game are not feasible alternatives in real life. The game could be interpreted as “out of touch” by these players (interview with Mayor Green). The social equity issues associated with the game are minimal, because most of the Metro Vancouver population is computer literate. The only groups that may have difficulty accessing the game would be seniors unable to use computers, and others who do not have regular access to a computer or the internet (interview with Mayor Fassbender).

6.4 Citizens’ Assembly on Road Pricing (CARP)

The Citizens’ Assembly on Road Pricing (CARP) alternative addresses the same policy objectives as the other alternatives (transparency and education) from a different approach with a different set of tradeoffs. Citizens’ assemblies form part of a larger set of public engagement strategies that focus on in-depth public deliberation on a policy problem or strategy. The US Department of Transportation provides an outline of different types of “face-to-face” meetings on a website entitled, “*public involvement techniques for transportation decision-making*” (USDOT website). It includes: “public meetings/hearings; open houses/open forum hearings; and conferences and workshops”. Another common type in the same “family” of strategies is the citizens’ jury, which was used in the early stages of Minnesota’s communication strategy on “value” pricing. All of the abovementioned strategies vary somewhat in terms of design; many have a common set of characteristics. Some readers may ask why I have chosen a citizens’ assembly model rather than another type of engagement strategy, to which I respond: what matters in choosing an engagement strategy is not so much the name as it is the content and core characteristics of the design. The design of the Citizens’ Assembly on Road Pricing, as described below, is driven by the findings of the interviews with the public, and the mayors and stakeholders, as well as findings from the case study on effective public outreach and engagement strategies.

Guiding Principles for Design

Recognizing that a fully developed format and agenda for the CARP would require the time and resources of a professional team of consultation planners, my objective is to sufficiently describe the CARP so as to be able to evaluate it against the same set of criteria used for the other options. Accordingly, I focus primarily on guiding principles for design (based on the interview and case study data), rather than specific content, which can be chosen by the CARP planners in accordance with the outlined principles of effective public consultation.

For the strategy to be successfully implemented, the governing authority would provide funding and basic guidelines to a professional consultation planning team on the objectives and principles of the CARP. The objective, as presented to the citizen participants would be: to consider the different alternatives for solving the problem of road congestion in Metro Vancouver, and to recommend one for decision by referendum (Metro Vancouver residents only) CARP guiding principles might include:

Citizen body should be diverse: To limit self-selection issues, the citizen-participants should be recruited based on a variety of factors such as: geography (all municipalities should be represented), age, gender, minority representation, and socio-economic status.

Equal opportunity to contribute: Group dynamics are such that some participants will be more outspoken than others. To ensure equal opportunity for all participants to contribute, and to reduce the risk of an individual or group of individuals dominating the debate, a session facilitator should ensure every participant has a roughly equal amount of time to share his or her views, ask questions and contribute to the process.

Participant-centred, participant-driven: every aspect of the agenda should include space for citizen generated ideas or suggestions. At the end of the final session, the citizens' body will determine the referendum alternative.

Time for deliberation and reflection: Multiple meetings/weekends should be spaced over the course of a year. Participants must be allowed sufficient time to digest and reflect on materials and policy alternatives.

Transparent and inclusive to general public: One member of the organizing committee should be responsible for keeping the meetings and materials accessible to the wider public through various media coverage, web-based tools such as live webcams, blogs, discussion forums, and inter-session reports. CARP organizers should consider options for providing a vehicle for the general public to feel as though they have a voice in the process and not just a voice at the time of the referendum.

The CARP should provide opportunities for education as well as deliberation and on how the region might best address congestion issues. In addition to the lessons available from the citizens' assembly on electoral reform, organizers might wish to consult the work of Shauna Sylvester and the Canada's World project. Although the project is now over, all the resources and processes used to engage the public on the subject of foreign policy in Canada will be available on the project website for a minimum of five years, starting April 1st, 2010. Considering the different lessons from other deliberative engagement projects, a basic CARP curriculum (for illustrative purposes) might include:

- Problem definition, discussion of objectives, structure and schedule of CARP;
- Intro to transportation planning and policy, including: principles of supply and demand, public goods, supply side and demand side management, history of transportation and road planning, regional transportation issues/perspectives;
- Discussion on "costs of congestion";
- Case studies on different approaches to congestion management;
- Introduction to road pricing concepts, objectives and impacts, and;
- Participatory "trade-offs" activity based on raising and spending tax revenues.

These suggestions for content and curriculum are not exhaustive. They are simply based on the key findings of this study. The planning committee should consider further research into the subject of public perceptions of congestion and road pricing (see recommendations section) to add weight to the rationale for the agenda and to increase the public acceptability of decision-making process.

Analysis and Evaluation

A basic philosophical question must be addressed regarding the design and implementation of the CARP, which is: If the process is going to be fair, transparent, and citizen-driven, how does the planning committee go about setting the agenda and choosing “expert speakers” who will ultimately shape the information and the opinions of the citizen participants? Logically, the planning committee would need to make a number of decisions such as schedule, format, agenda (alternatives for consideration) and scheduling guest speakers in advance of the citizen participation phase. Increasing the transparency of the deliberations (see guiding principles) will help ensure that CARP planners do their best to provide a balanced agenda that considers all reasonable alternatives to the problem. To further safeguard against the risk of the organizers driving the agenda (and outcomes) of the CARP, I recommend that an option always be left “open” for the citizen participants to make recommendations. The participants should also be included in the “problem definition” phase of the agenda.

To rank the effectiveness of the CARP alternative, I first consider its reach and impact on the Metro Vancouver public. This is difficult to assess due to the variety of ways Metro Vancouverites will be impacted by the CARP. Clearly, a very small number of people will get to participate in the CARP process directly; however, a much larger number of people will interact with the CARP process through media (newspapers primarily) and on-line communication tools mentioned above. While it is true that all eligible voters would have the opportunity to participate

in the referendum, the reality is only a fraction of the Metro Vancouver public is likely to vote.¹³ Because the CARP is defined specifically in terms of how it engages the participants, I consider all other public interactions with the CARP outside of the measurement of effective reach, thus ranking it as “poor” in the summary matrix.

The effectiveness of a CARP in terms of quality of engagement is potentially very high. In accordance with the “public outreach effectiveness continuum”, the alternative is highly deliberative, educational, participatory, and encourages “increased appreciation of problems and points of view of others” amongst participants (Bickerstaff et al, 2001). I therefore consider the quality of engagement to be “excellent”.

Social Equity concerns: for the purpose of this analysis, which has defined social equity in terms of how people from Metro Vancouver municipalities are affected, the social equity implications of a CARP are good. As long as the recruitment and design of the curriculum takes into consideration all 22 municipalities, there should be no major concerns with social equity of the alternative. Should the province decide to fund the CARP, there could be equity concerns for other regions of the province. Metro Vancouver is not the only region in BC that suffers from the costs of congestion: Kelowna, Kamloops and numerous other regions also suffer to varying degrees from traffic congestion and road costs. To address this, the province could have a “standing offer” to fund any city, town or region interested in addressing congestion issues through a CARP.

Political acceptance for the CARP would vary across different levels of government. Interviews with the mayors revealed strong support for the alternative; many of the Metro Vancouver mayors host informal “info sessions” (interviews with Fassbender, Green) to encourage civic engagement in their communities. Assessing the provincial government’s support

¹³ Voter turn-out for City of Vancouver in the last two municipal elections was 32% (2005) and 31% (2008), respectively. Source: City of Vancouver website: http://vancouver.ca/ctyclerk/elections/voter_turnout.htm

for a CARP is difficult. I was not able to secure an interview with a representative of the Ministry of Transportation and Infrastructure during the research phase of the project. Full provincial support (i.e. funding) for a CARP would have to follow a revision of the current tolling policies (see provincial *guidelines for tolling*), lest there be an internal conflict within the province's position.

Both Jon Garson (BC Chamber of Commerce) and Ray Hudson (Surrey Board of Trade) raised stakeholder concerns with TransLink being involved in the process. Garson believes if TransLink were to take the lead on funding and organizing the CARP, the public would view their participation as a “grab for more revenue”, rather than facilitating a fair evaluation of congestion management options that includes the status quo. Hudson also recommended that the province be the main body overseeing and funding the CARP. As he says, “I don't want to see one entity responsible for it. They (TransLink, Metro Vancouver) have their own agenda. I want to see some overseeing entity that is cross regional and representative” (interview with Ray Hudson). Garson also raised the concern that a citizens' assembly does not represent the views of major stakeholders. He says: “We'd be somewhat concerned with having no mechanism whereby the business community is guaranteed some sort of voice”. Given that the BC Chamber of Commerce officially supports some form of “comprehensive road pricing”, Garson was concerned with the referendum component. At one point he asked: “what happens if the referendum fails?” When asked whether there is value in the process of engaging the public (the larger objective of this paper), he agreed, saying, “anything that elevates the discussion above where we are now, would be good” and, “I can't see a better model (than the CARP) if it's designed well.

Public acceptance of the CARP is expected to be high, provided the overseeing body communicates it as a fair and transparent process. Opposition from members of the public with a fundamental distrust of government or a negative perception of public consultation processes is

possible. Given proper funding and effective communication strategies, the public should be supportive of an initiative that is focused on public education and involvement in municipal issues. I therefore characterize public acceptability of the option as “good” in the summary matrix.

The entire cost of implementing a CARP would likely be over \$400,000. This does not account for the costs associated with the referendum. I was not able to obtain information about the costs of the Citizens’ Assembly on Electoral Reform due to the fact that it is currently not operating. Contact information from their website led to disconnected numbers and email addresses. This information should exist however, and would be a useful indication of the budget necessary to host a successful CARP process.

To evaluate the administrative ease of the CARP I divide the process into two phases: administrative issues in advance of the CARP, and, administration of the CARP itself and the referendum that will follow. Significant consideration must be given to the complexity and time required to prepare for a major public consultation initiative. The scoping and drafting of a timeline and schedule for implementation of the CARP is beyond the capacity of this paper. I do note, however, that administrators should benefit from the history and experience British Columbia has with the Citizen’s Assembly on Electoral Reform. The expertise and “lessons learned” should facilitate a smooth administrative process for the CARP, and help to ensure the entire process meets its overall objectives.

Table 7.1 Policy Evaluation Results

Criteria	Policy Options			
	Status Quo	Fuel Receipt Detailing	Transportation Game	CARP
Effectiveness 1 (reach)	Moderate	Excellent	Good	Poor
Effectiveness 2 (quality)	Moderate	Poor	Good	Excellent
Social Equity	Moderate	Excellent	Good	Excellent
Political Acceptance	Good	Good	Excellent	Variable
Public Acceptability	Good	Good	Good	Good
Cost	N/A	<\$10,000	\$125,000.00	>\$400,000.00
Administrative Ease	N/A	Good	Excellent	Moderate

7: Recommendations

The summary matrix of the four policy options provides a brief overview of the tradeoffs within a given strategy as well as those between strategies. Because the status quo approach does not specifically address the policy problem of transparency and education around the costs of driving and congestion, progress towards addressing the problem will be minimal if the status quo is maintained. In fact, if the current fuel receipt is included, the “status quo” approach may compound the existing problem of lack of transparency. The first recommendation (not a specific policy) is for the province and the municipalities to consider the costs and equity concerns with the status quo approach to transportation and determine whether it should be continued. Part of this consideration should include a review of the province’s current policy toward tolling. The value of congestion pricing (variable tolls) is being demonstrated around the world: how does society stand to benefit from a policy that limits the number of options available to it? For a serious regional dialogue on congestion relief alternatives to begin, the province must revise the “*guidelines for tolling*” policy to reflect the wide variety of objectives possible through tolling.

The second recommendation is with regard to the remaining three options. While the two “effectiveness” criteria identified the weaknesses of the CARP and the fuel receipt options, the general conclusion is that all three options perform relatively well against the criteria set out. It would therefore seem logical to recommend all three for a comprehensive approach to addressing the policy problem. However, policy makers may wish to consider a sequence and a timeframe for implementing the three options. The CARP option, which carries with it the consequences of a referendum, would require prior implementation of the other two options. Members of the public able to play the simulation game will be better able to relate to the subsequent deliberations of the citizens’ assembly. Similarly, the more time the public has to make the

connection between their fuel purchases and the cost of using the roads, the better they will relate to the information and recommendations of the CARP; fewer members of the public will mistakenly believe that roads are “free” and that use has no bearing on the costs of provision. Other pre-CARP activities might include a comprehensive guidebook and website for the public to review in advance of the assembly and through the referendum process.

Given the current economic climate, and that public dollars are always scarce, decision-makers may want to also consider the proposed sequence of implementation for budgetary reasons. The fuel receipt, which should be implemented as soon as possible, is by far the most affordable option, estimated at less than \$10,000. Under severe budgetary constraints, the simulation game could be redesigned in a simpler fashion to reduce the costs. I do not recommend, however, that the CARP be implemented without full political and financial support. As Mayor Rick Green said, “if you are not going to do it right, don’t do it at all”. And considering the significant implications of a referendum (yes or no), it would be unwise for the CARP to proceed without proper funding.

Next Steps for Municipal and Regional Leaders

Perhaps the most important message to retain from the findings of this study is that the Metro Vancouver is not ready for road pricing. Any immediate efforts by TransLink or the province to discuss the potential of road pricing would likely result in public backlash, amplified by the media. Even a brilliantly designed road pricing program—one that would reduce SOV trips, address equity issues, reduce congestion and provide funding for improved transit alternatives—would not necessarily be met with strong public support. It should not be assumed that the public would relate the costs of a congestion charge with the benefits of less congestion, let alone improved transit or other less-direct consequences. The extent to which the public understands (and potentially supports) the benefits of a well-designed road pricing scheme will depend largely on the communication efforts of the implementing bodies. The task of

communicating the benefits of road pricing will be an extremely challenging one as long as widespread misperceptions around the costs of driving and transportation funding persist. Hence, this study has developed and evaluated strategies for improving the public's understanding of the costs of driving and the awareness that different options to transportation planning and funding exist.

Municipal leaders must also consider the way in which the transportation problem is framed. In particular, leaders must think carefully about using the moral imperative of the environment as a means to change behavior. Guilt can motivate people to make the behavioral changes desired by policy makers; it can also make people more defensive about the behavior they are currently engaging in (SOV commuting for example), creating an unnecessary dichotomy between "good" and "bad" behaviors. The most effective approach may be to emphasize the idea of multi-modality: that driving may be necessary for certain trips, but perhaps not every trip. As the public's perceptions of "what's possible" expands to include a range of modes (walking, cycling, transit, park and ride), the better positioned we will be as a society to benefit from different approaches to transportation in the region.

Suggestions for Further Research

Retrospectively, researching public perceptions of road pricing and congestion has been a dynamic and ultimately illuminative process. Many sub-topics of interest and relevance to the larger problem of what to do about our congested roads have developed from the process.

Governments and transport authorities interested in pursuing road pricing policies would benefit from further qualitative studies that investigate barriers to the public's understanding of congestion. Data from the public interviews in this study revealed general areas in which gaps of perception and knowledge occur around the objectives and impacts of road pricing. However, by

conducting more extensive interviews within each municipality, a more accurate understanding of the key issues and barriers to understanding would allow for customized public engagement approaches, thus creating more effective, meaningful interactions between authorities and the public. Some areas for further study include:

- Public perceptions of car pooling; the key here is the untangling of environmental motivations (widely understood) versus costs of supplying roads to SOVs (poorly understood);
- Perceptions of taxpayer costs of peak-hour travel (the rationale for expansion), and;
- Fuel tax replacement options and the increasing problem of equity with the status quo.
- How lifecycle issues (parents with young kids, older kids) impact people's decision to drive, and whether time stuck in congestion is a cost or a benefit if parents need time to transition between professional life and home life.
- The impact of different communication approaches on the behavior change: guilt versus financial motivations

8: Conclusion

The Metro Vancouver public is dissatisfied with the current level of congestion and transit options. Addressing the congestion problem by allocating further road space to single occupancy vehicles will provide minimal relief and do so at a substantial cost to taxpayers. More efficient use of the existing road space may be possible through the adoption of road pricing initiatives, but without public support, adoption will remain out of reach. For the Metro Vancouver public to be able to determine whether an alternative to the status quo is desirable, the costs and benefits of the status quo and the alternatives must be made visible. This study proposed three alternatives to improve public awareness and engagement around understanding the costs of the status quo and creating opportunities to think about (and act on) different alternatives to congestion management in Metro Vancouver. Through the careful implementation of these policies, the public will be better positioned to determine whether a new approach to congestion and road funding would bring benefits to themselves as individuals and to the region as a whole.

Appendices

Appendix A: Records of correspondence: email and phone

*Email correspondence with Ministry of Finance re: Fuel Receipt Changes
February 12th, 2010*

If a final purchaser of any fuel subject to the carbon tax and motor fuel tax **requests** an invoice, then the seller must provide an invoice and that invoice must show:

- a) The date of the sale,
- b) The name and address of the person selling the fuel,
- c) The name and address of the person to whom the fuel is sold,
- d) The quantity of each type or subcategory of a type of fuel sold, and
- e) The rate of tax for each type or subcategory of a type of fuel sold.

This requirement is established in section 34 and 35 of the *Carbon Tax Act Regulation* and section 5.03(4) and 5.1 of the *Motor Fuel Tax Act Regulation*.

There is no requirement to show the **amount** of tax as a separate line item, only the **rate**. For example, if there was a sale of fuel to which both carbon tax applied and motor fuel tax applied (e.g. gasoline), the receipt would include the following:

Volume of gasoline sold: 1000 litres
Price per litre, inclusive of all taxes: \$1.059 / litre
Rate of Carbon Tax on Gasoline: \$0.0333 / litre
Rate of Motor Fuel Tax on Gasoline: \$0.2350 / litre*
Total: \$1059.00

*Assuming the sale is in the Vancouver transit area.

The *Motor Fuel Tax Act* and *Motor Fuel Tax Act Regulation* are available on our website at http://www.sbr.gov.bc.ca/business/Consumer_Taxes/Motor_Fuel_Tax/legislation.htm. The *Carbon Tax Act* and *Carbon Tax Act Regulation* are available on our website at http://www.sbr.gov.bc.ca/business/Consumer_Taxes/Carbon_Tax/carbon_tax.htm.

To amend these requirements would require a change to the *Carbon Tax Act Regulation* and *Motor Fuel Tax Act Regulation*. Generally, a change to a regulation requires approval by Cabinet through an Order in Council.

A change to a regulation requires approval by Cabinet by way of an Order In Council.

This correspondence describes how the Ministry interprets the relevant tax provisions for information purposes only. This response **may** be impacted by variations in circumstance, subsequent changes to legislation or subsequent court decisions. The Ministry is not responsible for updating this response if there are any subsequent changes to the law.

This response is provided as an aid to understanding the legislation and is not intended to replace the legislation.

Tax Inquiries Group, Ministry of Finance

*Notes from phone conversation with Super Save Gas re. fuel receipt
February 10th, 2010*

Conversation with “Ian” from the IT department of super save gas (Langley) explained:

Technology that controls the receipt information at the pump is very sophisticated because it needs to be able to communicate with banks as well as produce the usual information.

Because it is so sophisticated, most small to medium size retailers use software companies such as Bulloch Technology to provide them with software packages for the job.

*Notes from phone conversation with InfoNet Corp
February 10th, 2010*

InfoNet Technology Corporation, a local “point of sale” IT company that provides software services to gas stations said any changes to information on the fuel receipts, whether it’s banking information, tax information, would be covered under a “general maintenance agreement” and that changing information, even adding “new categories” would be no charge. The cost of Infonet’s maintenance agreement, which is in competition with other software companies, is \$1500 per year and is already being paid.

In other words, the cost to gas stations for incorporating more detailed information on the receipt would be incremental cost of paper and ink needed to print the new items.

Appendix B: Estimate for “Transportation Planner” on-line game



Transportation Planner Development Estimate

March 8, 2010

RE: Transportation Planner Game Development Estimate

Process:

Development – (Policy Analyst, Creative Director, Researcher)

- Define game's purpose or benefit to users (e.g. edutainment value showing how personal transportation choices and civic voting decisions change transportation outcomes).
- Research transportation factors related to game dynamics.
- Research relationships between factors and transportation system outcomes.
- Identify measurable variables related to factors and provide statistical data support.
- Define model for the game based on these variables and relationships.
- Define start and end game states.
- Define user interface constraints.
- Define user demographics.

Production – (Creative Director, Programmer, Artist)

- Build prototype model of game (no graphics).
- Play out scenarios and test model outcomes against expectations.
- Develop user interface and interaction flow assets.
- Develop graphics and game play assets.
- Build Flash version of model (interactive graphical prototype of game play).
- Test prototype with user samples / focus groups.
- Refine prototype according to feedback.

Post-Production / Beta Launch – (Web Developer, Marketer, Creative Director)

- Prepare game for various platforms (e.g. web page, Facebook app, desktop app).
- Prepare portal site and other social media marketing content.
- Limited user testing in a live environment.
- Open public launch of Beta version.

Each phase is estimated at 4-6 weeks full-time work for 3 people + support staff.

Total project estimate (development to launch as per above) is approx \$150K

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