

Safe Winter Driving Practices & Preparedness Booklet Guide

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Link to Google Drive folder: [Link](#)



WHAT IS THE MAIN PROBLEM?

Calgary experiences severe winter conditions that contribute to a large number of car accidents every year. The severe winter conditions that impact road conditions are heavy snowfall, icy roads, and low temperatures that last around 4 to 7 months and an annual average of 120 centimeters of snow. (Weatherspark, n.d.; City of Calgary, 2022). In November 2024, the city received 15 centimeters of snowfall overnight and there were 282 car crashes the following day in which 24 of those accidents led to people sustaining injuries (Heintz 2024). The municipal and provincial government do have systems and protocols in place for snow removal, road maintenance, and warning systems, but the number of winter-related car accidents is a persistent issue each year (City of Calgary, n.d.).

Contributing to this issue is the lack of effective communication on safe winter driving practices. People can find resources online, but they often provide limited and vague information that does not help adequately inform the reader or make them feel better equipped to drive in dangerous conditions. Due to this lack of engaging, comprehensive, and accessible material, knowledge on safe driving practices and preparedness is incomplete for many drivers residing in Calgary. This increases the risk of unintentional reckless driving and can increase stress and anxiety for all drivers on the road. To improve the safety of everyone on the road, the best way to combat this issue is putting efforts towards educating people on how to drive safely in the winter months.

WHO IS THE AUDIENCE?

Those at higher risk of encountering a winter-related car accident or vehicle issues are those who do not have much experience driving in Calgary's harsh road conditions. This group of people may include newcomers to Calgary or new drivers. Considering Calgary's population growth of 96,000 people from 2023 to 2024, there is an inevitable increase in experienced winter drivers in the city (Ranger, 2024). For newcomers, moving to a new city or country can be overwhelming as they may experience culture shock and have to readjust their entire ways of living to thrive in a new environment. Being new to winter driving as a newcomer can feel like a very high risk. To start, there are physical, mental, and financial consequences of getting into a car accident one has to consider. Understandably, the thoughts surrounding winter driving can translate to driver anxiety that is fueled by their lack of experience and knowledge on how to navigate Calgary's winter driving environment.

Calgary residents, more specifically newcomers and new drivers, need increased guidance and communication regarding safe winter driving practices and emergency preparedness that can better inform them and inspire confidence. The educational deliverable should be accessible to the user and contain clear, concise, yet comprehensive content that provides information on vehicle preparedness, safe driving practices, emergency preparedness, and more.

DESIGN PROCESS

RESEARCH

To determine which content and medium would best suit the needs of the target group, a series of interviews will be conducted alongside a sample analysis of a variety of winter driving preparedness and driving safety sources from different organizations and municipalities.

INTERVIEWS

A total of 7 interviews were conducted which included individuals that have varying levels of driving experience and a new resident.

INTERVIEW INSIGHTS

Inexperienced Winter Drivers

Tyler Grimson, Cordelia Lee

1. They have basic driving knowledge but much less on how to adjust for winter conditions. This includes what speeds are appropriate for certain road conditions, car settings such as how to de-fog windows, other steps for preparing a car for a drive, and information surrounding winter tires.
2. Feelings of uncertainty and anxiety surrounding the risk of slipping and/or getting stuck. They want more guidance on how to handle these situations.
3. Nervous and uncertain about their own driving, but practicing and watching good drivers drive during the winter is something they think would ease their nerves.

Experienced Winter Drivers

Rory McKibbon, Erica Llamzon, Louis Tenhave, Cathy Haugen

1. Thinking of their own safe winter driving practices, they all advised to practice slow and controlled movements along with slowed down speed, keeping distance, be aware of other drivers, and to practice driving in an empty parking lot or through a winter driving course so they have more experience slipping and gaining control.
2. The drivers that were more confident in their winter driving skills had emphasized that they had to learn over the years having witnessed or been involved in winter-related car incidents themselves. They also advised that driving with a responsible driver is another way to learn.

3. To better prepare for a drive, they watch the traffic reports on TV before a drive or check websites such as Calgary Traffic or 511 Alberta to view road conditions.
4. As for emergency tools they have in their car, they had items such as an ice scraper/snowbrush, small shovel, and cardboard. They also noted they dress warm when they go driving and that their cars had winter tires and that all season tires were not sufficient for Calgary winters.

Newcomer to Calgary

Allison Flores

1. Coming from California, she has had no prior experience of driving in the snow before this winter. Her knowledge on safe winter driving includes driving at slower speeds and pressing the breaks earlier to avoid slamming on them. However, she wanted more information on how to handle an emergency situation.
2. For guidance, she mentioned that she would have looked at a winter driving book, a government website, insurance company websites, or asked people that live here for guidance.
3. To gain more confidence driving, she mentioned that she would feel more comfortable driving with an experienced winter driving and practicing over time.

USER PERSONA



BACKGROUND

Carla has been driving for 6 years in Guadalajara's city center and suburbs, but has never driven in snowy conditions. Her primary mode of transportation was the city's transit system, so it will be an adjustment to having to drive on the daily. She's feeling overwhelmed by her move and is experiencing driver's anxiety.

CHALLENGES:

- Fear of sudden weather changes
- Unfamiliarity with Calgary's road structures and road conditions
- Limited knowledge and experience on winter driving
- Lack of knowledge on vehicle maintenance
- Lack of resources

GOALS & NEEDS:

- Learn winter driving safety
- Prepare her car for winter
- Gain confidence driving in the winter
- Know how to handle an emergency
- Gain experience on safe winter driving practices

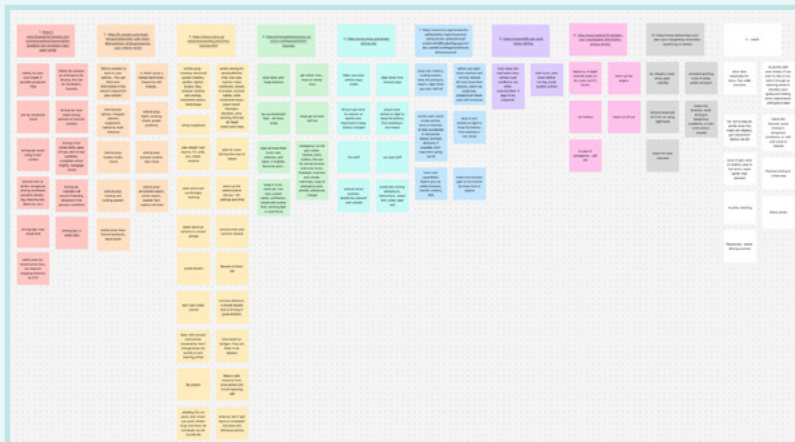
SAMPLE ANALYSIS

The goal of the sample analysis is to explore the variety of information available on winter driving guidance to better evaluate the structure and content of the information package. The sample mostly consists of non-scholarly articles from different organizations and governmental entities. The last source contains comments on the public forum Reddit. I gathered and organized the information that was presented in the articles. After this information was organized, I was able to create a basic structure of content for the information package.

SAMPLE ANALYSIS ARTICLES

1. **The deadliest risk Canadians take each winter** from the Weather Network ([link](#))
2. **Preparing your vehicle for winter** from the Government of Canada ([link](#))
3. **Driving - Winter** from the Canadian Centre for Occupational Health and Safety ([link](#))
4. **Winter Driving** from the Government of Canada ([link](#))
5. **Winter Weather Driving Tips** from the National Highway Traffic Safety Administration - USA ([link](#))
6. **Be prepared for Winter Driving** from the National Safety Council - USA ([link](#))
7. **How to prepare an emergency travel kit for winter months** from Traffic Scotland ([link](#))
8. **Driving in Winter in Lapland** from Lapland Above Ordinary (Finland) ([link](#))
9. **Driving in Norway in winter conditions** from Visit Norway ([link](#))
10. **Tips for first time driving in the snow?** from Reddit ([link](#))

Content Organization of Sample Articles



IMG1: This image displays the content presented in each article organized on Figjam.

Synthesis of Sample Content



IMG2: This image displays the synthesis of the content of each article organized into different themes and categories of content.

SAMPLE ANALYSIS RESULTS

The table below showcases the content structure of the information package for safe winter driving practices and preparedness. This is based on the synthesis of sample content.

Section	Content
Introduction	<ul style="list-style-type: none"> • Brief introduction and description of Calgary winters • Highlight importance of being prepared
Prepare Your Car	<ul style="list-style-type: none"> • Vehicle inspection • Familiarize yourself with your vehicle • Install winter tires
Emergency Kit	<ul style="list-style-type: none"> • List of emergency kit items
Before Your Drive	<ul style="list-style-type: none"> • Plan ahead (include resources for traffic updates) • Warm up your vehicle • How to de-fog windows • Clean your vehicle • Keep the gas half full
Safe Driving Practices	<ul style="list-style-type: none"> • Slow down • Increase distance between cars • Gentle steering, braking, and accelerating • Do not use cruise control • Warning box for black ice
Slipping & Getting Stuck	<ul style="list-style-type: none"> • How to handle slipping • How to handle getting stuck

PROTOTYPING & USER TESTING

Based on the insights gathered from the sample analysis and interviews, a comprehensive booklet would best suit the needs of the user group. The prototype booklet will include the informational content determined from the sample analysis and will be tested for communication principles such as clarity, retention of information, organization, etc.

FIRST PROTOTYPE

For the first prototype, I worked on Adobe Illustrator to create a booklet that had tabs at the bottom of each page. The tabs contained the name of each section for easy navigation, and on the respective pages contained the written content. For the first prototype, there were no graphics as the main focus was to determine if the content was clear and if the information architecture was adequate.

First prototype of the winter driving guide



IMG3: This image displays complete booklet alongside a page within the booklet.

IN-CLASS USER TEST PLAN

1. Introduction to project
2. Independent Review
3. Questions
 - Is the information easy to understand, even for someone unfamiliar with winter driving?
 - Are there any missing topics or unnecessary details?
 - Is there too much or too little text in any section? Do you think there could be more visual aid? Where?
 - After reading, do users feel more confident about winter driving?
 - Do they remember key takeaways, or should anything be emphasized differently?
 - Could you tell me 3 things you remember from the booklet?
4. Final thoughts and Feedback

USER TEST RESULTS & INSIGHTS

In class, I interviewed 3 students including: Grace Moore, Cordelia Lee, and Rachael Christy. The following user test and first prototype insights come from their answers to the questions and instructor feedback.

Clarity and Organization: For the interviewees, the language, terms, and length of text made the content easy to read. It is easy to skim through with section tabs and section headings. Some terms may need visual aid or be replaced with a simplified term.

Visual Design: For some sections, visual aid is needed in areas such as how to handle slipping, symbols for car buttons, and more. It is important to be selective with any decorative visuals and be intentional or strategic with important visual aids. Headings, warnings, and other important text need to be visually separated as well.

Relevance & Usefulness: Includes the basics of winter driving, but should link to additional resources for more information on the topic where users can explore further. They felt they would be more comfortable winter driving after having read the booklet. Overall tone and content should be considered to address the specific needs and circumstances of a newcomer.

Engagement & Retention: All the users were able to relay 3 things they remembered from the booklet. The things they remembered were things they had not known which displays that the information is easy to retain.

The changes for the second prototype include:

- Addition of visual aids and illustrations
- Addition of “Tips from Locals” page and “Resources” page
- Layout adjustments for print (increase top margin and addition of a second page indicator)
- Sections heading hierarchy (colour blocks)
- Spell check and editing for clarity
- Consider tone and cultural aspects that may be useful to newcomers, edit accordingly
- Include issue date

SECOND PROTOTYPE

The second prototype is a more complete version of the winter driving information booklet with changes that have been applied based on the results of the user test.

Second and final prototype of the winter driving guide



IMG4: This image displays complete booklet alongside a page within the booklet.

SECOND USER TEST PLAN

1. Introduction to project
2. Independent Review
3. Questions
 - What were your initial thoughts when you first opened the booklet?
 - Was there enough visual support (e.g., diagrams, checklists, infographics) to make the information easy to digest?
 - Were there any sections that felt too long, too short, or missing important details?
 - If you were in an emergency (e.g., car skidding, getting stuck in snow), do you feel this guide provides enough information on what to do?
 - After reading the guide, do you feel more confident about driving in winter conditions? Why or why not?
4. Final thoughts and Feedback

USER TEST RESULTS & INSIGHTS

I interviewed and user tested with 2 users for the second prototype. The following user test and second prototype insights come from their answers to the questions and instructor feedback.

Visual Design and Organization: Overall, the users thought the booklet was clean, organized, and easy to read and understand with the appropriate amount of supporting visuals. They liked that they could go between the sections with ease.

Additional information: Things that could be added or further elaborated on are the “Vehicle Inspection” section where they could be provided with additional information such as different places they could go to or a website with more information.

Availability in other languages: Another consideration for the future iterations would be having the booklet or information available in different languages. The users noted that this aspect is especially important as the target audience would be newcomers to Calgary who may like to read in another language they are more familiar with.

SOLUTION

The second and final prototype of the winter driving guidebook works to address the issues surrounding the ineffective communication of winter driving safety in Calgary. With the primary audience being newcomers to Calgary, the solution provides a welcoming, comprehensive and engaging overview of safe winter driving—covering topics ranging from vehicle preparation to emergency handling.

Inspiring confidence and reducing driver's anxiety: To inspire confidence for newcomers, I avoided using harsh language and visuals that would potentially instill more anxiety. The tone and language intentionally strayed away from an authoritative voice and more towards a voice of informed guidance. The introductory welcome message, tips from locals, and the illustrations such as the emergency checklist items and face illustrations all act to complement the content with a personal touch without taking away from the information presented.

Detailed and relevant information: Available resources online were either incomplete or vague in their guidance. This solution provides a comprehensive overview covering topics from preparing your vehicle and emergency handling to tips from locals. The content is concise and specific while providing advice with short explanations. Since it is more comprehensive, there was the risk of information overload, but to combat this risk, the bottom tabs showing the section headings and the breakdown of content on each page makes the guidebook easy to navigate and quick to go through. With the local focus, I was also able to include local resources that could be useful and relevant, such as alternative transportation options, traffic resources, and websites.

Guidance on emergency preparedness: Many drivers lack or have incomplete knowledge on how to handle emergency situations when it comes to winter driving. Sections such as the emergency kit checklist, how to handle slipping and getting stuck, and external resources and contacts cover the key areas that were a concern for inexperienced winter drivers. The instructional content of how to handle slipping and getting stuck includes the essential information in a clear and direct manner.

Accessible & engaging information: The language used is simple and the visual contrast and graphics are accessible and intentional as it has a consistent theme matching the topic. As this is a printed booklet, this would ideally be available at registries, government buildings, Immigrant Services Calgary, or be mailed along with a welcome package that people receive.

THEORETICAL FOUNDING

I have chosen 3 principles of cognition biases that relate to the effectiveness of the solution. The first is the UX design principle of chunking along with The Decision Lab's level of processing effect and the serial position effect.

Chunking relates to the structure and hierarchy of content in which information is visually separated into groups. This helps with the viewer's ability to process, organize, and retain information. Looking at the information in the guidebook, the content is separated into multiple hierarchical groups including the sections (as separated by the tabs) and the headers within each page. The headers draw a visual separation between the content and the body text within a page which creates short digestible points that are easy to find.

The level of processing effect is the idea that information is easier to remember when there is a more meaningful association between the content and the viewer, as opposed to remembering through repetition. In regard to the guidebook and the primary audience, the information that will be remembered will be that which addresses their major concerns, things they did not know, or things that may ease their anxiety. The book is a collection of guidance and tips which allows the readers to pick and choose what matters to them.

The serial position effect is about our tendency to remember the first and last things on a list while forgetting the middle items. To combat this, the booklet contains sections tabs that are always displayed on the outside which prevents people from going through the booklet chronologically and provides an opportunity for them to go through the contents in whichever order they like. This constantly changing order works to stimulate their memory and improve retention.

VALUE PROPOSITION & IMPLEMENTATION

The guidebook provides a comprehensive overview of the essentials of winter driving that can be for inexperienced and experienced drivers alike. The contents of the book provide detailed, practical, and accessible information that can be easily distributed through print or digital media, and will remain relevant for many years to come. For newcomers and/or inexperienced winter drivers, being better informed and having a resource that covers the key areas of winter driving will increase confidence and increase the number of drivers practicing safe driving. This resource can be kept by households and remain a reliable source of information indefinitely. In turn, this will lead to decreased car accidents and less strain on emergency services that experience significant strain every year during heavy snowfalls. Overall, this is a long lasting and appropriately detailed resource that will have the power to increase the amount of drivers practicing safe winter driving and making Calgary roads a safer space for everyone.

Considering this is a printed booklet for newcomers and other drivers, this would be useful if made available in registries, governmental buildings, Immigrant Services Calgary, police stations, and other institutions that face those who may need it. This could also be included in a welcome package new residents receive when they move to Calgary. For digital formats which would be more accessible, this should be on governmental websites and be available to download or print, or be integrated directly into a webpage, which also allows it to be translated into other languages. The printed booklet would be more costly in comparison to digital options, however, considering its potential longevity it may be more impactful to the recipients who could have it readily available for reading and do not have to actively search online for the resource. The digital version is less costly and best serves those who would actively seek winter driving guidance and preparation.

REFLECTION

I think the guidebook would be a very impactful and helpful solution for inexperienced winter drivers. Considering that most people's knowledge on winter driving is built through word of mouth, experience, and is largely incomplete—which is concerning and normalized—this also means there is a big opportunity to improve the communication of safe winter driving practices. Many people live in a state of acute anxiety and do not seek external resources to learn from, but if a printed booklet was delivered to them or shared with them, they would know that a resource is available if needed. Having shared this with experienced drivers that have lived in Calgary for a long time, they have all identified things that they did not know, but "should have" known. If a newcomer reads this booklet, there's a chance they would know more about winter driving than people who have lived here for most of their lives.

The booklet itself contains most essential information and more while also being easy to understand and navigate. However, for future development, it would be worth consulting winter driving experts such as driving instructors, and user testing with more newcomers to Calgary and new drivers. This would better determine if the information is accurate and helpful. Additionally, this would also need to be available online and be integrated onto a webpage not just as a downloadable PDF, but well-integrated so that the sections are just as easy to explore as the printed version. This would allow for the source to be translated into other languages, which is especially relevant for international immigrants. This information should also be available on governmental websites and other institutional websites that newcomers would visit, or be easily accessible to anyone who looks for it.

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