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Ethics Statement

The author, whose name appears on the title page of this work, has obtained, for the research described in this work, either:

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or

b. advance approval of the animal care protocol from the University Animal Care Committee of Simon Fraser University

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Abstract

The use of mobile phones by drivers has remained prevalent in British Columbia despite the government’s best attempts to reduce distracted driving behaviours through legislation, penalties and awareness campaigns. This high-risk behaviour can cause serious or fatal injuries and has been recognized by the World Health Organization as a global problem. This study explores the problem through case studies and interviews with key stakeholders and experts. It describes the multi-pronged approach that is needed to tackle the issue, including engineering, education and enforcement, and focuses on policy options that are feasible for the BC government to implement. This study recommends implementing a sliding-scale fine, which is expected to improve the targeting of high-risk drivers, address inequities faced by low-income drivers, and act as an overall deterrent for all drivers. Additionally, this study recommends engineering roundabouts in high traffic areas as a longer-term recommendation to indirectly alter driver behaviour.

Keywords: distracted driving; mobile phones; cell phones; British Columbia; behaviour; incidents
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# Table of Contents

Approval .................................................................................................................. ii  
Ethics Statement ..................................................................................................... iii  
Abstract ................................................................................................................... iv  
Acknowledgements .................................................................................................. v  
Table of Contents .................................................................................................... vi  
List of Tables ........................................................................................................... ix  
List of Acronyms ....................................................................................................... x  
Executive Summary ................................................................................................ xi  

## Chapter 1. Introduction ......................................................................................... 1

## Chapter 2. Distracted Driving with Phones in BC .............................................. 3

2.1. What is Distracted Driving? ............................................................................. 3  
2.2. Policy Context .................................................................................................. 3  

## Chapter 3. The Importance of Reducing Incidents Caused by Texting .......... 5

3.1. Negative Effects of Texting While Driving ....................................................... 5  
   3.1.1. Physical ....................................................................................................... 5  
   3.1.2. Visual .......................................................................................................... 5  
   3.1.3. Cognitive .................................................................................................... 6  
3.2. Behaviours that Persist in Drivers Who Text .................................................. 7  
   3.2.1. Risk-taking ................................................................................................. 7  
   3.2.2. Hazard Perception ...................................................................................... 7  
   3.2.3. Compensatory Behaviour ......................................................................... 8  
   3.2.4. Impulsivity .................................................................................................. 9  
   3.2.5. Social Norms ............................................................................................. 9  

## Chapter 4. Methodology ...................................................................................... 10

4.1. Case Studies ..................................................................................................... 10  
4.2. Interviews ........................................................................................................ 12  

## Chapter 5. Case Studies Analysis ..................................................................... 14

5.1. United Kingdom ............................................................................................... 14  
   5.1.1. Policy Description ...................................................................................... 14  
   5.1.2. Indirect Policies ......................................................................................... 15  
   5.1.3. Outcomes and Impacts ............................................................................. 15  
5.2. Sweden ............................................................................................................ 16  
   5.2.1. Policy Description ...................................................................................... 16  
   5.2.2. Indirect Policies ......................................................................................... 16  
   5.2.3. Outcomes and Impacts ............................................................................. 17  
5.3. Alaska ............................................................................................................. 17  
   5.3.1. Policy Description ...................................................................................... 17  
   5.3.2. Indirect Policies ......................................................................................... 17
5.3.3. Outcomes and Impacts ................................................................. 18
5.4. Canada: Ontario, Manitoba and British Columbia .................................. 18
   5.4.1. Policy Description ........................................................................ 18
   5.4.2. Indirect Policies .......................................................................... 19
   5.4.3. Outcomes and Impacts ................................................................. 20

Chapter 6. Interview Findings ........................................................................ 24
6.1. The Three E’s: Education, Enforcement and Engineering ....................... 24
   6.1.1. Education .................................................................................. 24
   6.1.2. Enforcement ............................................................................... 25
   6.1.3. Engineering ................................................................................ 25
6.2. Changing Understanding and Attitudes .................................................. 26
   6.2.1. Changing Views: Incidents as Preventable ..................................... 26
   6.2.2. Changing Views: Phones as an Addiction ...................................... 27
   6.2.3. Changing Older Generations ...................................................... 27

Chapter 7. Policy Objectives and Evaluative Criteria ...................................... 29
7.1. Decrease the Number of Fatal and Serious Injuries .................................. 29
7.2. Decrease the Number of Distracted Driving Tickets ............................... 29
7.3. Distributional Justice .......................................................................... 30
7.4. Public Acceptance ............................................................................. 30
7.5. Legal Complexity ............................................................................. 31
7.6. Cost ................................................................................................. 31

Chapter 8. Policy Options .............................................................................. 34
8.1. Option 1: Status Quo ......................................................................... 34
8.2. Option 2: Sliding-Scale Fine ............................................................... 35
8.3. Option 3: Adding Temporary Suspension and Car Impoundment ............ 36
8.4. Option 4: Engineering Roundabouts .................................................. 36

Chapter 9. Policy Analysis ............................................................................ 38
9.1. Evolving Status Quo ........................................................................... 38
   9.1.1. Reduced Injuries ........................................................................ 38
   9.1.2. Reduced Tickets ......................................................................... 38
   9.1.3. Distributional Justice .................................................................. 38
   9.1.4. Public Acceptance ...................................................................... 39
   9.1.5. Legal Complexity ....................................................................... 39
   9.1.6. Cost ......................................................................................... 39
9.2. Sliding-Scale Fine ............................................................................... 40
   9.2.1. Reduced Injuries ........................................................................ 40
   9.2.2. Reduced Tickets ......................................................................... 40
   9.2.3. Distributional Justice .................................................................. 40
   9.2.4. Public Acceptance ...................................................................... 41
   9.2.5. Legal Complexity ....................................................................... 41
   9.2.6. Cost ......................................................................................... 41
9.3. Temporary Suspension and Car Impoundment ........................................ 42
  9.3.1. Reduced Injuries ........................................................................... 42
  9.3.2. Reduced Tickets ............................................................................ 42
  9.3.3. Distributional Justice ..................................................................... 43
  9.3.4. Public Acceptance .......................................................................... 43
  9.3.5. Legal Complexity .......................................................................... 43
  9.3.6. Cost ............................................................................................... 44

9.4. Engineering Roundabouts ................................................................. 44
  9.4.1. Reduced Injuries ........................................................................... 44
  9.4.2. Reduced Tickets ............................................................................ 45
  9.4.3. Distributional Justice ..................................................................... 45
  9.4.4. Public Acceptance .......................................................................... 45
  9.4.5. Legal Complexity .......................................................................... 46
  9.4.6. Cost ............................................................................................... 46

9.5. Summary of Analysis ......................................................................... 47

Chapter 10. Recommendations ................................................................. 48

10.1. Implementation Considerations ...................................................... 48
  10.1.1. Education ..................................................................................... 49
  10.1.2. Enforcement .................................................................................. 49
  10.1.3. Roundabouts ................................................................................. 50
  10.1.4. Social Construction of Target Populations .................................. 50

Chapter 11. Conclusion ............................................................................. 52

References .................................................................................................. 54

Appendix A. Canadian Distracted Driving Penalties ................................. 60

Appendix B. Scoring Matrix ...................................................................... 61
List of Tables

Table 1. Case Study Selection Criteria ................................................................. 11
Table 2. Case Study Evaluation Framework ...................................................... 12
Table 3. Summary of Case Studies Characteristics ......................................... 22
Table 4. Summary of Evaluative Criteria ......................................................... 32
Table 5. Summary of Policy Analysis Results .................................................. 47
**List of Acronyms**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
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<tr>
<td>AHSO</td>
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Executive Summary

Globally, distracted driving is the 8th leading cause of death and it is predicted to rise, raising concern within the World Health Organization. Since 2011 in British Columbia (BC), distracted driving fatalities are meeting and exceeding the rate of impaired driving fatalities. On average, approximately 78 fatalities occur every year in BC in which distracted driving is a factor.

Since legislation was enacted in 2010, the BC government has updated the distracted driving penalty scheme three times – gradually increasing fines and adding new penalties. BC’s current policy scheme for an initial ticket includes 4 demerit points on a license and a $543 fine; a subsequent fine will result in an $888 fine and an additional 4 demerit points. Despite these changes, approximately 40,000 distracted driving-related citations are issued out annually, revealing that the current policy scheme is inadequate in changing the behaviours of drivers. Drivers continue to remain undeterred from the currently penalties.

This study recognizes that penalties alone will not change the behaviour of all drivers; however, they are effective in deterring a large portion of the general public and should continue to be utilized as a policy. Penalties must work alongside effective and persistent enforcement, as drivers who perceive the likelihood of receiving a ticket as high will avoid using their mobile phones. Alongside enforcement, education and increased awareness is needed to continue to remind drivers, young and old, of the dangers of distracted driving. Policymakers have also used vehicle and road engineering as more innovative methods to tackle the problem. Throughout the research process, it is clear that the best and most effective way of tackling distracted driving is through a multi-prong approach. This study aims to acknowledge the various approaches needed to deter drivers, while highlighting the important of both penalties and road designs in this effort.

Methodology and Results

This study comprises a two-part methodology: a multiple case study analysis and interviews with experts and stakeholders. This study looks at 6 jurisdictions in-depth, including the United Kingdom, Sweden, Alaska, BC, Manitoba and Ontario. Each jurisdiction was examined based on their current policies and their penalties, as well as
their indirect policies that influence driver behaviour. The case studies reveal the various policy schemes jurisdictions have taken in attempt to reduce distracted driving behaviour and include approaches such as criminalized penalties, road design measures and awareness campaigns. Next, interviews were conducted with eleven individuals. These two methods helped inform the following criteria and policy analysis chapters.

**Policy Analysis and Recommendation**

A set of six evaluative criteria were used to compare policy options. These criteria were chosen to assess the extent to which the policy options are expected to achieve multiple objectives as identified throughout the research. The benefits and trade-offs of each option were considered relative to one another. The criteria used are as follows:

- Decrease in serious and fatal injuries;
- Decrease number of tickets written;
- High-low income wealth distribution of impacts of penalties;
- Public support;
- Administrative and legal complexity; and
- Cost to government.

Four policy options were developed for consideration: the current status quo, the sliding-scale fine, adding temporary license suspension and car impoundment, and finally, engineering roundabouts. Based on the analysis of each option, this study recommends two policy options: the sliding-scale fine and engineering roundabouts.

The primary recommendation is to implement the sliding-scale fine across the province. This option can be implemented immediately and could see a change in driving behaviours more immediately. This option would encompass a larger portion of the public to become deterred, as the fines are dependent on each driver’s individual income.

The secondary recommendation is engineering roundabouts. This is a longer-term option, as construction of roundabouts will be more time-consuming, however in the long-run, this option will see a reduction in all types of risky driving behaviours, including distracted driving.
Chapter 1.

Introduction

Globally, vehicular incidents lead to almost 1.3 million deaths and 50 million injuries each year (World Health Organization WHO 2010). Traditionally, these injuries are the result of speeding and impaired driving crashes, however distracted driving incidents and subsequent injuries have escalated. Distracted driving is now the 8th leading cause of death and it is predicted to rise, raising concern within the World Health Organization given the impact on the victim, their families and the strain on the healthcare system (World Health Organization WHO 2010).

Vehicle incidents cost the Canadian economy at least $10 billion every year – and this is only through healthcare costs (CAA National 2018; Government of Canada, Public Health Agency of Canada, and Road Safety Canada Consulting 2011). This cost increases to $25 billion when the social and economic costs are considered, including road maintenance, and familial pain and suffering (CAA National 2018; Government of Canada, Public Health Agency of Canada, and Road Safety Canada Consulting 2011). In British Columbia (BC), the costs associated with deaths and injuries relating to distracted driving incidents are estimated to be $1 billion annually, or 0.5% of BC’s GDP (Office of the Superintendent of Motor Vehicles 2009). Other costs that are not taken into account in this expenditure include costs to families, property, police, and the judicial system (Office of the Superintendent of Motor Vehicles 2009, 17).

In Canada, road laws are made and regulated by the provincial or territorial government. With the exception of Nunavut, all provinces and territories have a law pertaining to the use of electronic devices while driving (R. D. Robertson et al. 2016; see Appendix A). Traditionally, monetary fines and demerit points are used for road offenses; jurisdictions, however, are testing more creative penalties for distracted driving offenses, such as immediate roadside prohibitions (ICBC 2018c). Established penalties are effective because the general public is deterred by these fines and demerit points but their ability to continue to constrain drivers’ actions has plateaued, particularly when it comes to mobile phones (RoadSafetyBC 2018b). Across the country, approximately 26% of crashes are caused by phone use (National Safety Council 2012). This is
highlighted in BC as more British Columbians are killed in distracted driving related-incidents than in impaired driving crashes, with roughly 78 fatalities annually versus 68 (Matthews 2015; ICBC 2018a, 2018b). These two statistics should propel the province to look at new strategies to address this problem.

This project identifies and analyzes policy options that aim to reduce the number of distracted driver incidents caused by mobile phone use in BC. To analyze the nature and causes of the problem, a literature review, case studies, and interviews with experts and stakeholders were conducted. Policy options that aim at decreasing the number of vehicular incidents and injuries have then been identified. The benefits and trade-offs of these four options are assessed by evaluative criteria to compare their effectiveness in reducing distracted driving numbers, as well as their impact on driver freedom, equity between drivers, complexity, and durability. The objective of this project is to provide recommendations to the Government of BC that can be implemented to reduce the number of distracted driving incidents caused by mobile phone use and ensure that road safety remain a priority.
Chapter 2.

Distracted Driving with Phones in BC

2.1. What is Distracted Driving?

Distracted driving is not limited to texting while driving. Distractions include any activity that diverts attention away from driving, impairing judgement on the road and thereby leading to riskier or compensatory behaviours (R. Robertson 2011; Young and Regan 2007). According to BC law, distracted driving is any activity that impacts a driver’s ability to focus, and includes visual and cognitive distractions (RoadSafetyBC 2018a). Since the late 2000s, jurisdictions have focused on electronic devices; however, there are many other distractions that exist, including eating or drinking, adjusting the radio, reading billboards and even talking to passengers. Many distractions are common driving habits and difficult to avoid and are thus unlikely to be banned in the future. The use of a mobile phone is viewed as an unnecessary behaviour that can be changed, and it has taken priority in policy over these other aforementioned distractions.

2.2. Policy Context

In January 2010, BC’s Motor Vehicle Act, Part 3.1 came into effect, banning mobile phone and electronic use while driving (CBC News 2013). At the time, drivers faced a maximum fine of $167 (CBC News 2013). In this initial year, the BC RCMP reported 104 distracted driving-related fatalities (Government of Canada 2011). From 2010 to 2014, approximately 40,000 distraction citations were issued annually, which perpetuated the notion that the existing penalty design did not produce effective change in driver behaviour (Morton 2014; R. Robertson and Bardswick 2016). In 2014, Attorney General Suzanne Anton declared that the $167 fine was too low and promised tougher penalties (CBC News 2015). Subsequently thereafter, penalties were amended to include a possible 4-point demerit (CBC News 2015). In June 2016, Anton’s promise was further fulfilled with fines and insurance premiums adding up to a maximum $543 for the first infraction and includes automatic demerit points on licenses; repeat offenders face escalating penalties to upwards of $888 (RoadSafetyBC 2018a).
The current law bans the handling of a mobile phone, as this is a manual task that decreases a driver’s ability to operate a vehicle safely (Atchley, Tran, and Salehinejad 2017). This law has been positive for officers as it allows great flexibility for enforcement to catch offenders; police are often unable to detect from afar whether a driver is using their phone or simply holding it and this broader definition permits officers the leniency to identify offenders (Neil Arason, Interview). This law does, however, permit drivers to use their phones when the vehicle is pulled to the side (ICBC 2018a). As an alternative, the government has encouraged hands-free devices such as Bluetooth technology (ICBC 2018a). The law thus targets the physical act of holding a phone as technological advancements, such as these hands-free devices, have arguably mitigated some of the dangers of talking on the phone (Young and Regan 2007; National Safety Council 2012).

The use of mobile phones while driving is a behavioural problem. While the problem is dependent on an individual’s own understanding of risk and awareness, when many individuals share this mentality of phone use as low-risk, it becomes a public safety and road safety issue. Despite BC increasing penalties as a result of continued defiance, phone use continues to persist (ICBC 2018a). Fines are seen as “the cost of doing business” for many, particularly as drivers believe there is a low likelihood of receiving a ticket (R. Robertson and Bardswick 2016, 43). Policymakers need to look beyond traditional policies to better decrease the risk of incidents caused by phones.
Chapter 3.

The Importance of Reducing Incidents Caused by Texting

3.1. Negative Effects of Texting While Driving

The dangers of texting while driving are threefold: it impacts and impairs drivers visually, cognitively and physically (Caird et al. 2014; Atchley, Tran, and Salehinejad 2017). One simulator study revealed that the probability of a vehicular incident increases 8.3 times more when a driver is texting (Yannis et al. 2014). In this circumstance, the act of driving is the primary activity, whereas texting is the secondary action that takes away focus from the former. Individuals have a limited amount of attentional resources and performing a secondary task causes a redistribution of attention from the primary to the secondary task, which can lead to unsafe driving practices.

3.1.1. Physical

The act of touching and manipulating a mobile phone involves the use of hands, and directly interferes with a driver’s lateral vehicle control (Caird et al. 2014). Simulator and observational testing show that drivers will either hold the phone against the steering wheel and text with both hands or will hold the device in one hand and the wheel in the other (Caird et al. 2014). A simple task such as staying in the correct lane is difficult in this circumstance as it is harder to maintain control without both hands purposefully on the steering wheel (Caird et al. 2014). In order to correct for vehicle control when drifting, corrections need to be done quickly and this requires a level of cognitive thinking, which is also impaired.

3.1.2. Visual

Texting requires individuals to both read a screen and type on a keyboard, and this creates a visual impairment while driving. Research shows that drivers miss up to 50% of the information in their driving environment when distracted by their phones, and for a task that requires full visual capacity, missing any information can result in a crash
Texting on mobile devices requires both visual and physical senses, and often leads to short and frequent glances between the road and the phone. The research finds that glances exceeding 1.6-2.0 seconds significantly increases the risk of crashing (Caird et al. 2014). Drivers who text also have slower responses to danger and have more difficulty controlling their vehicles, and as a result, are more likely to be involved in crashes (Caird et al. 2014). These drivers also present a danger to other road users as delayed responses affect everyone on the road. Drivers may brake last-minute and hit cars ahead of them or they may brake abruptly causing drivers behind them to react defensively. Research shows that the longer the text conversation goes on, the more visually distracted the driver is and the more likely they will be involved in an incident (Caird et al. 2014).

When a driver attempts to hide their behavior, they are further impairing their sight. In comparison to holding the phone on the wheel, the act of hiding the phone ensures that the device is out of eyesight; this is also dangerous as the driver no longer has full vision of the road (RoadSafetyBC 2018a).

### 3.1.3. Cognitive

Drivers overestimate their ability to multitask, and this is further heightened by a false sense of security in their road environment. Multitasking is mistakenly thought to be the ability to complete multiple tasks simultaneously and quickly, when it is in fact about the ability to pay attention and focus on various tasks while completing them successfully (Rosen 2008). This idea of multitasking is contrary to how drivers should behave on their road as research shows that individuals are most efficient and successful when they focus solely on one task (Rosen 2008). As driving requires complete focus, the additional task of texting greatly increases the risk of crashing and causing serious and fatal injuries. Dangers and hazards can appear quickly and there is a cognitive time-delay when switching from texting while driving to simply driving; this lag can be the difference between avoiding and causing an incident (Rosen 2008). Policymakers have attempted to mitigate this multitasking mentality through laws and penalties however compliance levels and reduced incidence rates are not yet satisfactory.
3.2. Behaviours that Persist in Drivers Who Text

Texting while driving is a personal behavioural choice. Some individuals choose to avoid using their phones, while others do not, and this can be explained by individual behaviours and beliefs. The five behaviours of risk-taking, hazard perception, compensatory behaviour, impulsivity and social norms help explain the motivation as to why some drivers participate in this risky behaviour.

3.2.1. Risk-taking

Drivers are aware of the risks associated with texting, yet this has neither prevented nor deterred many individuals from halting this behaviour. How individuals perceive risk is both a cognitive and a behavioural problem and the decision for a driver to look at their phone occurs because of their own perception of their safe road environment (Bayer and Campbell 2012). This is explained best through the risk perception attitude (RPA) framework, where it is recognized that risk alone is not an effective deterrent for self-protective actions (Dillow et al. 2015). According to RPA, perceived risk and strong efficacy beliefs are needed for individuals to avoid risky behaviour (Dillow et al. 2015). These beliefs are weak as drivers have a low perception towards enforcement and risk, and this has led to a sense of indifference (Dillow et al. 2015). The prevailing number of individuals who continue to text while driving reveals how many continue to perceive the risk to be low (ICBC 2018a).

3.2.2. Hazard Perception

Akin to risk-taking, hazard perception is a strong measure of driver safety. Hazard perception is a driver’s ability to detect risky and dangerous road situations both immediately and in the future (Horswell and McKenna 2004; Burge and Chaparro 2012). Drivers who text acquire inattentional blindness, where hazards can be missed because of divided attention and because of added workload (Burge and Chaparro 2012). Research shows that drivers have slower reaction times and are more prone to miss hazards when they are texting, in comparison to when their baseline driving (Burge and Chaparro 2012). Driving is an active anticipatory activity and when one’s hazard perception is skewed, incidents are more likely to occur.
3.2.3. Compensatory Behaviour

When a driver is distracted, an individual may consciously or unconsciously adopt compensatory behaviours in attempt to mitigate their risky behaviour. In particular to distracted driving, exhibiting compensatory behaviours are an individual’s way of rationalizing this unsafe behaviour and is also a form of self-regulation (Caird et al. 2014; Choudhary and Velaga 2017). However, this can be more dangerous than the risky behaviour itself. Research shows that drivers who text tend to partake in two different compensatory behaviours: they will reduce their speed or leave a larger headway space between vehicles (Caird et al. 2014; Choudhary and Velaga 2017). This is an attempt to partially compensate for the fact that the driver is not fully focused on the road, and is thus participating in what they consider safe driving strategies (Caird et al. 2014). While this may seem safe, it creates additional dangers for the drivers around them.

Readjusting speed is the most common compensatory behaviour. Speed is the cause of most incidents, and the level of severity of an incident is dependent on the rate of acceleration (Choudhary and Velaga 2017; R. Robertson 2011). Despite research showing that texting and driving leads to reduced speeds, this change in speed remains a contributory factor in incidents (Caird et al. 2014; Choudhary and Velaga 2017). As reducing speed can go against the flow of traffic, this can cause trailing drivers to react more defensively (Caird et al. 2014). In comparison to talking on the phone, texting requires more cognitive capacity as individuals must read and write messages. As a result, texting increases the driver’s capacity, leading to slower speeds to compensate for this added task.

Drivers may alternatively compensate for texting by leaving more headway space between their car and the cars in front of them. This increased space gives individuals a sense of safety, as drivers have more time to adjust for potential incidents; however research and experiments prove that this does not sufficiently compensate for the time spent glancing away and the slower reaction times (Caird et al. 2014; Young and Regan 2007). On the opposite side of the spectrum, studies find that some distracted drivers end up tailgating cars, which is also a danger (Horsman and Conniss 2015). Ultimately when it comes to texting and driving, there is no ideal amount of headway space that should be left between cars; leaving either too much or too little is problematic in terms of slowed reactions times, and the only acceptable solution is to avoid using the phone.
3.2.4. Impulsivity

Research shows that impulsivity is a common personality trait in drivers who text (Hayashi, Russo, and Wirth 2015). Impulsivity is defined as the lack of premeditation, and in regards to distracted driving, it is the unplanned use of one’s phone while driving (Pearson, Murphy, and Doane 2013). Most individuals do not drive with the mindset that they will be breaking the law - drivers make the impulsive choice to pick up their phone in the moment. This impulsivity is motivated by the “smaller immediate rewards [rather than the] larger delayed rewards” (Hayashi, Russo, and Wirth 2015, 183). The short-term reward is a text message, whereas the long-term, delayed reward would potentially be a more fulfilling conversation with the recipient. Viewing these actions through a behaviour analysis approach, it is clear that individuals are participating in active discounting when they use their phone (Shaffer 2010). Active discounting occurs as an individual’s time preference rate of immediate benefits outweigh the delayed benefits and thus compels them to text while driving (Shaffer 2010). Drivers who text thus do not consider the consequences of their action.

3.2.5. Social Norms

Distracted driving research often reflects on the evolution of impaired driving and its present status as an accepted social norm (Government of Canada, Public Health Agency of Canada, and Road Safety Canada Consulting 2011; World Health Organization WHO 2010). As impaired driving laws did not realize any immediate behavioural effect, there is concern that distracted driving policies may repeat the same fate (R. D. Robertson et al. 2016). Social norms against drunk driving played a significant role in decreasing impaired driving, as public acceptance of the ban increased over decades. While texting and driving is viewed negatively in public, this view is not yet inherent to motivate all drivers to stop. Research does show that it will become ingrained in society, although it may take several generations (R. D. Robertson et al. 2016).

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1 Discounting occurs when individuals ‘discount’ things that will happen in the future as less important than the things that occur presently. This is highlighted through the preference of immediate gratification.
Chapter 4.

Methodology

This study comprises a two-part methodology: a multiple case study analysis and interviews with experts and stakeholders. These methods are used to understand the nature and causes as to why drivers use their phone and to identify appropriate policy options to reduce the number of incidents. Lastly, the methods will help analyze the effectiveness, feasibility and trade-offs of these various approaches.

4.1. Case Studies

This study looks at 6 jurisdictions in-depth: the United Kingdom, Sweden, Alaska, BC, Manitoba and Ontario. The analysis explores the characteristics of each distracted driving policy and evaluates the different models. Each jurisdiction is chosen due to their legislations and policies on mobile phones. Research was found based on publicly available information, including journal articles, government websites and news articles. The jurisdictions are evaluated on their level of success in minimizing the number of distracted driving incidents. Table 1 provides an overview of the explored criteria and how each jurisdiction compares to BC.

No case study has eliminated distracted driving-related fatalities entirely. Among these case studies, BC has one of the highest numbers of fatalities, with only Alaska having more fatalities at almost double the rate. There is variation among the case studies as to what level of government decides road safety policy, and in Canada and the United States, it is in the hands of the sub-national governments. In the United Kingdom and Sweden, road safety is under the responsibility of the national government. In each of the cases, how the policy is framed provides a useful starting point for comparison.
### Table 1. Case Study Selection Criteria

<table>
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<tr>
<th>Jurisdiction</th>
<th>Distracted Driving Program Model</th>
<th>Regulatory Regime</th>
<th>Geographic Terrain</th>
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<td>Provincial</td>
<td>Mountainous</td>
<td>5.73 (2017)</td>
</tr>
<tr>
<td>Manitoba</td>
<td>Policy</td>
<td>Provincial</td>
<td>Lowlands</td>
<td>5.46 (2017)</td>
</tr>
<tr>
<td>Ontario</td>
<td>Policy</td>
<td>Provincial</td>
<td>Plateaus and low hills</td>
<td>2.54 (2016)</td>
</tr>
<tr>
<td>Alaska</td>
<td>Policy</td>
<td>State</td>
<td>Mountainous</td>
<td>11.35 (2016)</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Policy</td>
<td>National</td>
<td>Mountainous and plains</td>
<td>2.71 (2015)</td>
</tr>
<tr>
<td>Sweden</td>
<td>Policy</td>
<td>National</td>
<td>Mountainous and lowlands</td>
<td>2.70 (2016)</td>
</tr>
</tbody>
</table>

Department for Transport (2016), “Reported Road Causalties in Great Britain: Main Results 2015.”

There are three dimensions in this evaluation framework: policy characteristics, indirect influences, and policy outcomes. Understanding the features of each individual policy provides insight into their respective framing. Secondly, other indirect influences that impact driver behaviour are also explored, such as road design and enforcement. Thirdly, the outcomes and impacts of each policy will be used to evaluate the success of each case study. Table 2 outlines this analysis framework and defines the qualitative measures to evaluate them.
Table 2. Case Study Evaluation Framework

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristics of the Policy</td>
<td></td>
</tr>
<tr>
<td>Policy Structure</td>
<td>What is the policy?</td>
</tr>
<tr>
<td>Age Exceptions</td>
<td>Are young drivers targeted differently?</td>
</tr>
<tr>
<td>Year of Implementation</td>
<td>When was the policy first implemented?</td>
</tr>
<tr>
<td>Penalties</td>
<td>Are there penalties beyond a monetary fine for a first offence?</td>
</tr>
<tr>
<td>Exemptions</td>
<td>Are there exemptions to the policy?</td>
</tr>
<tr>
<td>Indirect Influences</td>
<td></td>
</tr>
<tr>
<td>Enforcement Level</td>
<td>Is enforcement high, visible and maintained?</td>
</tr>
<tr>
<td>Public Support</td>
<td>Is there public support for distracted driving laws?</td>
</tr>
<tr>
<td>Awareness Campaigns</td>
<td>Is there strong investment towards public campaigns?</td>
</tr>
<tr>
<td>Road Design</td>
<td>Has the jurisdiction used road design to decrease distracted driving?</td>
</tr>
<tr>
<td>Technology</td>
<td>Does the jurisdiction allow for hands-free devices?</td>
</tr>
<tr>
<td>Other Laws that may Influence</td>
<td>Are there other policies that may influence drivers from refraining to use their mobile phones?</td>
</tr>
<tr>
<td>Outcomes and Impacts</td>
<td></td>
</tr>
<tr>
<td>Change in Number of Incidents</td>
<td>Has there been an increase or decrease in number of reported distracted driving incidents?</td>
</tr>
</tbody>
</table>

4.2. Interviews

Qualitative interviews with experts and stakeholders were used as the second methodology. Interviews were conducted either in-person or over the phone, depending on the location of the interviewee, and were recorded for note-taking purposes, unless otherwise specified. The interviews were semi-structured, and questions varied per the expertise, background and experience of each interviewee. Eleven interviews were conducted overall with the following individuals:

- **Neil Arason**, Director, Injury Prevention and Healthy Settings, Ministry of Health
- **Mark Milner**, Program Manager, ICBC
- **Participant 3**, Senior Policy Analyst, The Fraser Institute
- **Sarah Leamon**, Criminal Defense Lawyer, Sarah Leamon Law Group
- **Robert Voas**, Pacific Institute for Research and Evaluation
- **Participant 6**, Traffic Injury Research Foundation
- **Dr. Lanny Zrill**, Sessional Lecturer, University of British Columbia
- **Karen Klein**, Road Safety & Community Communicator, ICBC
- **Participant 9**, Media Relations Officer, RCMP
• Dr. Ian Pike, Director, BC Injury Research and Prevention Unit

• Participant 11, Traffic Services, RCMP

Interviews were used to further understand the difficult process of reducing mobile phone use while driving, to identify possible policy options to tackle the problem, and to understand the benefits and challenges relating to each option in order to support the policy analysis portion of the study. Interviews were used to support and provide clarification on information contained within the existing literature and helped to fill in gaps and make predictions when information was not available.
Chapter 5.

Case Studies Analysis

This chapter examines the distracted driving policies in six selected cases: BC, Manitoba, Ontario, Alaska, the United Kingdom and Sweden. For each case, the distracted driving policy legislation, the indirect policies that influence behaviour and the outcome of the legislation are stated. From this analysis, successful characteristics are identified.

5.1. United Kingdom

5.1.1. Policy Description

Since 2003, the United Kingdom (UK) has banned the use of mobile phones while driving (RAC 2018b). More specifically, this includes texting, touching or holding the device, and using it as a global positioning system (GPS). Drivers must remain in control of their vehicle when the engine is running, and this includes at traffic stops and in traffic queues (RAC 2018b). The policy goes a step further as those supervising learner drivers cannot use their phones either, as the instructor is responsible for the car and thus, all road laws apply to the instructor (RAC 2018b). There are only two conditions in which a driver may use their phone: when safely parked, or to call emergency services “but only if it’s not otherwise safe to stop” (RAC 2018b, para. 15).

In 2017, the UK updated the severity of their penalties. A first-time offender faces a fixed penalty notice of £200 ($340 CAD) and 6 points on their license (RAC 2018b). In the UK, a driver only needs 12 points on their license for it to be revoked (RAC 2018b). For drivers with less than 2 years of experience, a 6-point deduction results in an automatic revocation of their license (RAC 2018b). If the driving and distraction are deemed significantly dangerous, police have the power to take the driver to court, where they can face a maximum fine of £2,000 ($3,402 CAD) and lose their license (RAC 2018b).
5.1.2. Indirect Policies

Prior to the newly updated penalties, attitudes towards distracted driving relaxed as phone use increased amongst drivers. Notably, there was a reduction in full-time police officers dedicated to traffic and road violations, from 123,000 in 2010, to 17,000 in 2015, leading to less visible enforcement (Wallace 2017). The RAC campaigned for stiffer penalties because of this change as a tactic for changing behaviours (RAC 2018b). The public supported these new penalties, with 80% of drivers agreeing with the punishment, while 35% stated that they remain too lenient (RAC 2018b). Before these revisions, drivers had the option of attending educational courses in lieu of penalty points or a fine (RAC 2018b). Drivers no longer have this option, however senior policy officers have expressed interest in renewing this as officers view education as an effective source of changing behaviour (RAC 2017).

The UK currently allows for hands-free devices, voice command and built-in satellite navigation systems to be used while driving and all these devices must be set-up prior to operating the vehicle.

Road design has indirectly affected distracted driving behaviours as well, with the installation of roundabouts and traffic light cameras in congested areas having a positive effect (Just Landed n.d.). Roundabouts have been used in road design to maintain slow speeds and ensure driver attentiveness and have had positive spill-over effects in reducing phone use (Neil Arason, Interview).

5.1.3. Outcomes and Impacts

Compliance continues to remain a problem in the UK and the rise in penalties is evidence that the government is unsatisfied with the behaviour of drivers (RAC 2018b). In 2015, officers in Wales issued over 85,000 traffic offense reports for phone use alone (RAC 2017). In 2017, 33 people were fatally injured due to mobile phone use – this is an increase from 2016 when 22 individuals died (RAC 2018a).

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2 The RAC is a UK motoring organization, and includes services such as roadside assistance, insurance, buying cars and vehicle inspections. It is viewed as the voice of UK motorists.
5.2. Sweden

5.2.1. Policy Description

In early 2018, Sweden passed their first mobile phone-related driving ban (The Local SE 2018). This law makes it illegal for drivers to be holding a mobile device in the car, and can result in a 1,500 kr ($219 CAD) fine (The Local SE 2018). The law does not, however, ban the use of phones entirely as drivers can continue to text and call with hands-free technology (The Local SE 2018). Prior to 2018, the country did not have a specific ban targeting mobile devices, rather an existing 2013 law banning ‘detrimental’ driving encompassed phone use (The Local SE 2017). This law permitted drivers to use their phones as long as the driving was considered safe, by police officer standards. Although Sweden had success with reducing phone-related incidents with the 2013 law, this new policy aligns Sweden with other nations and international organizations that recognize the dangers of mobile phone use while driving (Kircher et al. 2013).

5.2.2. Indirect Policies

Sweden continues to exhibit low numbers of vehicle incidents and fatality and this can be attributed to their road infrastructure (Statista 2019; Center for Active Design 2014). In 1997, the Swedish government adopted the concept of Vision Zero, a belief where any loss of life as a result of motor vehicles is unacceptable (Center for Active Design 2014). By focusing on road design, technology and enforcement to reduce incidents, Vision Zero shifts the fault away from the drivers (Center for Active Design 2014). Sweden has specifically focused on the road design aspect of this approach, and have installed numerous roundabouts, street cameras and physical lane barriers to minimize risky behaviours and reduce road fatalities.(Center for Active Design 2014). As Sweden implemented these road designs to address dangerous behaviours decades earlier, the country has benefited as mobile phone use has also been indirectly impacted.

As a result of existing road design naturally reducing mobile phone use, the Swedish government has chosen to place their focus and funds towards public awareness campaigns (Wallace 2017). More recently, Volkswagen in Sweden has partnered with a phone case company to build cases out of damaged vehicles from
mobile phone-related incidents; this initiative aims to bring more awareness to the salience and dangers of using phones while driving (Gustafson 2018).

5.2.3. Outcomes and Impacts

As road design targets all types of risky driving behaviour, the implementation of Vision Zero has led to a reduction in all vehicle-related incidents, and this is evident in Sweden as road fatalities have decreased from 445 to approximately 270 deaths in 2016, over a ten-year period (Statista 2019). This number includes the decrease in phone related-incidents, as mobile phone use practices are indirectly impacted through this design. There is currently insufficient data to show the impact of the new legislation banning the holding of mobile phones due to its recent implementation, but it is expected that phone-related incidents will continue to decline in the future (The Local SE 2018).

5.3. Alaska

5.3.1. Policy Description

Alaska continues to have one of the steepest distracted driving penalties worldwide despite loosening them in 2016. The policy specifically bans texting while the vehicle is in motion and differs from the other examined jurisdictions as it permits drivers to use their devices for calls (Alaska State Legislature 2013). Previously, texting while driving led to a misdemeanour fine of $10,000 and up to 1 year in prison (Crittenden Law Office 2016). If an injury occurred, the fine increased to $100,000 and up to 10 years in prison (Crittenden Law Office 2016). City officials in Anchorage challenged these penalties as they found it difficult to convict drivers of a misdemeanour charge and thus passed legislation changing the violation to a minor offense; Alaska followed suit in 2016 with Senate Bill 123 (Kelly 2016). This bill significantly lowered the penalties, changing from a $10,000 fine to $500, however this only applies in situations when no one is physically or fatally injured (Kelly 2016).

5.3.2. Indirect Policies

The Alaskan Highway Safety Officer (AHSO), in partnership with the Alaska Injury Prevention Center, continues to create yearly media campaigns targeting various
driving behaviours (Alaska Highway Safety Office n.d.). The most common messaging mediums utilized are television ads and radio, as the AHSO can aggressively target individuals both at home and on the road (Alaska Highway Safety Office n.d.). In addition, distracted driving campaigns are heightened throughout the year when they coincide with national enforcement blitzes (Alaska Highway Safety Office n.d.).

On a municipal level, Anchorage has adopted Vision Zero in attempt to decrease fatalities through road design and in this understanding, the city appears to be seizing more control over the state to reduce vehicle incidents in their jurisdiction (Kelly 2016).

5.3.3. Outcomes and Impacts

Current driving laws in Alaska have been unsuccessful in reducing traffic fatalities, as the number of deaths have increased from 56 in 2015 to 84 in 2016 (Klint 2016; Alaska Highway Safety Office 2017). It is unclear as to how many of these fatalities are mobile phone-related, but given the relatively small population of Alaska and that approximately 11 road fatalities per 100,000 individuals occurs annually, there is room for improvement to reduce distracted driving (Alaska Highway Safety Office n.d.; see Table 2). There is also growing concern that the Alaskan law is weak in reducing distracted driving behaviours as it allows for drivers to use hand-held devices for calling purposes.

5.4. Canada: Ontario, Manitoba and British Columbia

5.4.1. Policy Description

As of 2010, Ontario, Manitoba and British Columbia (BC) have implemented driving policies relating to mobile phone use, banning all forms of hand-held communication devices (Hands Free Info 2019). Drivers are unable to hold or operate their devices, and this includes the operating of a GPS. BC is the only province examined in which drivers in the Graduated Licensing Program (GLP) are not permitted to use hands-free devices in any circumstance (RoadSafetyBC 2018a).

In November 2018, Manitoba updated their penalties to an automatic 3-day license suspension, $672 fine and 5-demerit points on a first distracted driving offense
Police officers can issue a temporary license for the offender to drive their vehicle home, in which the suspension begins immediate thereafter (CBC News 2018b). In January 2019, under the Making Ontario’s Roads Safer Act, Ontario will update their penalties to an automatic license suspension for drivers charged with distracted driving (CBC News 2018a). Depending on the number of convictions, this suspension can last between 3 to 30 days, and will also include a fine of $490-1000 and an automatic 3-point demerit on the license (CBC News 2018a). BC updated their penalties in 2016, increasing a first-time offence fine to $543 and 4-demerit points, and a second offence to $888 and 4-demerit points (RoadSafetyBC 2018a). More recently, ICBC has included distracted driving infractions as part of the Driver Risk Premium (DRP)³.

In all three provinces, there are two exceptions in which a mobile phone can be used in a vehicle: calling 9-1-1 in an emergency situation or when the vehicle is pulled over, out of the way of traffic and is lawfully parked.

5.4.2. Indirect Policies

According to law enforcement participants, Canadian police officers have implemented unique ways to catch distracted drivers including dressing up as panhandlers, driving in elevated SUVs and placing officers on buses. Policing organizations have also conducted enforcement blitzes that crackdown on various dangerous driving behaviours, including speeding and distracted driving (CBC News 2013). Police have limited resources outside these tactics, however insurance companies like ICBC and Manitoba Public Insurance (MPI) do fund and support traffic safety enforcement programs. ICBC recently announced an increase to their 2019 traffic safety enforcement budget to $24.8 million, further emphasizing BC’s commitment to reducing risky driving behaviours (Zussman 2018).

On a federal level, the government has implemented national youth campaigns targeting mobile phone use, including the Drop it and Drive campaign (R. D. Robertson et al. 2016). Other important stakeholders such as the provincial government, police and insurance companies have also created their own public education and awareness

³ In BC, if a driver is charged with two or more infractions over 3-years, they are declared a high-risk individual and their premium will increase substantially under the DRP.
campaigns. The Ontario government has been cognisant that awareness campaigns must be launched and carried Bill 171 in 2017, further ensuring that messaging is implemented annually to raise attention to texting and driving (Baker 2017). In Manitoba, high school students learn to drive as part of their coursework, allowing campaigns to target youths directly.

Canada as a nation has implemented a safe systems thinking approach to vehicular incidents and the provinces have also taken steps in this approach (Neil Arason, Interview; further defined in 6.1.3). In 2017, the Ontario Safer School Zones Act passed, giving municipalities the resources to tackle dangerous driving behaviours. The mayor of Victoria is considering reducing driving speeds in low-traffic areas to 30 km/hr to prevent serious injuries and deaths (Cleverley 2018). While not specifically focusing on distracted driving, Vision Zero has had positive impacts on reducing vehicular incidents overall.

Distracted driving is a serious infraction however drivers can be charged with more severe offenses with even steeper penalties in various situations. Depending on the officer’s discretion and the severity of the distraction, drivers may be charged with dangerous driving or careless driving. Under the Canadian Criminal Code, the offense of dangerous driving applies nation-wide and occurs when a driver drives without regard for the public safety of others. This charge is punishable to a maximum of 5-years in prison and can increase up to 10-14 years if found guilty of causing bodily harm or death (Criminal Code of Canada 1985). Alternatively, the charge of careless driving, which is driving without due care and attention to other drivers, is not criminal. In BC, this results in a $368 fine and 6-demerit points (ICBC n.d.). Both these offenses provide further incentive for individuals to drive safely.

5.4.3. Outcomes and Impacts

Distracted driving fatalities and injuries remain problematic in Canada. In Ontario, one person is injured every half hour due to distracted driving (Government of Ontario 2019). In BC, approximately 78 people are injured or killed annually because of distracted driving (ICBC 2018a). Distracted driving-related collisions tripled between 2012 and 2017 in Manitoba, with over 15,400 incidents in 2017 (Manitoba Public Insurance 2017). Looking at these three Canadian provinces reveals how each have
attempted to reduce distracted driving-related incidents, while also showing that there is room to improve.
Table 3. Summary of Case Studies Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Measure</th>
<th>British Columbia</th>
<th>Manitoba</th>
<th>Ontario</th>
<th>Alaska</th>
<th>United Kingdom</th>
<th>Sweden</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Descriptive Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Policy Structure</td>
<td>What is the policy?</td>
<td>Bans use of hand-held electronic devices while driving or</td>
<td>Bans the use of a hand-held electronic device while driving</td>
<td>Bans the use of a hand-held electronic while driving</td>
<td>Bans texting</td>
<td>Bans the use of hand-held mobile phones while driving</td>
<td>Bans the holding of a mobile phone</td>
</tr>
<tr>
<td>Age Exceptions</td>
<td>Are young drivers targeted differently?</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year of Implementation</td>
<td>When was the policy first implemented?</td>
<td>2010</td>
<td>2010</td>
<td>2010</td>
<td>2012</td>
<td>2003</td>
<td>2018</td>
</tr>
<tr>
<td>Penalties</td>
<td>Do the penalties go beyond a monetary fine?</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exemptions</td>
<td>Are there exemptions to the policy?</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Indirect Policies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enforcement Level</td>
<td>Is enforcement high, visible and maintained?</td>
<td>Med</td>
<td>Med</td>
<td>Med</td>
<td>N/A&lt;sup&gt;4&lt;/sup&gt;</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Public Support</td>
<td>Is there public support for distracted driving laws?</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

<sup>4</sup> Alaska does not provide state data for distracted driving tickets.
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Measure</th>
<th>British Columbia</th>
<th>Manitoba</th>
<th>Ontario</th>
<th>Alaska</th>
<th>United Kingdom</th>
<th>Sweden</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road Design</td>
<td>Has the jurisdiction used road design to decrease distracted driving?</td>
<td>Med</td>
<td>Med</td>
<td>Med</td>
<td>Med</td>
<td>Med</td>
<td>High</td>
</tr>
<tr>
<td>Technology</td>
<td>Does the jurisdiction allow for hands-free devices?</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Other Laws that may Influence</td>
<td>Are there other policies that may influence drivers from refraining to use their mobile phones?</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Outcomes and Impacts</td>
<td>Change in Number of Incidents</td>
<td>↓</td>
<td>↑</td>
<td>↓</td>
<td>↑</td>
<td>↑</td>
<td>↓</td>
</tr>
</tbody>
</table>
Chapter 6.

Interview Findings

6.1. The Three E’s: Education, Enforcement and Engineering

There is no simple approach to reducing distracted driving; it needs to be executed on multiple fronts. Dr. Ian Pike, director of the BC Injury Research and Prevention Unit, refers to the multipronged approach as the Three E’s: enforcement, education and engineering. Interviewees recognize that focusing on one aspect will not create change in public behaviour, and also acknowledge that all features must work in cooperation with one another to be effective.

6.1.1. Education

Interviewees express varying concerns on the effectiveness of educational awareness campaigns, but all agree on their necessity. Campaign messaging needs to continue to educate individuals of the consequences of distracted driving, however focus should not remain on the traditional gruesome, tragic scenes that have been used in the past. Individuals ignore or become immune to these campaigns because they view them as unrealistic to their own personal situation. From experience with drugs and drinking campaigns, interviewees find fear-based appeals as ineffective and can lead to an increase in risky behaviour. As Participant 6 says:

[Individuals] tend to tune out and dismiss those messages because they are inconsistent with their personal perceptions and values. [This can motivate more drivers to] to engage in risky behaviours.

Instead, campaigns need to shift focus onto the threat of fines, loss of license, the increase in premiums, and what road safety looks like overall. Most interviewees agree that more effective advertisements and messaging will need to convey consequences that are more on par with reality. Interviewees suggest that campaigns on more pragmatic consequences, such as losing a license, can be a more persuasive
deterrent than tragic imaging; however, this information has yet to be communicated adequately to the public.

6.1.2. Enforcement

In combination with education, interviewees believe enforcement can act as an effective deterrent, but only when used appropriately and purposefully. A law is ineffective and defied when enforcement is absent, and this has been the problem in BC. For most drivers, the presence of visible enforcement alone is a strong deterrent, as these individuals are not keen on the possibility of receiving a penalty. Interviewees find BC enforcement inadequate overall, as the policing agencies lack the capacity that is required to deter drivers effectively. One interviewee specifically mentioned how their Metro Vancouver city has only 2 full-time, on-duty, dedicated traffic enforcement officers working at any given time. BC is simply lacking the sufficient number of traffic cops to provide the required level of enforcement that would make a difference. Due to this under-resourced necessity, one interviewee believes that the solution may involve technology, as adding more traffic enforcement officers is unlikely to happen due to budget constraints.

6.1.3. Engineering

Lastly, interviewees spoke on how road and vehicle engineering could reduce distracted driving incidents. According to many participants, policymakers need to remove the human element from the equation as human error is a natural occurrence that cannot always be prevented. Instead, most interviewees argue that policies should focus on road design, technological advancements and market mechanisms. As Neil Arason states:

As much as you can, you [need to] limit the influence of the driver. In fact, with all road design measures and vehicle design measures, you are taking the driver out of the equation to some extent, or at least [removing] the impact that the driver can have on crash severity. Even if the error happens, you do not allow the consequences of the error to cause a fatality or serious injury. That’s the essence of safe systems thinking.

One solution discussed is the use of technology and its importance in reducing distracted driving-related crashes. Some interviewees argue that newer models of cars
have lane control and collision avoidance systems, and with advancements to automated vehicles, vehicle manufacturers will play an important role in reducing crashes in the future (Eisenstein 2018). Other interviewees remain sceptical in the ability of car manufacturers, as they are ultimately motivated and constrained by their consumers. Manufacturers respond to consumer demand, and as consumers prefer on-boarding technology, they are often unaware of the potential distractions arising from these add-ons.

Another perspective to consider is how technology is not accessible to everyone. While the majority of individuals have cellphones that include voluntary bricking technology, Bluetooth devices and on-board vehicle technology are not as accessible or affordable. Individuals who can afford these upgrades may be safer in that they are using hands-free devices instead of hand-held, but these are primarily available in newer models or are an extra expense. As Sarah Leamon explains:

To a certain extent, technology can help, but again technology isn’t accessible to everybody. Most people can’t afford a brand-new car; most people can’t afford [on-boarding technology] so maybe it’s making that kind of technology more accessible.

Some participants also express caution towards relying too heavily on technology, as it can create a larger distraction. While most interviewees were referring to on-boarding technology in this regard, hands-free devices are also distracting. Even though BC law permits drivers to use Bluetooth devices, the belief that hands-free devices are safer than handheld devices is inaccurate. Research shows that they are equally distracting and cause an increase in cognitive stress, and this was also reiterated throughout the interviews (Atchley, Tran, and Salehinejad 2017).

6.2. Changing Understanding and Attitudes

6.2.1. Changing Views: Incidents as Preventable

Individuals need to understand that serious incidents can occur at any time, however many of these can be prevented. Through his work at Preventable, Dr. Ian Pike and his team are creating awareness campaigns that remind individuals to avoid
engaging risky behaviour. This entails appealing to drivers as rational, sensible and intelligent, rather than accusing and shaming them for participating in harmful behaviour. By excluding the adverse consequences of texting and driving in campaigns, the messaging will appeal to the larger population, and can works towards creating a social norm.

### 6.2.2. Changing Views: Phones as an Addiction

Many interviewees view phones as highly addictive and compare it with addictive behaviours such as gambling and gaming. Using a phone requires attention to be shifted away from driving and onto a screen, making it more difficult for the driver to be situationally aware of their driving conditions. Dr. Ian Pike explains:

> If you are texting and driving, you are gambling. You are gambling with your own life, and you are gambling with the lives of those around you – and the odds are not good.

Many interviewees spoke of the endorphin rush and dopamine release that occurs with mobile phones. Individuals crave the chemical release and the sense of belonging in society that comes along with social media, messaging and notifications. Mark Milner spoke at length about how phones are designed to induce an impulse-habit checking behaviour, so that individuals will check their phone for a missed notification, even when there is no alert. The possible opportunity of missing a message or alert is foregone as individuals prioritize the potential immediate reward of the notification instead. Drivers prioritize this reward over the risk of an incident, as they do not fully comprehend the adverse consequences that can arise.

### 6.2.3. Changing Older Generations

Interviewees also spoke on how older drivers have formed risky behaviours prior to the distracted driving law being legislated. Generationally, there is a slow and steady awareness growing among the younger generations to avoid their phones, and this may be a result of their familiarity with hands-free devices. Interviewees argue that younger

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5 The Community Against Preventable Injuries (Preventable) is a non-profit organization with the mandate to try to reduce the incidence of serious injuries and fatalities. Preventable aims to remind individuals when and how serious injuries can occur and utilizes social media campaigns to raise awareness.
generations have learned to drive with mobile phones laws always existing and have instead grown more accustomed to using Bluetooth devices. This awareness may also be attributed to the educational campaigns that target younger generations. For older individuals, particularly drivers who have used their phones habitually for years, there is a lack of understanding towards the dangers of phone use and they are not deterred by the current measures. Interviewees have witnessed the influence younger generations have on their parents and peers in terms of avoiding the use of phones and interviewees remain optimistic that this will continue.
Chapter 7.

Policy Objectives and Evaluative Criteria

This chapter details the analytical framework that will be used to evaluate the policy options. Criteria have been identified and are used to compare options in the following chapter. They have been chosen to assess the extent to which the policies are expected to achieve multiple societal and governmental objectives as identified through the research. Each option is rated as high, medium or low against each criterion, with high representing the most desirable option and low representing the least desirable option. Options are scored as to how they are expected to perform relative to each other.

7.1. Decrease the Number of Fatal and Serious Injuries

This is the first of two criterions that measures effectiveness and looks towards decreasing the number of injuries. Options are assessed by the extent to which the policy is predicted to decrease the number of serious and fatal injuries caused by distracted driving. This assessment is done qualitatively based on the literature, case studies and interview findings. Based on the findings, each option is scored as resulting in a small, moderate or significant decrease in the number of injuries.

7.2. Decrease the Number of Distracted Driving Tickets

The second criterion used to measure effectiveness is the decrease in number of distracted driving tickets. The options are assessed by the extent to which the policy is expected to decrease the number of tickets written. Measuring effectiveness through tickets is difficult as numbers can fluctuate due to varying levels of traffic enforcement focus at different times of the year. As a result, this criterion assumes the caveat that enforcement is consistent, high and visible for all policy options year around. This criterion remains important to include however, as the study acknowledges that distracted driving does not always result in reported incidents and this aims to capture the population that is not involved in a crash. Due to constraints with the data available for the newer penalties placed in Manitoba and Saskatchewan, this criterion is measured qualitatively through case studies and interview findings. It is expected that numbers
would increase after initial implementation of any new penalty scheme, as law enforcement is likely to be more prominent and would stabilize afterwards.

7.3. Distributional Justice

The criterion of distributional justice is included as a response to a main theme that arose from the interview findings. Interviewees stated that policies need to deter individuals from participating in risky behaviour, however many drivers who are caught continue to drive with their phones. From interviews, it is acknowledged that there is a group of persistent distracted drivers, many of whom are wealthy, and this criterion aims to better target this demographic. Options are thus measured by the degree to which the policy creates equity for low- and high-income drivers. This assessment is largely based on interview findings.

7.4. Public Acceptance

Public acceptance is another important criterion to measure, particularly when the policy impacts the citizens. When a policy is accepted, it is more likely to be obeyed and can result in effective change in behaviour. What the public perceives as a fair policy in comparison to the offence is a key determinant as to whether a policy will be embraced. There is a balancing act in achieving public acceptance while also creating policy that is strict enough to enact change in behaviour, and this criterion aims to determine this. If a penalty is too restrictive in the public’s perception, they are more likely to resist and defy the law. Thus far, British Columbians have had little issue accepting the current distracted driving policies, however the proposed options are expected to create variance as some may be viewed as too strict (RoadSafetyBC 2015).

In addition, this criterion of public acceptance encompasses the aspect of policy longevity, which is defined here as how likely a policy will be updated in the future. If a policy is expected to be updated constantly, public acceptance will be weaker as the public has to become aware of a new policy, but it also creates concern amongst the public as to how effective the policy is overall. Updating policies shows how the government has been unsuccessful in deterring drivers, and these updates are their attempts at rectifying this problem. In BC, while the policies may have gotten tougher
since 2010, drivers have become craftier in hiding their illegal activities as a result (Participant 9, Interview; Saltman 2018).

This criterion thus measures the extent to which the public is expected to support and accept the policy, and this is determined through the literature, case studies and interviews.

### 7.5. Legal Complexity

This criterion of legal complexity is included as interviewees have questioned the legal feasibility of varying policies. The stricter the policy, the more likely drivers will hire lawyers to dispute it. The legal backlog of court appearances does impact police, and the justice system overall in terms of both time and money. This criterion is measured by the predicted and estimated level of pushback, and the increase in court cases. Additional cases would increase administrative paperwork and costs onto the judicial system.

### 7.6. Cost

The final criterion considers the government cost in fulfilling the policy. Costly options score low as the BC government faces budget constraints and public reaction to expensive policies. This criterion is measured by the expected cost of each policy option to implement and done so qualitatively. Costs are rated as high, medium or low based on how costly options are estimated to be relative to one another. Enforcement costs are excluded from this criterion.
<table>
<thead>
<tr>
<th>Objective</th>
<th>Criterion</th>
<th>Measure</th>
<th>Scoring</th>
</tr>
</thead>
</table>
| Effectiveness    | Decrease in serious and fatal injuries | Extent to which the policy is predicted to decrease the number of serious and fatal injuries in BC | High: Results in a significant decrease in the number of serious and fatal injuries.  
Medium: Results in a moderate decrease in the number of serious and fatal injuries.  
Low: Results in a small decrease in the number of serious and fatal injuries. |
|                  | Decrease number of tickets written    | Extent to which the policy is expected to decrease the number of distracted driving tickets written | High: Results in a significant decrease in number of distracted driving tickets written.  
Medium: Results in a moderate decrease in number of distracted driving tickets written.  
Low: Results in a small decrease in number of distracted driving tickets written. |
| Distributional Justice | High-low income wealth distribution of impacts of penalties | Degree to which the policy impacts individuals of low and high income equally | High: Results in significantly less disparity and impact between low and high-income individuals.  
Medium: Results in moderately less disparity and impact between low and high-income individuals.  
Low: Results in small change in disparity and impact between low and high-income individuals. |
| Public Acceptance | Public support | Extent to which the public is expected to support and accept the policy. | High: Public is likely to support and accept the policy.  
Medium: Public could support and accept the policy.  
Low: Public is unlikely to support and accept the policy. |
| Legal Complexity  | Administrative and legal complexity   | Estimated level of legal pushback and increase in court cases | High: Results in low or minimal legal and judicial work.  
Medium: Results in moderate legal and judicial work.  
Low: Results in significant legal and judicial work. |
<table>
<thead>
<tr>
<th>Objective</th>
<th>Criterion</th>
<th>Measure</th>
<th>Scoring</th>
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<td>Cost</td>
<td>Cost to government</td>
<td>Expected cost to government.</td>
<td>High: Low cost to government.</td>
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<td>Medium: Moderate cost to government.</td>
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<td>Low: High cost to government.</td>
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Chapter 8.

Policy Options

In this chapter, four policy options have been chosen for analysis. Distracted driving is a complex problem and requires a multipronged approach that includes enforcement, education and engineering. While the preceding proposed options do not tackle all three aspects, it is expected that an increase in visible enforcement and stronger education and awareness measures are also undertaken. Three of the options focus specifically on penalties, which remains crucial in deterring drivers. It is important to remember that driving penalties are not meant to punish drivers; they are meant to deter individuals from repeating dangerous behaviours. When distracted driving behaviours result in a dangerous incident, there are other existing penalties that punish them. The final proposed policy option looks at road design as it was a prominent piece within the interviews and the case studies. In addition, road engineering is not expected to be implemented alongside the first three policies - like enforcement and education are - and thus requires its own option.

8.1. Option 1: Status Quo

This option maintains the status quo penalty framework, which in BC entails a tiered penalty system that progressively builds on stricter penalties to disincentivize drivers. Currently, the initial ticket results in an automatic fine and premium increase of $543 and 4-demerit points; the second ticket is $888 and an additional 4-demerit points (RoadSafetyBC 2018a). More recently, distracted driving is now considered high-risk driving behaviour, and falls under ICBC’s DRP program. This means that an individual with two distracted driving tickets within three years will see an increase of $740 to their premium every year (RoadSafetyBC 2018a). Drivers with two tickets in a 5-year span trigger an automatic proposed prohibition, which drivers can either acknowledge or attempt to dispute; these prohibition periods range between 3 to 12 months (RoadSafetyBC 2018a). Since legislation in 2010, this penalty option has been updated three times and it is reasonable to assume that it will be amended again if the province does not see significant change with the scheme.
This option focuses on how BC is currently tackling distracted driving. The province been open to changing their penalties and this is shown through their history.

8.2. Option 2: Sliding-Scale Fine

This option proposes tying the financial penalty to the driver’s income, above a minimum fine. This is modeled on Finland’s speeding legislation and the option ensures that drivers will endure a financial impact, even if they are a high-income individual (Pinsker 2015). In Finland, this fine is done according to income tax records which is publicly available, however this information is not public in BC. Instead, a proxy for income could be used in the province and given that ICBC has record of vehicles through motor vehicle registrations, the corporation could play a role in determining the fine. Police would fine all drivers the minimum fine immediately on the roadside and notify ICBC of the ticket. ICBC would then be able to adjust the fine accordingly, by increasing the ticketed amount in relation to the model and vehicle type registered under the driver. Under this legislation, tickets would better represent a financial burden relevant to the individual. Unlike premium increases that are paid at the end of the year, ICBC would issue this fine immediately to the driver. This fine would have no impact to premiums as ICBC has the existing driver risk premium that would encompass higher premiums if the driver has multiple high-risk driving infractions in a two-year span.

The purpose of this option is to create equity among all drivers. Interviewees stated that high-income individuals are not as deterred by the current legislation and are willing to pay fines without changing their behaviour. As fines are ultimately meant to deter offenders, not punish them, the current legislation is failing to impact high-income drivers. This proposed policy option does not disproportionately penalize low-income drivers and also does not allow high-income drivers who are fined to be unscathed. This policy has the potential to deter wealthy, higher-risk drivers from participating in distracting behaviours.

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6 In 2016, ICBC decided to stop insuring high-end luxury vehicles as the costs of repairing luxury cars were driving up the prices for basic insurance of standard vehicles (News1130 2016). ICBC found that repairing a luxury vehicle could often cost the price of writing off a cheaper vehicle (News1130 2016). This shows precedent on how ICBC does and can treat high-income individuals differently. Prior to this legislation being implemented, luxury vehicle car owners paid at least twice the insurance rate of other drivers.
8.3. Option 3: Adding Temporary Suspension and Car Impoundment

This option proposes adding a temporary license suspension and car impoundment on top of BC’s current tier of penalties. The temporary license suspension would be immediate upon a ticket, whereas the car impoundment option would be applied on the subsequent charge. The temporary license suspension mimics Manitoba’s policy, as this new penalty was legislated in November 2018 (CBC News 2018b). Upon a first offence, a driver receives a temporary 3-day suspension and a second offense leads to a 7-day suspension (CBC News 2018b). Drivers receive a temporary license so that they can drive their vehicle home, and the suspension starts immediately thereafter. Alternatively, Saskatchewan penalizes drivers on the second offence in a 1-year period by impounding their car for 7-days (CBC News 2018c). Both additions would make a considerable change to the current tier of penalties.

The option is intended to show individuals that penalties extend beyond a monetary fine and financial impact. Interviewees found that individuals are more willing to change their behaviour if the penalty interferes with their life, such as a loss of a license. This policy has the potential to decrease distracted driving behaviours as the possibility of losing a license or losing a vehicle is sanctioned.

8.4. Option 4: Engineering Roundabouts

This final option proposes engineering roundabouts to both incident-prone intersections and within neighbourhood streets of the province. Busy intersections are omitted because drivers use their phones when they perceive the risk of doing so as low and when they perceive an unlikelihood of a hazardous situation - busy intersections are both high-risk and hazardous. Interviewees have stated the importance of road engineering, especially because the benefits of road design extend beyond reducing improper phone use. By installing roundabouts, drivers are expected to be more attentive on the road and these unconscious changes to driving behaviour are expected to decrease all types of road incidents. Sweden has experienced the benefits of well-designed road, as the country continuously sees a decrease in vehicle incidents – some of which can be attributed to the existence of roundabouts (Statista 2019; Center for Active Design 2014). More recently, the UK has followed suit (Just Landed n.d.).
Roundabouts are particularly beneficial as they indirectly eliminate high-speeds, forcing drivers to be more aware and cautious as they navigate (Center for Active Design 2014). Interviewees stated that roundabouts are a safe round design as they alter the road environment when driving, departing from the regular flow of traffic and forcing drivers to be attentive in the area.

Roundabouts are flexible and adaptable to different areas of the city, and while there may be higher costs to constructions in cities, the long-term safety features of roundabouts are viewed as beneficial in a variety of situations. For example, in the late 2000s, the city of Victoria installed a roundabout on the McTavish Interchange on Highway 17, an area that connected the city to the airport and ferry terminal (Blackburn and Pinto 2010). This project aimed to reduce congestion by constructing multiple roundabouts: one large multi-lane roundabout and a smaller single-lane roundabout. As this geographic area was congested through visitors and citizens, the roundabouts increased traffic flow and also reduced risky behaviour by implementing multiple roundabouts in a small area (Blackburn and Pinto 2010). In rural South Slocan, roundabouts have been called on by citizens to be installed on highways to prevent T-bone crashes on off-ramps scenarios (Retzlaff 2018).

This purpose of this option is to influence driver behaviour away from their phones by changing their driving environment. Sweden has found positive indirect benefits from the installation of roundabouts decades earlier, and as the impacts of roundabouts extend beyond the risky behaviour of phone use, this policy has the potential to reduce all types of vehicular incidents overall. Roundabouts are chosen ahead of speed bumps and narrower lanes as the road design measure here as it is a more drastic approach and potentially has more influence in dissuading distracted driving behaviour.
Chapter 9.

Policy Analysis

In this chapter, each policy option is analyzed against the set of defined criteria. It is emphasized that the first three options assume an increased in education and awareness campaigns, as well as improved visible enforcement.

9.1. Evolving Status Quo

9.1.1. Reduced Injuries

This option is ranked low as the status quo has seen minimal decreases in the number of serious and fatal injuries caused by distracted driving (CBC News 2015). As mentioned earlier, distracted driving-related deaths have begun to exceed those of impaired driving in BC, and this continues to occur despite penalties existing and increasing regularly (Matthews 2015). Interviewees suggest that the current fine is relatively minor, and insufficient to deter cellphone use. With this understanding, injuries will continue to remain steady.

9.1.2. Reduced Tickets

Despite the caveat of high, visible and consistent enforcement, in comparison to the other options, this option is ranked low in terms of reducing tickets. As this penalty is not as rigorous in comparison to the others, it is more likely that drivers will be undeterred from using their phones. It is expected that the number of tickets would continue to remain at approximately the 40,000-50,000 tickets issued threshold of the past few years (CCMTA 2018). Despite this tiered penalty approach, the status quo has been insufficient in changing driver behaviour. As the second ticket is an additional fine and demerit point-loss, this does not serve as a strong deterrent for drivers.

9.1.3. Distributional Justice

This option is ranked as medium, relative to the other options, and is the stereotypical one-size-fits-all model. A high-income driver is not significantly impacted
with a flat-rate fine of $543 and to many, according to interviewees, the fines are worth the cost of using their phones. Alternatively, lower-income drivers are substantially impacted by this fine as it may be unaffordable for them. Flat-rate fines disproportionately impact lower-income drivers as they have increasingly become more affected as the penalties have risen, this may even begin a cycle of debt (Pinsker 2015). Additionally, high-income drivers can afford lawyers to dispute penalties, marking an additional inequality within the existing system.

9.1.4. Public Acceptance

This option is rated as medium as the status quo penalties have been publicly accepted thus far however public support has decreased due to the penalties being updated three times in 8 years. Survey data in 2015 reveal that the public is onboard for tougher penalties, however as penalties have become tougher, police interviewees are concerned with drivers becoming sneakier in their illegal behaviours (RoadSafetyBC 2015, Participant 9 and 11, Interview). While the status quo penalties may be accepted, it has not changed the behaviour of drivers in BC despite international research suggesting that fines and demerits can change driver behaviour (CCMTA 2018).

9.1.5. Legal Complexity

As the current policy stands, this option has faced moderate amounts of legal complexity. As a lawyer, Sarah Leamon finds that her clients seek her services when they receive the notice of proposed prohibition, as they are often unaware of this driving prohibition. While the success rates of overturn offenses are unknown, it is assumed that this option has created a sufficient amount of court cases.

9.1.6. Cost

In comparison to the other options, this option is not costly to the government and thus ranks as high. This option is of no cost to the government as demerit points and monetary fines impact only the driver. When drivers receive a prohibition, the government does not pay a cost unless the prohibition is disputed.
9.2. Sliding-Scale Fine

9.2.1. Reduced Injuries

As this option impacts high-income drivers financially, it is expected that there will be a decrease in distracted driving behaviours from this demographic and thus ranks as medium. With a reduction of this risky behaviour by wealthy individuals, and the fact that the penalties will financially impact all drivers, fewer vehicular incidents and injuries will occur naturally as the policy deters an even larger portion of the public. Finland, which utilizes this sliding-scale for speeding, revealed how the number of overall traffic fatalities significantly decreased from 1995 to 2017, from approximately 450 fatalities to about 240 fatalities (Statistics Finland 2019). This reduction can be attributed to various policies, including this sliding-scale. Akin to distracted driving, speeding is a key causal factor of roadside injuries, and this study assumes that the same decrease would occur here.

9.2.2. Reduced Tickets

This option is expected to significantly reduce the number of tickets issued. In Finland, while the number of speeding tickets written have increased, risky behaviour overall has been on a decline (Yle Uutiset 2017). The country has installed more surveillance and monitoring systems and has been able to catch more high-risk drivers at a higher rate (Yle Uutiset 2017). Thus, while more drivers are receiving tickets, there are less individuals participating in this behaviour overall. As the penalties are steep, it is expected that this will deter both low- and high-income drivers.

9.2.3. Distributional Justice

This option is expected to significantly balance the inequity of impact between low- and high-income drivers relative to the other options and thus ranks high. As the monetary fine is tied to a driver’s personal income, fines will vary. Even though the monetary fine differs, the impact of the fine is equitable for all drivers, as it is proportionate to income. While high-income individuals may find this unfair, this creates equity among all drivers. For lower-income individuals, a fine of $543 may mean that they cannot afford their rent or groceries for the month, whereas that same fine for a
high-income individual is negligible. Where the lower-income individual will have to change their behaviour to survive for the month, the high-income may not notice the fine.

9.2.4. Public Acceptance

This option is rated as medium, as public acceptance and support will differ among high- and low-income drivers. It is expected that there will be lower acceptance amongst high-income drivers, and high acceptance amongst low-income drivers as compared to the status quo, wealthy drivers will now be financially impacted. In Finland, high-income individuals who are fined substantial amounts express their dissatisfaction publicly (Pinsker 2015). As this option is purely a monetary fine, it does not restrict a driver’s ability to drive and applies to both high- and low-income individuals.

Further, this option is expected to be durable. Finland and other European countries have incorporated this penalty to many other non-criminal offenses and this is expected to continue. This policy ensures that penalties will impact the wealthy and the poor equitably and despite the outcry from wealthy drivers, it is successful in creating deterrence (Pinsker 2015). It is expected that for road safety offenses, more countries will come to adopt the sliding-scale, as it emphasizes the severity of the crime without the punishment of jail.

9.2.5. Legal Complexity

This option is ranked medium as it is difficult to dispute and argue against a monetary penalty such as this, however it has been tested by wealthy individuals. As each person’s penalty is dependent on their income level and the penalties are proportionate to the offence, the impact of the fine is relative to all. Wealthy individuals have attempted to appeal these tickets, and of those that have been successful, fines have been lessened to reduce the number of lost income (Daley 2017).

9.2.6. Cost

This option is expected to be of moderate cost to the government. The government will require access to – or a proxy to – driver’s income to accurately determine the amount of the fine, and cannot reliably ascertain this through the honor
system, as Finnish history has revealed (Pinsker 2015). As ICBC keeps track of the types of cars that are registered under insurance, ICBC, instead of police, can better issue a fine that is relevant to a driver’s income based on their vehicle. This will require increased funding towards ICBC to create a database in which employees can quickly access this information, without divulging driver information.

9.3. Temporary Suspension and Car Impoundment

9.3.1. Reduced Injuries

This option is expected to moderately reduce the number of serious and fatal injuries. As the option takes reoffending drivers off the roads by impounding their cars or temporarily suspending their license, it is anticipated that less distracted driving incidents would occur. However, temporary license suspension may create a population of unlicensed drivers on the road as individuals may continue to drive without a license afterwards. While the option of car impoundment would significantly reduce injuries, the temporary suspension license aspect leaves uncertainty as to how to police unlicensed drivers, thus leading the option to be ranked as medium.

9.3.2. Reduced Tickets

In the first month after immediate roadside suspension was legislated, 241 Manitobans had their licenses suspended – in the same month a year prior, 183 tickets were issued (CBC News 2018b). In the first 11 months of 2018, Saskatchewan issued 6,011 tickets for cellphone use, however it is unclear how many of these tickets included the car impoundment penalty (CBC News 2018c). It is clear from these two statistics that distracted driving tickets has not decreased with these penalties despite enforcement becoming more consistent as the new penalties are rolled out. Despite the numbers showing an increase in tickets, it is expected that more drivers will abide by the law over time as individuals adjust to the penalties (CBC News 2018c). In comparison to the status quo, this option is thus expected to moderately reduce the number of tickets.
9.3.3. Distributional Justice

This option is not expected to create equity and justice among low- and high-income drivers and thus ranks low. For low-income individuals, impounding a car can be detrimental to their livelihood, particularly if driving is required for their job. The cost of paying the impound lot is also another impact that they may not be able to afford. A temporary license suspension would affect a low-income driver if public transportation is not readily available. If the vehicle is a family car, impounding the vehicle affects more than the individual driver. Alternatively, high-income drivers may have multiple vehicles in their possession and a car impoundment may not affect them. A temporary license suspension may be the only penalty that affects both demographics equally.

9.3.4. Public Acceptance

Public acceptance and support is ranked moderate as the policy is expected to be durable for the foreseeable future however drivers may view the penalties as significantly harsher than the status quo. As the proposed penalties are viewed as tougher than the current penalty scheme, policymakers in both Manitoba and Saskatchewan are hopeful that these will effect significant behavioural change in the long-run (CBC News 2018b, 2018c). Alternatively, as interviewees stated earlier, drivers are more concerned with losing their license than with a monetary fine, and this option proposes a license suspension and a car impoundment. Penalties for driving behaviours are meant to be a deterrent, not as punishment, and this option would be viewed as the latter as it restricts a driver’s ability to drive. Drivers may view the penalties as imbalanced to the offense which weakens both public acceptance and support of the policy.

9.3.5. Legal Complexity

It is expected that this option will be the most legally complex, as there is greater ambiguity to impounding a car and receiving an immediate roadside suspension. Interviewees suggested that this option would lead to more court cases and challenges for two key reasons. Firstly, drivers may not own the car they are driving, and it is legally complex to impound a vehicle that is not registered to the accused individual. Secondly, the option of roadside prohibition and car impoundment are immediate and
instantaneous, and interviewees are concerned about false accusations by police. Observing cellphone use is based off officer discretion, and with no review process, challenges will be raised by lawyers. According to interviews, it is likely that this ambiguity of hard evidence will result in an increase in court cases.

9.3.6. Cost

This option is ranked low as it is expected to be of high cost to the government. Impounding cars requires hiring a tow truck and paying for an impound lot. While this cost is generally paid by the individual when they pay for their car, there is the possibility that drivers cannot, or do not, come back for their cars. This eventually leaves the cost of paying the tow truck and the impound lot onto the government.

9.4. Engineering Roundabouts

9.4.1. Reduced Injuries

InterVIEWees stated that they are most concerned with drivers who use their phones at intersections as this is a common crash area. Many vehicle incidents occur at intersections due to inattention and adding roundabouts to the province would eliminate this conflict area (Hétu and Peiseel 2009). As roundabouts have only eight vehicular conflict points and a regular intersection has 32, this greatly reduces the potential for incidents (Hétu and Peiseel 2009). The US Federal Highway Administration stated that rear-ender incidents are also minimized in roundabouts as a result of the slowing speed effect (Nevada Department of Transportation n.d.). If an incident were to occur, they often do not result in serious or fatal injuries due to the slow speed in roundabouts (Bailey 2016).

While this option would reduce incidents in intersections, this does not reduce incidents on straightaways or highways. This option is thus ranked as medium as it does reduce injuries in specific intersections but has no effect on the other areas of the road overall.

7 Conflict points are areas in roundabouts and traditional intersections that are prone to crashes.
9.4.2. Reduced Tickets

This option is rated low in terms of reducing tickets, as roundabouts do not deter drivers through penalties, and thus does not change the number of tickets. While many tickets are given to drivers at red light intersections and installing roundabouts would minimize this opportunity, RCMP interviewees stated that they also utilize panhandler and bus techniques that allow them to ticket drivers while the car is in motion; police can thus continue to ticket drivers outside of these installed roundabouts.

9.4.3. Distributional Justice

This option would impact low- and high-income drivers equally, as all drivers experience driving roundabouts in the same way. As this policy does not consist of a penalty, there is no inequity among drivers. This option is thus ranked high.

9.4.4. Public Acceptance

This option is expected to receive acceptance and support and is ranked high. As seen through previous roundabout proposals, it is expected that there will be initial public pushback due to the negative perceptions towards roundabouts (Belz, Aultman-Hall, and Troy 2016). These reluctant attitudes may be less about the concept of the roundabout, and more about changing the status quo road conditions (Belz, Aultman-Hall, and Troy 2016). However, it is expected that over time the public will accept the option as the benefits include a safer and less congested intersection (Belz, Aultman-Hall, and Troy 2016). As roundabouts are not viewed as restrictive to drivers, this option is expected to be publicly accepted in comparison to the other options. Roundabouts will ultimately keep traffic flowing and reduce traffic congestion, which will benefit all drivers on the road (Hétu and Peiseel 2009).

As this policy is expected to be durable, it is expected that the legislation will have public support. Interviewees mentioned that roundabouts have become more popular in place of traditional intersections in both the UK and in Sweden, and this has created interest in other jurisdictions to install more roundabouts (Nevada Department of Transportation n.d., Bailey 2016). It is unlikely that the government would replace roundabouts with traditional traffic signals in the future and as roundabouts have a life
span of 25 years, this policy is expected to last (Nevada Department of Transportation n.d.).

9.4.5. Legal Complexity

This option is ranked as moderately complex as legal discussions may need to be held. If the province decides to build roundabouts in busy intersections, they may be met with concerns on how to acquire the amount of land needed to construct large roundabouts. This could include legal activity with existing buildings and properties. In cases of building roundabouts in smaller streets, there would be minimal legal complexity, as smaller roundabouts can be constructed with less interference to other property.

9.4.6. Cost

This option is rated as low cost as there will be expensive upfront construction costs to removing traffic signals and building roundabouts. Both roundabouts and traffic signals cost approximately $2 million to build, and in cases where roundabouts are replacing traditional signals, there is an additional cost (Bailey 2016). In Revelstoke, an intersection was reconstructed to become a roundabout and as a result of being placed within the city, there were additional costs (Jameson 2017). Costs included reconstruction of the sewage system, water infrastructure, streetlights and landscaping overall; this totaled approximately $5.85 million (Jameson 2017). In the long-term however, roundabouts ultimately reduce operational costs, with saving estimates to average $5,000 a year (Nevada Department of Transportation n.d.). Roundabouts also have a life-span of about 25 years, in comparison to the 10-20 service life years of traffic signals, thus reducing the maintenance expenditures as well (Nevada Department of Transportation n.d.).
## 9.5. Summary of Analysis

### Table 5. Summary of Policy Analysis Results

<table>
<thead>
<tr>
<th></th>
<th>Option 1: Status Quo</th>
<th>Option 2: Sliding-Scale Fine</th>
<th>Option 3: Car Impoundment and Temporary License Suspension</th>
<th>Option 4: Engineering Roundabouts</th>
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<tr>
<td>Reduced Injuries</td>
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Chapter 10.

Recommendations

Based on the analysis conducted, this study recommends implementing two options: the sliding-scale fine and engineering roundabouts. The sliding-scale fine is recommended based on how the option ranked against the others, and how it is more likely to alter the behaviour of drivers. The sliding-scale fine performs moderately or significantly well against the set of criterions, particularly when it comes to achieving better equity amongst all drivers. Of the four options analyzed, no option significantly reduces injuries or reduces ticket numbers however, the sliding-scale fine is viewed as a relatively effective option, as it will act as a strong deterrent for all drivers. The option of engineering roundabouts scored well too, however the implementation timeline is lengthy, thus making it a longer-term recommendation. The sliding-scale fine is recommended based on the speed of implementation and the ability to affect immediate change, whereas engineering roundabouts cannot be constructed immediately and as a result, will delay any change in driver behaviour.

10.1. Implementation Considerations

Distracted driving is not a simple policy issue. It is a problem that has escalated as technology advances faster than the policies aimed to regulate it. When it comes to changing individual behaviours, it is acknowledged that one disincentive may not work for all actions. Penalties serve as an important general deterrence, and with the sliding-scale fine, this policy is expected to dissuade a population that is not regularly reached: the wealthy and the high-risk. This study recognizes that some drivers will continue to text regardless of the penalties and measures in place, however, this should not discourage policymakers to remain idle. Continuously implementing new policies will effect change in some drivers, which will inevitable decrease the number of risky drivers overall.

Policymakers must be patient when monitoring change in distracted driving behaviours as penalties do not work immediately. Often a significant event is needed to occur for individuals to, first, be aware of the penalties and second, be aware of the
consequences. As the Manitoba and Saskatchewan cases demonstrate, a reduction in risky driving behaviour may take years for change to show through data (CBC News 2018b, 2018c).

10.1.1. **Education**

For penalties to work as expected, drivers need to be better educated. Improved public awareness campaigns to show drivers the potential fines with the sliding-scale approach provides a stronger message than campaigns showing the consequences of serious car crashes. Messaging that shows the potential fines across various income levels would provide a realistic reminder of the consequence of distracted driving.

10.1.2. **Enforcement**

Alongside better education, high and visible enforcement is also needed. Enforcement is crucial in deterring drivers as police officers are the first individuals a driver will come in contact with in terms of road safety and if it is not present, drivers will continue participating in risky behaviours (CCMTA 2018). As ICBC is increasing its budget for police traffic safety, this offers an opportunity to significantly increase visible enforcement (Zussman 2018). According to interviewees, individuals are unconcerned with texting openly, as there is low public perception that drivers will receive a penalty. With improved enforcement presence, interviewees believe that there will be significant changes to driver behaviour.

The added difficulty for police and the judicial system in providing evidence for cellphone use must also be considered. While the study did analyze the legal complexity for each option, it was done relative to one another. It is expected that proving phone use will be much tougher than stated in this study. Policy have technology, such as radar and breathalyzers, to catch drivers who are speeding or driving impaired, however there is no such trusted device with cellphone use. One company has created a device called the textalyzer which is expected to decipher if a cellphone was used during a certain time, however this has yet to be utilized by BC police forces (Mc Neila 2018). In all three cases of speeding, drinking and drugs, and texting, if a driver were to dispute the ticket, the onus would be on the police to present compelling evidence or witness account of the offense – this would be difficult for texting offenses. Interviewees also stated that
police often do not have the time and means to attend court appearances, and drivers who attempt to dispute tickets are generally successful.

10.1.3. **Roundabouts**

In regards to engineering roundabouts, policymakers need to be aware of the initial resistance citizens will have to a change in their driving environment (Belz, Aultman-Hall, and Troy 2016). Constructing roundabouts will require construction in frequently driven intersections and will naturally cause disruption to road traffic. The costs of removing traffic lights and expanding the intersection to accommodate a roundabout must also be considered, as well deciding on which intersections would be the most effective in reducing the incident rates related to phone use.

Drivers will also need to become more familiar with driving in roundabouts, which currently in BC is not common. The ICBC driving test should incorporate roundabout driving as a component to pass their Class 5 license. This will ensure that drivers will become comfortable while driving in roundabouts and ensures that drivers will learn how to signal properly within the area.

10.1.4. **Social Construction of Target Populations**

The final implementation consideration to acknowledge is the concept of the social construction of target populations, and in regard to the sliding scale fine, the idea of the contending population. Within the policymaking process, the role of money and the media are becoming important in understanding the creation of policy and how it affects different populations. Schneider and Ingram (1993) acknowledge that road safety policies are aimed towards automobile drivers, however there is no one social construction for this group as drivers fit in to all four target populations of the advantaged, contenders, dependents and deviants. The sliding-scale fine is better aimed towards contenders as they are high-income individuals that are perceived as drivers who use their phone continuously, despite penalties becoming increasingly tougher, and thus these individuals are viewed negatively. Despite this policy targeting

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8 According to the theory of the social construction of target populations, policies are aimed towards four different groups: the advantaged, contenders, dependents and deviants. The groups differ in terms of their level of power and social construction.
this group, the theory for contenders is that the policy will only appear to inflict burden on the group but overall have minimal effects. If this theory is true, high and visible enforcement is needed, alongside media and public attention for the policy to impact the contenders. These two factors of enforcement and media attention helps ensure that the policy does inflict impact on the contenders, rather than a policy that only appears to inflict burden.
Chapter 11.

Conclusion

The problem of texting while driving has become a global concern despite a range of approaches employed by various jurisdictions to tackle the issue, as highlighted throughout this study. Within BC, policymakers have enacted continual increases in fines and enacted other penalties to deter this trend of dangerous driving behaviour but to no avail in recent years. While this analysis proposes options intended to focus on one specific aspect of distracted driving, the study acknowledges that these recommendations are not the sole solution but rather a necessary aspect to further reduce the problem. This study thus recommends two policy options that complement each other, with one specifically targeting wealthy and high-risk drivers and the other focusing on the general public overall. The enforcement of both options is recommended as it encourages drivers to change their distracted driving behaviours with great benefit to society as a whole.

While this study focuses on penalty options and an aspect of road engineering, there are other areas for future research and data collection that were not sufficiently addressed within this project. Vehicle and cellphone manufacturers are expected to play a future role in addressing the issue of distracted driving and this was repeated by multiple interviewees. The car industry can create vehicles with technology capable of mitigating the risk of incidents that arise from distracted drivers, such as the lane control and collision technology that currently exist. Cellphone manufacturers, on the other hand, can create built-in snoozing mechanisms that automatically turn off notifications when vehicles reach a certain speed. These types of advancements follow the safe systems thinking mentioned earlier, where policymakers acknowledge and accept that individuals are human beings that will become distracted and make errors and instead aim to mitigate and minimize the risks.

This analysis gives little attention to the responsibilities of employers and businesses though there is a belief that the employers have some liability when their employees answer work calls on the road (Ian Pike, Sarah Leamon, Interview). Individuals may often feel pressure to pick up an unexpected phone call during a drive,
particularly if it is work-related or from a superior. Some individuals do not have the luxury to turn off their phones if communication is essential to their job, yet these same individuals may not have the financial means to buy hands-free technology or upgrade to onboarding systems in their vehicles. A discussion needs to take place to change how businesses function in today’s technological society and set the boundaries for work, particularly when it involves utilizing a handheld device or other distractions while operating a motor vehicle.

Another aspect that was not adequately addressed in this project was the dangers of hands-free devices. Hands-free devices such as Bluetooth have been promoted by policymakers as a means of encouraging drivers to keep their eyes on the road although these devices continue to create a cognitive distraction. As hands-free devices are permitted under BC law, drivers often assume that they are substantially safer than hand-held devices however this is not the case as both are equally distracting (Neil Arason, Interview). Better public awareness to the dangers of hands-free devices will, at the minimum, allow drivers to make the informative decision as to whether or not they feel capable of using Bluetooth devices while being safe operating a motor vehicle.

Finally, while this study addresses texting and driving through two different lenses of penalties and road design, this paper consistently emphasizes the need for a multi-pronged approach to a growing global concern. As research and interviews have shown, coordinated and strong efforts to address enforcement, engineering and education are needed for a significant change in behaviour to occur. This study analyzes and recommends two important and feasible options for the BC government to undertake, and though these recommendations have the potential to reduce distracted driving incidents in the province, a longer-term more nationwide and global-wide solution will certainly be needed to critically address this problem.
References


———. 2018a. “Be Phone Smart - Promise You’ll Not Use a Handheld Phone at the Wheel.” Be Phone Smart. 2018.


Appendix A.

Canadian Distracted Driving Penalties

<table>
<thead>
<tr>
<th>Province or Territory</th>
<th>Fine(s)</th>
<th>Demerit Points</th>
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<tbody>
<tr>
<td>British Columbia</td>
<td>$543 – first offense</td>
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<tr>
<td></td>
<td>$888 – second offense</td>
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<td>Alberta</td>
<td>$287</td>
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<td>$80-100</td>
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<tr>
<td>New Brunswick</td>
<td>$172.50</td>
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</tr>
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<td>$233.95 – first offense</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>$348.95 – second offense</td>
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<tr>
<td></td>
<td>$578.95 – subsequent offense</td>
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<tr>
<td>Prince Edward Island</td>
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<td>Nunavut</td>
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### Appendix B.

#### Scoring Matrix

<table>
<thead>
<tr>
<th></th>
<th>Option 1: Status Quo</th>
<th>Option 2: Sliding-Scale Fine</th>
<th>Option 3: Car Impoundment and Temporary License Suspension</th>
<th>Option 4: Engineering Roundabouts</th>
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<tbody>
<tr>
<td>Reduced Injuries (x2)</td>
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<tr>
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<tr>
<td>Distributional Justice</td>
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<td>Public Acceptance</td>
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<td>2</td>
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<td>Legal Complexity</td>
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<tr>
<td>Cost</td>
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