



**Crafting a Winnipeg Winter Planning Strategy
With Lessons from Other Cities**

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Abstract

Despite their unique conditions, many cold-weather cities are not built to maximize winter liveability. While some cities aim to solve this issue with a dedicated winter city planning strategy, Winnipeg, Canada has yet to develop such a plan. This report seeks to aid the City of Winnipeg in developing a winter city planning strategy by looking to exemplary winter cities for guidance. First, Winnipeg's existing planning documents were reviewed and analysed for content relevant to winter planning. Second, a precedent study of Edmonton, Saskatoon, and Buffalo was conducted to distill lessons for Winnipeg. Third, a conventional approach to knowledge synthesis was used to combine the findings from the first two methods and inform the process of creating a Winnipeg-centric winter city planning strategy. Each research method revealed key insights about the subject matter. Despite some encouraging policies, Winnipeg's existing planning documents generally do not fully consider the winter context. The most direct way to address this need is a dedicated winter city planning strategy. Edmonton has an award-winning strategy in place, which has inspired other cities, including Saskatoon and Buffalo, to create strategies of their own. Together, these strategies revealed the need to build on the existing strengths of a city, the importance of collaborating with public and private stakeholders early, and the value of public engagement throughout the strategy development process. The research culminates in eight steps Winnipeg could follow to create a winter city planning strategy of its own, informed by the precedent cities and tailored to the Winnipeg planning context. This report is most useful for the City of Winnipeg, but other municipalities may also find value in the findings.

[Keywords: Winter cities, planning, urban form, climate, policy analysis, precedent study]

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1.0 Introduction

1.1 Report Background and Scope

Winnipeg, MB is a mid-sized city located in central Canada with a population of 749,607 (Statistics Canada, 2021). Geographically, Winnipeg is a prairie city built on a flood plain on some of North America's flattest lands (Parks Canada, n.d.). The city earns its reputation as having among the coldest winters in the world, with average lows of -22°C in January (Byrne, 2016). In 2017, Economic Development Winnipeg (EDW) and Mayor Brian Bowman announced the city had received membership in the World Winter Cities Association for Mayors (WWCAM), in an effort to celebrate winter as part of Winnipeg's identity (Spiring, 2017). The WWCAM is a non-governmental organization with a stated goal to "share information and technologies useful for comfortable winter living and address issues facing the world that we all must collaborate together to deal with" (World Winter Cities Association for Mayors, n.d.). To mark the event, EDW shared video of the press conference on its YouTube channel, titling it "Winnipeg is now officially a 'winter city'" (Economic Development Winnipeg, 2017). This however raises the question: *What was Winnipeg before if not a winter city?*

The mental imagery associated with winter is relative to one's own experiences. In Southern California, winter is sweater weather and a retreat from scathing hot summers. In parts of Canada, winter may feel like the default season. Academic definitions of "winter city" remain largely unchanged since the 1980s. Pressman (1987) referred to previous definitions drawing on average monthly temperatures or specific latitudes as arbitrary, citing multiple cities that should logically earn the title but do not meet the criteria (p. 2). In response to this problem, he attempted to create a more inclusive definition: "A 'winter city' is one in which the average maximum daytime temperature is 32°F (0°C) for a period of at least two months or longer" (p. 4). This definition has mostly endured the test of time. Since Mayor Bowman's announcement, one paper proposed distinguishing *winter cities* from *Winter Cities*, with the former indicating a cold-climate city and the latter a commitment to climate policy (Stout et al., 2018, p. 3). Perhaps this is what the City meant by making the moniker "official." If so, five years on, one would expect to see progress in this area. This report, in part, seeks to explore the extent to which Winnipeg's commitment to becoming a Winter City is true by reviewing planning policy documents for

evidence of seasonal thinking. The initial hypothesis is Winnipeg does not go far enough to address winter liveability based on the lack of a winter city strategy.

While the central focus of this report is the City of Winnipeg, winter city strategy precedents from the cities of Edmonton, AB, Saskatoon, SK, and Buffalo, NY also feature. A winter city strategy is a policy or set of policies which seeks to improve winter living conditions for a given jurisdiction. Selecting three cities for review allows for an in-depth look at the process of strategy development, contents, and results. At the end of the report, the lessons learned from the precedent cities are applied to the Winnipeg context, generating eight steps that Winnipeg could take towards developing a winter city strategy.

1.2 Primary Research Questions

This research seeks to answer the following questions:

1. To what extent do Winnipeg's policies currently address planning for winter liveability?
2. What can Winnipeg learn from how other cities have approached winter liveability in their planning policies?

1.3 Winnipeg's Winter Reputation

Calling Winnipeg cold is an understatement, and the climate has bestowed a rather negative reputation upon the city. Playing hockey, a winter sport invented in Canada, at the highest level in Winnipeg should be desirable. However, in the National Hockey League, the Winnipeg Jets routinely sit at the top of players' no-trade lists regardless of the team's on-ice success (Custance, 2017). At times, players from other teams such as the San Jose Sharks have openly criticized the city as "cold and dark," naming Winnipeg as the worst city to visit for road games (Bernhardt, 2018). Perhaps Winnipeg has an image problem stemming from its winters.

Internationally, the city has made headlines for being cold. For one day in 2013, Winnipeg was colder than Mars. In an homage, NASA named an area of Mars after Winnipeg a few years later (CBC News, 2015). Perhaps no one is as harsh on the city as the residents. Local band The Weakerthans (2003) wrote the song *One Great City!*, a sarcastic ode invoking imagery of grey winter skies, stalled vehicles, and featuring a refrain of "I hate Winnipeg." The song struck a chord with locals and their complicated relationship with their home. Of course, not

every Winnipegger feels negatively about their home. For instance, a popular Instagram campaign invites Manitobans to submit selfies of their “frosty faces” to encourage people to get outside and enjoy the winter season (Thompson, 2022). Winter weather evokes a spectrum of opinions in locals ranging from negative to positive.

Surely, there must be more to a place than the weather. Is it fair to judge a city based on something which cannot be controlled? Arguably, no. How a city responds to that weather, however, is fair game. Given the reputation Winnipeg appears to carry to this day, some five years after officially declaring itself a winter city, there is clearly room for improvement. The goal of this report is to explore the possibilities for improvements which make winter more liveable and a greater point of pride for locals.

1.4 Limitations and Biases

From the initial proposal, this project was designed to revolve around digital and online research to reflect the uncertainty associated with COVID-19 restrictions. Ultimately this turned out to be a wise decision, and the assumption that work may be interrupted by fluctuating restrictions was proven correct. Further, the 2021-22 academic year saw additional disruptions due to a legal strike by the University of Manitoba Faculty Association. This event limited access to internal advisors as well as the research ethics approval board for an extended period in the fall semester. The nature of this project, by focusing on analysing existing policy documents and studying precedents, rather than working with human subjects, meant progress was largely unaffected by the pandemic and the strike. However, this means the final product looks very different than it may have if the approach was not framed and developed under these circumstances.

If this project had occurred during a “normal” year, the approach to the project would have been changed to include field research. A practical limitation of the COVID-19 pandemic was a reduction of services and events. Bringing people together outdoors is a product and measuring stick of effective winter city planning. This is simply at odds with social distancing practices, which discourage large gatherings. Living in downtown Winnipeg at the time of this project would have provided the opportunity to conduct non-participatory observation at winter destinations like the Forks. Unfortunately, pandemic irregularities and concerns about the usefulness of such data inhibited the inclusion of this research method. Simply put, life during a

public health crisis does not reflect typical use patterns of public spaces, and the inclusion of such data would have added questionable value to the quality of the findings.

The only bias I wish to declare is my appreciation for this city I have called home all my life. The year before I began this report, I went through a major shift in my lifestyle. No longer residing in the suburbs, I went car-free. Living through two winters in the densest part of Winnipeg completely changed my perspective on the season. Much of what I disliked about the winter turned out to be car- and suburb-related. I started dressing for the wait at the bus stop, not the walk to the car, and found the outdoors much more comfortable. I began to enjoy the beauty of snowfall without worrying about tomorrow's road conditions. Best of all, I could carry out my daily routines on foot year-round in the most walkable part of Winnipeg. My bias? I want all Winnipeggers and guests to the city to experience my new outlook on winter.

This report demonstrates change is possible for Winnipeg. If my research moves the needle even the smallest bit in the right direction, I will be satisfied with my work.

1.5 Report Overview

The contents of this report are organized into six chapters. This introduction is first, followed second by the literature review, which examines and synthesizes the body of knowledge as it relates to winter city planning theory and practice. Third is the research methods chapter. This section describes the research methods selected to answer the research questions and explains how they were employed. Fourth is the findings chapter, which presents the knowledge gathered from reviewing Winnipeg's policies and the precedent strategies. Fifth is the analysis and applications chapter. This section synthesizes the findings from all four cities to create a framework of steps Winnipeg can follow to develop a winter city strategy. Finally, the conclusion summarizes major findings, makes recommendations, and identifies areas for future research.

2.0 Literature Review

“Living *with* winter not in spite of it should be the planners’ motto.”

– Norman Pressman (1996, p. 525)

Although much has been written about city planning in general, only a relatively small subset of scholarly research has been conducted in the context of planning liveable winter cities. This report focuses on learning from the planning policies of winter cities. To my knowledge, there is a lack of research focused on planning policies for winter cities. Instead, policy implications and recommendations for planners are embedded in the findings and conclusions of individual papers spanning a variety of subtopics within the literature. This context has necessitated a wider scope when reviewing the existing literature to identify information relevant to contemporary winter city planning practices. Identifying which theories have informed modern planning policies in winter cities is also an important component of policy evaluation. This literature review provides an overview of winter city planning research to date, with an interest in the theoretical approaches followed by the authors.

This chapter is organized into four sections. The first discusses the state of the literature. This overview provides insight into where the field stands today, providing context for the structural organization of this review. The second examines foundational research in winter city planning theory published through the latter half of the twentieth century. These texts established principles upon which the field of study still stands. The third focuses on contemporary research directions in twenty-first century literature. These texts represent the work being done to advance the field. The fourth discusses the literature as a whole and draws conclusions informed by the research findings.

2.1 Overview: The State of the Literature

Several contemporary authors researching winter city planning agree that the literature has long since had its heyday, with some adopting a more critical tone than others. Stout et al. (2018) claim academic literature on the topic of winter cities is lacking, calling the publications of Norman Pressman through the 1980s and 1990s “a substantial proportion of the total” current body of knowledge (p. 9). Chapman et al. (2019) cite this period as the peak of winter city design

research (p. 2). Larsson and Chapman (2020) expand on this claim, suggesting the decline in the volume of research has “left practitioners following classical urban design principles for winter cities,” emanating from the earlier work of Pressman (p. 632). These claims echo the experience of researching the topic for this review. Pressman’s writing dominates the search results, and his influence is well represented among the work of his contemporaries and successors. Of all the literature coded for this chapter not written by Pressman, 72% includes at least one citation crediting his work.

Another common criticism in the literature is the focus on summer climates as the default research context, regardless of the subtopic being studied. McDonald-Yale and Birchall (2021) suggest the urban environment has been studied at depth for its influences on health, behaviour, and safety, however this focus has not been extended to the unique setting of winter cities (p. 638). On outdoor comfort in winter, Yilmaz et al. (2020) characterized the research as limited, claiming existing research focuses only on factors affecting summer comfort in parks (pp. 3673-3674). As the scope narrows and topics become more niche, there are even fewer sources to draw from. Concerning with the use of environmental assessments to design winter cities at the block scale, Watanabe et al. (2016) states there is a lack of research accounting for the effects of snow and wind in urban design (p. 456). These issues serve as a reminder of why winter city planning emerged as a focus in the first place. Interviewed in 1994, Canadian architect Beaton Sheppard criticized Canada’s cities as not accounting for climate, saying:

Even though Canada is the third coldest country in the world, our designs do not reflect this condition. We fall way behind Sweden, Norway, and Japan in this regard. Much of our building technology and materials used in construction come from the South. (Quoted in Dawes, 1994, p. 28)

This is arguably a function of the lack of widespread awareness about winter design principles. The issue appears to have persisted over the last quarter century, leaving the field of study in precarious state. There are, however, positive signs for the future.

Speaking on winter cities as a movement—the phenomenon of winter cities incorporating these principles into policy—Stout et al. (2018) concedes interest was renewed around 2010 “as both a policy field and, to a lesser extent, an object of academic inquiry” (p. 2). This assertion is consistent with the findings in this review. Researchers concerned with winter cities should take advantage of this momentum. There is a clear desire from academics to advance this field, but

the conditions must be conducive for this to occur. Davies (2015) suggests that the downfall of the Liveable Winter Cities Association—a network of planners and researchers co-founded by Pressman and his peers—was the result of insecure funding and a reliance on volunteers (p. 279). This presents a funding opportunity for winter cities and governments at all levels to invest in the advancement of this research, creating a mutually beneficial relationship that should drive both the volume of research and the creation of evidence-based policy. With this context in mind, the focus now shifts to the contents of the literature.

2.2 Foundational Research in Winter City Planning

Pressman has already been established as a founding father of the field. His bibliography is vast and spans several decades, so only a selection of his work representing his larger ideas is presented and discussed here. Many of these ideas are foundational to the domain of winter city planning and recur throughout his publications. For instance, Pressman’s definition of a “winter city” has persisted throughout the literature largely unchallenged. Writing to address his dissatisfaction with prior definitions, Pressman (1987) defines a winter city as “one in which the average maximum daytime temperature is 32°F (0°C) for a period of at least two months or longer” (p. 4). This definition was cited unchanged as recently as Paukaeva et al. (2021), while other authors who have used it offered additional clarity. For example, Chapman et al. (2019) references snow as the dominant (but not only) form of precipitation and added that daylight hours are limited, a rather distinct quality of winter cities (p. 2). Stout et al. (2018) differentiates between a *winter city* and a *Winter City*, defining the first as a geographical quality and the second a reflection of political will (p. 3). With renewed interest in winter city initiatives at the municipal level, perhaps the time has come to formally update the longstanding definition to include these changes.

Pressman’s staying power in the literature could be a function of two factors. The first is the previously discussed lull in the research after his publications slowed in the late 1990s, rendering him both the starting point and the authority on the subject. The second may be rooted in his common-sense approach to the issue, which does not leave much room for rebuttal. According to Pressman (1987), the issues plaguing winter cities are a result of planners ignoring winter and concentrating on summer design, which he attributes to a lack of education in “seasonal thinking” (p. 8). The basic solutions for winter settlements were to provide shelter

from northerly winds while maximizing solar exposure, a tested solution he found common across major northern settlements (p. 22). Working as a generalist, Pressman identified issues and proposed solutions that took advantage of winter conditions across several areas. He and his collaborators considered the economy, the mobility of pedestrians and vehicles, housing and suburban structure, the social and public realm, visuals, energy efficiency, and microclimates (Pressman & Zepic, 1986). These areas of inquiry are represented in the contemporary literature. Central to Pressman's holistic approach is the recognition of the relationship between the physical environment, culture, bio-physiology, and the economy, which he argues must all be considered as part of solutions to create effective change (Pressman, 1996, p. 527). Davies (2015) reinforces these four domains as fundamental to understanding the issues (p. 280), while Chapman et al. (2019) simplify them to the physical, social, cultural, and economic conditions for designers and planners in winter climates (p. 2). These four domains are reflected in the approaches of precedent cities discussed later in this report.

A function of Pressman's wide approach and the sheer volume of research is some ideas appear to be ahead of their time, while others have since fallen out of fashion. For instance, two of his principles to preserve energy in climatic responsive environments are to encourage higher density urban form and infill development (Pressman & Zepic, 1986, pp. 112-113). This may be a function of the cyclical nature of planning and culture in general—settlements prior to the automobile were, after all, human scale and compact. In recent years however, compact development and infill has emerged as a solution to many urban issues. Throughout his book *Walkable City*, planner Jeff Speck (2012) points to compact design as the solution to everything from curbing carbon emissions to obesity. This highlights the need to revisit older research for modern applications.

Not every solution proposed by Pressman has endured, however. Pressman (1996) encourages the creation of above and below grade pedestrian corridors (p. 524). Today these corridors are less popular. Davies (2015) makes a connection between Toronto's underground walkway and the car-centric design above, a problem he attributes to outdated planning concepts focused on avoiding winter (p. 4). The above-grade walkways of Minneapolis and St. Paul have also been a source of controversy, with some outside the literature claiming they exacerbate issues of racism and classism in addition to reducing the street life below (Mars 2021). These

criticisms are proof that while monumentally influential, Pressman is not infallible. With a strong foundation in place, the logical progression for a new generation of researchers is to test and build on these ideas by determining best practice.

2.3 Contemporary Research in Winter City Planning

Current research picks up where others left off. Stout et al. (2018) continues their criticism of the field as it stands today, seeing the literature collectively as “poorly connected, with a lack of clear, agreed-upon understandings of key concepts” (p. 9). This trend has partially been observed during the process of organizing this review. While most of the authors will make connections back to Pressman, the researchers often appear isolated from one another and dedicated to answering specific research questions in specific contexts. In other words, a shift from generalist research to best practice appears to have occurred. The latter half of Stout et al.’s statement is inconsistent with these findings, as most articles appear derivative of and congruent with earlier work in the field. Many of the texts available for this review were published after 2010, which remains consistent with the timeline outlined earlier in this chapter. Research directions in contemporary literature are scattered into several narrow areas of study, and a selection to represent this is presented for discussion.

One of the ways the research landscape has evolved is a shift in where new publications are emerging from. International collaboration has been a longstanding tradition in the field, evidenced by the creation of the Liveable Winter Cities Association and Pressman’s Nordic precedents. However, publications were originating mostly in North America and simply drawing on international precedents. Recalling Beaton Sheppard’s words about Canada falling behind Japan in climate responsive design, it would seem to be an issue of perspective, as at least one Japanese scholar’s work calls this claim into question. Setoguchi (2004) echoes Sheppard’s sentiments about Canadian urban design, saying that “in Japan, there are various regions from Hokkaido to Okinawa, but urban design approaches in each region are similar to each other” (p. 335). This suggests complaints about winter cities are universal. China, a nation undergoing rapid urbanization, is producing similar criticisms seen in North America and Japan:

Urban design principles in many Chinese cities are similar to each other without considering regional climate variation. Especially in winter cities, without climate responsive urban design principles, most public open spaces are turned into useless

places in winter, which is not only because of the low temperature, but is also due to strong wind influenced by the design of surrounding buildings. (Meng & Setoguchi, 2020, p. 335)

This statement could have been written about any number of winter cities in any number of countries. Despite all that has been written about winter city planning, urban planners the world over have failed to incorporate these principles into their work. Research into best practice is focused on design interventions for fixing existing built environments.

Setoguchi (2004) has emerged as a prominent researcher of winter urban form. Following Pressman's lead, he furthered the research on infill practices with a focus on snow management. Using computer simulations to test different design models, he found infill placed on previously vacant lots could reduce snowdrifts on streets, decrease blowing snow, and weaken turbulent wind (p. 340). Collaborating with Watanabe et al. (2016), he studied urban design at the block scale, discouraging unified building heights in winter cities and recommending environmental assessments play an integral role in the design process (p. 461-462). Most recently, he contributed to research on temporary design interventions in established public spaces. Two studies on the same public square in Russia revealed practical lessons in design. The first used social media and artificial intelligence to gain insights into pedestrian impressions of temporary designs. The authors found when time-limited events were held, people paid attention to both temporary elements and the permanent ones, suggesting public spaces should be flexible and designed for all seasons to improve perceptions of winter (Paukaeva et al., 2020, p. 15). The follow-up article tracked pedestrian movement through the square during events and during non-events, with convincing results:

Overall, event design intervention had a critical impact on people's place-related activity and their length of routes, especially at night. Engagement in activity increased by 44% in the daytime and by 62% at night, whereas the average length and complexity of the route taken by each individual increased by 18 to 34 m. (Paukaeva, 2021, p. 8)

The willingness to participate in outdoor winter programming is encouraging and should be capitalized on to maximize enjoyment of winter. These studies also reinforce Pressman's call for a holistic approach to design that incorporates winter design principles from the start of every planning project, so spaces can adapt to the weather with the people.

Elsewhere in the world, researchers have focused on mobility in varying contexts. Garvin et al. (2012) examine aging-in-place, finding common complaints among seniors

regarding snowy sidewalks impeding movement in their neighbourhood and restricting access to public transportation (p. 383). Leng et al. (2020) reiterate the need for seniors to move about their neighbourhoods for exercise. They identified sidewalk hazards as a barrier to physical activity for seniors, suggesting snow removal be prioritized where sidewalks connect to greenspaces (p. 16). Yang et al. (2020) compares attitudes toward active transit among Nordic and non-Nordic residents, finding Nordics more willing to brave winter weather in all forms than non-Nordics (p. 11). Chapman and Larsson (2021) explore barriers to winter cycling, finding engagement to be a matter of perception and recommending planners focus on designing all-season cycling networks so summer and winter cycling are not treated as two distinct activities (pp. 7-8). These studies show the need to build environments suitable to their users' needs and abilities. They also underscore a willingness to engage with the winter environment, so long as the urban form allows. Many of these studies are linked in theme, findings, and intent, but as Stout et al. claims they do not connect to one another overtly. The research field would benefit from further collaboration across disciplines and countries, in contrast to Pressman's (1996) opinion that every country must make their own solutions (p. 527). There is much to be learned from synthesizing international successes and failures. Two cities sharing a country do not necessarily share the same problems, especially in the Canadian context. Vancouver for example, would likely find more common ground with Seattle than Regina. Future research should continue to embrace worldwide knowledge sharing.

2.4 Summary

Winter city planning literature is broad, but shallow. Much of the foundational research informing contemporary planning methods is built on the work of one man. While his work was rooted in a common-sense problem-solving approach, such as sheltering from wind and maximizing sunlight, some cracks are showing in the more specific interventions like skywalks. Strategies specific to winter cities remain a moderate gap in the overall planning literature. As a subtopic, winter city planning literature does not have gaps so much as it has dead ends: In theory, snow should be removed from transportation networks. In practice, what modes are prioritized, and where is snow stored once cleared? One assumption during the research phase of this review was that interest in winter city planning would increase due to climate change. Only two authors, Larsson and Chapman (2020) and Yang et al. (2020), mention climate change at all.

This is one area where the lack of research is glaring. The foundations are there, and researchers must continue expanding on them. After experiencing a period of decline, the field of study has received renewed interest in recent years and reached a point where determining best practice is the goal.

No matter where they are in the world, winter cities seem to suffer from the same root issue of planners and other city builders ignoring local context in favour of warm weather approaches. This creates three-season cities, with the task of retrofitting winter cities into Winter Cities. At the core of this task is policy and design considering the physical, social, cultural, and economic conditions of a location. A holistic approach encompassing all four of these areas is required to maximize success. For instance, having great indoor facilities will not matter if residents cannot navigate snowy sidewalks to reach them. Achieving these goals requires buy-in from multiple levels of government and partnerships, and a shift in mindset which allows winter to be enjoyed rather than tolerated or ignored. The concepts explored in this chapter are key to forming actionable winter city planning policy emphasizing liveability.

3.0 Research Methods

A series of qualitative research methods were used in answering the research questions. These methods are reviewed in this chapter in the order they appear in the report.

3.1 Literature Review

A literature review summarizes what is known and unknown about a topic by evaluating the associated body of literature for strengths and weaknesses (Taylor, 2008, p. 1). The process involves critically examining literature, synthesizing the findings, developing unbiased assessments of the authors and their work, and determining areas for additional research (Taylor, 2008, p. 1) This literature review served a dual purpose of providing background information for the reader and informing the policy review and precedent study. My process followed four steps in sequence: Gathering literature, manually coding, interpreting findings, and reporting results.

Prior to gathering literature, a list of key terms including “winter cities,” “policy,” “design,” “climate,” and “urban planning” was developed. Boolean search techniques were then employed to broaden the search and mitigate the chance of literature being overlooked. For instance, one such search string was “winter city” AND “policy” OR “practice” AND “urban planning” OR “city planning”. Exhaustive searches using this technique were carried out on databases from the University of Manitoba Library, Google Scholar, JSTOR, and ProQuest. PDFs of winter city planning literature were saved and reviewed for relevancy. Relevancy was determined by selecting peer-reviewed sources containing historical information, policy recommendations, examples of best practice or new findings, and theories of winter city planning.

Coding was completed manually in Microsoft Excel. Coding is a content-analysis tool concerned with recording the “frequency with which words or concepts occur in texts or across texts” in order to “provide insight into the similarities and differences in the content of the texts” (Carley, 1993, p. 81). Initially, 38 pieces of literature were collected for consideration. After review, 22 were coded and 20 were included in the final report. Passages thought to be important were pulled from the literature and categorized in Excel. The spreadsheet included a box for recording citation information, a main code, a sub-code, my comments, and links to other

literature. In total, 117 passages were imported to Excel to support the interpretation phase of the literature review.

Findings were interpreted by using codes to identify emerging themes, commonalities, and differences. Inferences about the wider body of research were drawn through inductive reasoning, a common practice in social science when using small sample sizes (Krippendorff, 2004, p. 36). This process resulted in a narrative around winter city policy literature including historical theories, key researchers, and modern trends. In the reporting step, the narrative was written to form the literature review in Chapter 2.0. Findings from the literature review were considered during analysis in Chapter 5.0.

3.2 Policy Review and SWOT Analysis

This report is concerned with planning and policy documents. To review and analyze Winnipeg's policy documents, they first had to be selected. I began with *OurWinnipeg 2045*, as this is the current development plan for Winnipeg and represents the present priorities of policymakers in Winnipeg. Review of *OurWinnipeg 2045* led to *Complete Communities 2.0*, the secondary plan to aid implementation of the development plan. *Complete Communities 2.0* elaborated on the top-level ideas in *OurWinnipeg 2045* and included a list of guiding documents which both inform and aid in implementing the plan. Each of the guiding documents listed in *Complete Communities 2.0* were examined for relevancy to winter city planning principles and included or excluded in the review on this basis.

A complete list of the 16 policies selected for review is found in Chapter 4.0 under subheading 4.1. In a process akin to the literature review, relevant passages were imported to Excel and coded. Each policy document was read at least twice. The first reading was to find explicit incidences of seasonal thinking in the document. These are surface level mentions which demonstrate considerations for winter, such as direct references to snow management or climate. Subsequent readings occurred after reviewing the precedent cities in concert with the findings from the literature review. The focus of these readings was to identify implicit strategies which may support a winter city vision, regardless of stated intent. Findings from this research step were interpreted using SWOT analysis.

SWOT analysis was selected to interpret the findings from this explorative process. SWOT analysis is a planning tool which identifies and categorizes strengths, weaknesses, opportunities, and threats as they relate to a given plan. The origin of SWOT analysis is contested. Believed to be developed for the corporate world, the use of SWOT analysis as an analytical framework has become mainstream and is used in several industries (Helms & Nixon, 2010, p. 216). Strengths and weakness are intended to be internal qualities of the organization, while opportunities and threats are external variables of the environment an organization is operating within (Gurel & Tat, 2017, p. 996). The simplicity of SWOT analysis is both a strength and weakness of the tool. In response to this, Helms and Nixon's (2010) research suggests SWOT analysis be used as a starting point in strategy planning, rather than the final product (p. 234). This advice has been heeded for this report. The approach has been modified to place less emphasis on the internal and external labels. Findings from the SWOT analysis are combined with results from the precedent study and used to create an actionable policy framework.

3.3 Precedent Study

Initially, case studies were the desired research method. Case studies involve in-depth research into one specific area of inquiry. They require large amounts of data and time to complete, and suffer from difficulties in generalizing findings (Gray, 2004, pp. 124-125). For the feasibility of this report, precedent studies were used instead. While similar to case studies, precedent studies are smaller in scope and are commonplace in the study of architectural theory and design (Jauslin, 2019, p. 50). Precedent studies involve the collection and synthesis of relevant information from comparable projects to “provide inspiration and help with the justification of an idea” (IGI Global, n.d.). For this report, the identified precedents are all existing winter city strategies.

Emerging from the literature review was the prevailing idea that while cities can learn from each other, those ideas must be adapted to the local context. Logically, the more similar the cities are, the easier the adaptation process will be. Following Pressman's suggestion that countries must develop their own solutions, an internet search to find Canadian municipalities with winter city strategies was undertaken. Edmonton emerged as an early candidate, since it received a lot of online press for their *Winter City Strategy* document.

Ultimately, only a handful of Canadian cities were found to have such strategies, including Regina and Saskatoon. As the closest major Canadian cities to Winnipeg, and being prairie cities themselves, both appeared to be appropriate for this study. A closer look revealed Regina did not have much available online in the way of documentation beyond one brief overview document. In contrast, not only did Saskatoon have the policy documents necessary for review, but they modeled their approach after Edmonton's strategy. This was an unexpected advantage. While Edmonton is a larger city than Winnipeg, and therefore can be expected to have more resources, Saskatoon is much smaller than both. If the strategy works in cities large and small, the strategy should work in Winnipeg.

Buffalo was selected to be the third precedent city. Like Canada, few American cities have their own dedicated winter strategies. While looking to European or Nordic countries was an option, Buffalo was chosen instead. As a mid-sized North American city, its urban form was comparable to Winnipeg in terms of car-centric design. With the precedents selected, the next step was to distill the contents of their strategies for comparison with each other to determine the best course of action for Winnipeg to undertake.

3.4 Knowledge Synthesis

There are many ways to synthesize knowledge on a subject. For this report, a conventional approach was used. This approach was adapted from an analytical review of research synthesis methods in the fields of health and social science conducted by Schick-Makaroff et al. (2016). The authors define research synthesis as the “approaches to combining, aggregating, integrating, and synthesizing primary research findings” (p. 174). Conventional synthesis is a traditional approach which is less structured than other methods and is not reliant on quantitative data. This approach was selected because the authors highlighted policy documents as a common data input and conceptual frameworks as one possible output, making it well suited to this report (p. 176). As a less-systematic method compared to other approaches to knowledge synthesis, there are no rigid guidelines to follow besides summarizing, synthesizing, and integrating findings in pursuit of a research question (p. 178). These three broad steps were employed in generating a framework toward a Winnipeg winter city strategy.

Summarizing the knowledge gained from the precedent study was the first step of this process. This was completed for each of Edmonton, Saskatoon, and Buffalo and may be found in Chapter 4.0 under subsections 4.2, 4.3, and 4.4 respectively. The second step was to synthesize the information by comparing the strategies to one another, organized into steps taken at the pre-planning, planning, and post-planning phases of strategy development. This synthesis revealed commonalities, instances of best practice, and pitfalls to avoid. This information is found in subsection 5.2 of Chapter 5.0. The third and final step was integration. Everything featured in the report up to this point is combined in this stage: The literature review, findings from Winnipeg's policy documents, and the lessons from the precedent cities. Proposed are eight steps for Winnipeg to follow to generate their own winter city strategy, found in subsection 5.3.

4.0 Findings from Policy Document Exploration

This chapter reports the findings used to answer the research questions. Policy documents from Winnipeg are explored first in the context of research question one: *To what extent do Winnipeg’s policies currently address planning for winter liveability?* Winter city strategies from Edmonton, Saskatoon, and Buffalo are explored subsequently in the context of research question two: *What can Winnipeg learn from how other cities have approached winter liveability in their planning policies?* The findings are analysed and applied in the following chapter.

4.1 Winnipeg, Manitoba

There is a clear hierarchy to the plans which inform Winnipeg’s development and growth. A top-down approach was used to review these documents, beginning with the *OurWinnipeg 2045* development plan, then the *Complete Communities 2.0* directions strategy, and finally the series of guiding documents which support the implementation of the higher-level policies.

4.1.1 OurWinnipeg 2045

OurWinnipeg 2045 is the City’s new long-term development plan. Passed into law by council in 2021, the plan is representative of the direction development in Winnipeg is expected to take over the next ~25 years. Key information about the contents of this policy document as they relate to this inquiry is summarized in Table 1 using direct quotes.

| Page | Passage | Code |
|------|--|-------------------|
| 2 | Corporate Vision: To be a vibrant and healthy city which places its highest priority in quality of life for all its citizens. | Vision statement |
| 2 | Corporate Mission: Working together to achieve affordable, responsive, and innovative public service. | Mission statement |
| 8 | OurWinnipeg is meant to be referenced at all stages and levels of City decision-making to ensure there is alignment with the framework used to identify and respond to community needs. | Context |
| 8 | LG: Leadership and Good Governance; ER: Environmental Resilience; EP: Economic Prosperity; HW: Good Health and Well-being; SE: Social Equity; CB: City Building | Thematic goals |
| 14 | Living in a Sustainable City: Many of the themes articulated in OurWinnipeg 2045 are not new. Greater sustainability, which is at the heart of this new plan, has been a long-standing goal of the City over many years. | Context |

Table 1: Excerpts from *OurWinnipeg 2045*. Source: *City of Winnipeg (2021a)*.

Sustainable development appears to frame all aspects of this document. The document is organized into goals, objectives, and strategies and uses baseline data to measure success. The phrase “winter city” is completely absent from the text, with no references to winter, snow, cold, or ice whatsoever. The plan is succinct at 50 pages, but the principles of the document are expanded upon in *Complete Communities 2.0*.

4.1.2 Complete Communities 2.0

Complete Communities 2.0 is a secondary plan that conforms to *OurWinnipeg 2045*. The documents were prepared, proposed, and passed by council in tandem. *Complete Communities 2.0* offers more specific planning directions in support of *OurWinnipeg 2045*. Both documents share the same corporate vision, mission statements, and organizational structure. Key information about the contents of this policy document as they relate to this inquiry is summarized in Table 2 using direct quotes.

| Page | Passage | Code |
|------|---|--------------------|
| 6 | The Complete Communities Direction Strategy 2.0 is a citywide secondary plan that guides growth, development, and land use in the city of Winnipeg. The primary focus of Complete Communities 2.0 is to describe Winnipeg’s physical characteristics and introduce an Urban Structure that creates a framework for the city’s future physical growth and development. | Context |
| 8 | The detailed policy contained in this Complete Communities 2.0 builds on the policy direction provided in OurWinnipeg, using the Urban Structure and related planning concepts to guide physical growth in a manner that supports sustainable development goals. | Context |
| 9 | 3. Complete Communities supports a pedestrian, cycling, and transit friendly environment by integrating public infrastructure, land uses, and built form to encourage higher residential densities and building-type variation, where practical and feasible. | Guiding principles |
| 10 | Is Cold Weather a Barrier to Complete Communities? The short answer is no. Whether it’s rain (Portland, Ore. and Vancouver, B.C.), extreme heat (Miami, Fla. and Phoenix, Ariz.) or snow (Montreal, Que. and Ottawa, Ont.) – cities can adapt to their unique climates. Winnipeg’s cold weather climate creates a host of benefits. However, it also poses challenges that we must overcome to best handle the demands of the weather and to fully utilize the winter season as an important community asset. By applying planning and design approaches suited to our unique climate, Winnipeg can mitigate some of the discomfort and inconveniences of winter. | Context |

Table 2 continues on the following page.

| Page | Passage | Code |
|------|---|--------|
| 45 | Priority snow clearing 6.10 Continue to provide enhanced snow clearing service on streets, sidewalks, bike lanes, the Riverwalk and strategic park spaces Downtown to maintain year-round mobility and access. | Policy |
| 45 | Riverwalk system 7.5 Ensure that the river system continues to be incorporated into the pedestrian network within, to, and from Downtown year-round, including river access points to the formal Riverwalk system as well as access points to winter river trails. | Policy |
| 138 | 2.2 Ensure the high-quality design of park sites, recreation facilities and their amenities that [...] c. Encourage year-round activity while accommodating and celebrating Winnipeg as a winter city. | Policy |
| 140 | Climate sensitive design 4.2 Ensure the design of recreation facilities, parks, and open spaces utilizes climate-sensitive design principles, does not harm archeological and historic resources, and supports other features that further the goals of OurWinnipeg and the Climate Action Plan. | Policy |
| 152 | Winter city design 1.4 Support exemplary winter city design through site planning and building techniques that encourage year-round use of streets and civic spaces, facilitate walking and cycling, maximize sun exposure, minimize wind, and facilitate snow storage and removal. | Policy |

Table 2: Excerpts from Complete Communities 2.0. Source: City of Winnipeg (2021b).

Table 2 reflects all references to winter in the document. *Complete Communities 2.0* offers the first direct references to the challenges of planning in the local climate, as well as evidence of climate-influenced policy. As a directional document, the policies are phrased at conceptually high-level and do not specify implementation strategies. This is intentional, as the document states: “A number of existing/Council endorsed guiding documents have been completed to guide the implementation of *OurWinnipeg* and the *Complete Communities 2.0*” (City of Winnipeg, 2021b, p. 11). These documents are detailed next.

4.1.3 Guiding Documents

The guiding documents are the third component of Winnipeg’s development plan structure. They represent more specific policy and are said within *Complete Communities 2.0* to aid in implementation of the overall vision for Winnipeg’s future. Guiding documents fall into two categories: Existing and proposed. This report is only concerned with the former, as policy which does not exist cannot be reviewed. However, one should note neither category contains a winter city strategy, and only the proposed “Recreation Strategy” would appear relevant to this inquiry.

Further, among the list of existing guiding documents are “secondary plans” which refer in broad to neighbourhood specific plans. These have not been considered for review as the scope is small, they only exist for a select few neighbourhoods, and they do not represent a citywide approach to planning. This leaves the following guiding documents for consideration:

- **City of Winnipeg 2015 Accessibility Design Standard (Third Edition)**
- City of Winnipeg 2020 Infrastructure Plan
- City of Winnipeg 2018 State of the Infrastructure Report
- **Downtown Parking Strategy**
- **Ecologically Significant Natural Lands Strategy and Policy**
- Financial Management Plan
- Garbage and Recycling Master Plan
- **Go... to the Waterfront**
- Public Art Policy
- **Transit-Oriented Development Handbook**
- **Winnipeg’s Climate Action Plan**
- **Winnipeg Pedestrian and Cycling Strategies**
- Winnipeg Public Library Strategic Plan 2015-2020
- **Winnipeg Transportation Master Plan**

Upon the review and coding of these documents, only those listed in bold were determined to contain relevant information. Key information about the contents of each of these documents has been summarized in the following tables using direct quotes, beginning with Table 3 and the *City of Winnipeg 2015 Accessibility Design Standard (Third Edition)*.

| Page | Passage | Code |
|------|---|---------------|
| 34 | Covered routes are preferred in exterior locations, or alternatively the incorporation of snow-melting systems. Snow accumulation at routes should be removed completely after each snow fall. | Best practice |
| 37 | Provide designated areas for snow piling from all major exterior routes and away from accessible parking stalls or paths of travel. | Requirement |
| 83 | Low-level lighting shall be high enough to clear normal snow accumulation. | Requirement |
| 84 | The efficient and thorough removal of snow and ice are also essential to outdoor pathways. Negotiating a wheelchair or stroller through a snow covered path is exceptionally difficult. Icy surfaces are hazardous to all pedestrians, especially individuals such as senior citizens who may not be sure-footed. | Context |
| 89 | Snow accumulation at curb ramps shall be minimized throughout the winter months. Windrows can distort traffic sounds used for wayfinding by persons with vision loss | Best practice |

Table 3: Excerpts from the City of Winnipeg 2015 Accessibility Design Standard (Third Edition). Source: City of Winnipeg (2018a).

The *Winnipeg Accessibility Design Standard* document follows the principles of universal design to create consistent standards for an accessible urban form. The language used in Table 3 to describe best practice for covered routes is repeated for ramps and stairs, stressing the importance of snow and ice clearing to prevent any pedestrian movement from being impeded. The document is well organized with a logical layout that describes the rationale, application, and design requirement for each decision. Next, the *Downtown Parking Strategy* is represented in Table 4.

| Page | Passage | Code |
|------|--|-----------|
| 14 | 3.1 Encourage the redevelopment of surface lots for residential, commercial or employment uses | Objective |
| 16 | 4. 1 Support a “park-once” philosophy Evaluate “Park Once/Pedestrian First” concept for Downtown. In addition to promoting the skywalk system, this could include a review of programs such as the Downtown Spirit circulator bus program, which at present, does not operate during typical commuting times. | Objective |
| 18 | 4.3 Walking and cycling improvements | Objective |

Table 4: Excerpts from the Downtown Parking Strategy. Source: City of Winnipeg (n.d.a).

The *Downtown Parking Strategy* includes objectives which directly align with the higher order development goals as outlined in *Complete Communities 2.0*. This includes promoting the infill development of surface parking lots as well as strategies to encourage more people to walk, cycle, or take the bus. Absent from this document is any reference to snow clearing strategies, a

curious omission as street parking is an important factor to consider when determining high priority snow clearing routes. Next, the *Ecologically Significant Natural Lands Strategy and Policy* document is represented in Table 5.

| Page | Passage | Code |
|------|--|---------|
| 7 | Climate is one of the major influences affecting the natural communities in Winnipeg and the surrounding area. Winnipeg has a continental climate with cold winters and hot summers. The temperatures in winter average -10.5°C while the average for summer is 15°C. Extreme high temperatures of 40°C and lows of -45°C are possible. Precipitation averages 514 mm. The effect of this climate means that plants and animals must be adapted to high and low temperature extremes, and must be able to survive in adverse conditions. | Context |

Table 5: Excerpts from the *Ecologically Significant Natural Lands Strategy and Policy*. Source: *City of Winnipeg* (2007).

The passage in Table 5 represents the only acknowledgement of climate adaptations in the *Ecologically Significant Natural Lands Strategy and Policy* document. There is no other evidence of seasonal thinking. Images are used throughout but only one depicts a winter scene, giving the document summery aesthetics and a tone that otherwise focuses on non-winter seasons. Next, *Go... to the Waterfront* is represented in Table 6.

| Page | Passage | Code |
|------|---|------------------|
| 15 | The vision is to build upon our strength in ‘four season events programming’ to maintain a vibrant downtown year-round. | Vision statement |
| 17 | The vision is to emphasize that Winnipeg is a city for all seasons. Each season Winnipeggers will be compelled to engage the elements to enjoy breathtaking scenery, fun activities and seasonal programs, like the international ‘Warming Huts’ competition capturing the imagination of designers from around the world. Each neighbourhood will have a place that, by stair or by ramp, you will be able to get down to the water or ice | Vision statement |
| 25 | New winter and summer active transportation crossings will open up to transform our downtown neighbourhoods into walkable communities with active transportation access to our downtown universities, University of Winnipeg and St. Boniface College, as well as future rapid transit connections to the University of Manitoba. | Vision statement |

Table 6: Excerpts from *Go...to the Waterfront*. Source: *City of Winnipeg* (2018c).

Go... to the Waterfront frames Winnipeg as a “river city”. The document is a collection of visions for the future of recreation in Winnipeg, with a focus on increasing access to the rivers and riverfront land year-round. Maps are used to highlight existing areas with traits that conform to the strategy and to identify specific areas for future intervention. Four-season design is

encouraged throughout, and references are made to creating relationships with stakeholders of all sorts as critical to the fruition of these visions. However, the document does not include an implementation strategy to achieve the declared goals. Further, there are no specific timelines for the proposed interventions beyond the 20-year timeframe of the overall document. Next, the *Transit Oriented Development Handbook* is represented in Table 7.

| Page | Passage | Code |
|------|--|-----------|
| 11 | Is Cold Weather a Barrier to TOD? The short answer is no - TOD always needs to adapt to climate. Examples abound in many climates: in the rain (Portland and Vancouver BC); in the heat (Miami and Phoenix); or in the snow (Chicago and Ottawa). The design of TOD requires land uses to be in close proximity to each other increasing the feasibility of using transit. In Calgary, a recent study found that the walking distances to transit increase in the winter, likely due to people wanting to avoid the messy and potentially dangerous roads caused by snow and ice. | Context |
| 20 | The transitway has been one of the key components of making public transit an important part of everyday life in Ottawa. Enclosed walkways and heated shelters meant that to transfer between buses in February no longer risked being a bitter, uncomfortable ordeal. Ottawa's transitway benefited from provincial funding; without the 75 percent contribution to capital cost from Ontario it never would have been built. | Precedent |

Table 7: Excerpts from the Transit Oriented Development Handbook. Source: PB's PlaceMaking Group (2011).

The *Transit Oriented Development Handbook* is a reference guide seemingly written for developers. The guide provides an overview explaining the concept of such developments, guiding principles, and implementation strategies. All information is backed by a series of precedents and case studies from other cities. The document contains language identical to *Complete Communities 2.0* on the subject of cold weather being a barrier, affirming the relationship between the two documents. Obstacles specific to winter are identified at times but are not the underlying focus of this guide. Next, *Winnipeg's Climate Action Plan* is represented in Table 8.

| Page | Passage | Code |
|------|--|------------------|
| iv | Winnipeg is recognized as a leading Winter City in greenhouse gas emissions reductions and climate action. | Vision statement |
| vi | Strategic Opportunity #4 Facilitate Compact, Complete Development and Increase Density | Objective |
| 3 | A warming climate will also mean more moderate winter weather. Winter, spring, and fall seasons are also expected to get more precipitation while summers are projected to have less precipitation. Year-to-year variability is likely to increase. | Context |
| 16 | Winnipeg’s Climate Action Plan aims to reflect the unique qualities and challenges of the city. It aims to leverage the fact that Winnipeggers live and work in a winter city. While this does create some challenges – for example, increasing the cost of heating relative to warmer climates - it also validates the need for residents to use energy more wisely than those living in warmer climates. | Context |
| 24 | Investments in active transportation infrastructure and enhanced maintenance over winter months ensure people-powered transportation is more convenient, accessible and increases road safety. | Objectives |
| 41 | The City of Winnipeg has a significant opportunity to pursue land use strategies that align with climate mitigation through the implementation of compact, complete communities, transit-oriented development, increased infill and higher density neighbourhoods. | Context |
| 54 | 7.2 Increase and preserve tree canopy | Objective |
| 55 | Winnipeg’s Climate Action Plan provides a framework for the City’s ongoing efforts to reduce greenhouse gas emissions in a holistic way. This framework includes a vision for the future, as well as emissions reduction targets that are ambitious and set the course for Winnipeg to be a leading winter city in climate action | Context |

Table 8: Excerpts from Winnipeg’s Climate Action Plan. Source: City of Winnipeg (2018b).

Winnipeg’s Climate Action Plan is a thorough document intended to promote strategies which takes steps to mitigate the effects of climate change while adapting to the changes already being experienced. The ideology is consistent with parent documents, suggesting the need for sustainable growth through compact development, infill, and robust transit to address climate change. These ideas are also logically consistent with principles relevant to winter city design, as demonstrated in the literature review. Further, the document addresses the local context of Winnipeg’s climate and accounts for how this impacts energy use and the overall approach to addressing climate change in Winnipeg. Next, the *Winnipeg Pedestrian and Cycling Strategies* document is represented in Table 9.

| Page | Passage | Code |
|---------|--|------------------|
| vii | Winnipeg is recognized as a leading Winter City in promoting walking and cycling throughout the year. | Vision statement |
| vii | Walking and cycling infrastructure will be maintained in good repair, operational in all seasons, including establishment of priority networks for winter maintenance. | Vision statement |
| 44 | There is a significant strategic opportunity to encourage more Winnipeggers to walk and cycle throughout the year. The telephone survey conducted for the Pedestrian and Cycling Strategies helped to understand the overall market for cycling. The telephone survey found that many Winnipeggers already walk and cycle throughout the year, including in the winter months, and that a large number of Winnipeggers want to walk or cycle more. The survey also helped to understand some of the barriers to walking and cycling, and actions the City could take to encourage them to walk or cycle even more. | Context |
| 49 | For walking, many Winnipeggers pointed out the lack of sidewalks or sidewalks in poor condition, poor snow clearing, as well as safety and security concerns as key current barriers to walking. The top priority identified among workshop and survey participants was more snow removal to allow for clear sidewalks in the winter. | Context |
| 120 | Weather Protection: Ensuring that awnings and/or street trees provide a canopy over the sidewalk area can protect pedestrians from sun, rain, snow, and wind. In addition, it helps to frame the pedestrian environment and establish a pedestrian scale. | Best practice |
| 128 | This change follows the requirement that all transit stops must be connected with sidewalks but is more specific in requiring access between the frontage road and the transit stop. This requirement recognizes the difficulty in accessing transit stops on frontage roads, particularly in the winter and especially for seniors or pedestrians with physical impairments. | Context |
| 188 | In Winnipeg and other winter cities, the provision of change rooms, shower, and/or storage facilities for cyclists and their gear can support cycling year-round. | Context |
| 224-225 | Providing lighting and illumination throughout sidewalk, pathway, crosswalk and bicycle route design is an important consideration, allowing safe and comfortable use of the network both day and night. This is especially important during the winter months as both the morning and evening commutes take place in the dark. | Best practice |
| 230 | To enable walking and cycling in all seasons, winter cities such as Winnipeg need to maintain sidewalks and bikeways year-round, including snow removal in the winter | Objective |
| 245 | Designate and prioritize a Winter Cycling Network for snow removal. | Objective |

Table 9: Excerpts from Winnipeg Pedestrian and Cycling Strategies. Source: Urban Systems (2014).

The *Winnipeg Pedestrian and Cycling Strategies* document is perhaps the most extensive, cohesive, and coherent guiding document informing policy. Urban Systems, the firm which authored the document, identifies problems, proposes solutions, and includes timelines for their implementation and indicators for monitoring. The recommendations are informed by a mixture of planning theory, statistics, and public engagement. Table 9 provides only a selection of the evidence that winter city thinking has been integrated into policy. Winter is referenced repeatedly through the document by way of explaining how barriers are mitigated or eliminated. This document was found to be a good example of how winter cities should view their issues and prepare their policy documents. Finally, the *Winnipeg Transportation Master Plan* is represented in Table 10.

| Page | Passage | Code |
|------|--|------------------|
| 47 | Transit: Good coverage [...] direct service [...] frequent service [...] fast service [...] reliable service [...] comfortable ride [...] | Vision statement |
| 76 | Expand the existing transportation asset management program to respond to current and anticipated infrastructure maintenance requirements: Enabling Strategies [...] e) Review and refine the current policy for street cleaning, snow removal and ice control, and ongoing maintenance as it relates to the multi-modal transportation network. | Objective |
| 90 | Goal: A Well-Maintained Transportation System Indicator: Service standards for snow clearing. | Objective |

Table 10: Excerpts from the *Winnipeg Transportation Master Plan*. Source: *City of Winnipeg (2011b)*.

The *Winnipeg Transportation Master Plan* is focused on enhancing the multimodal transportation network to meet the needs of a growing population. Planning for winter liveability is addressed by recognizing the need to improve current snow and ice management policies. The document also identifies the need to provide true rapid transit, and lists indicators that measure success of the stated objectives. Although references to winter are brief, they appear in contextually appropriate sections regarding the built environment and pedestrian comfort. This document is slated to be updated.

4.2 Edmonton, Alberta

Edmonton is not new to creatively embracing a winter city mindset. Dawe (1994) highlights the creation of “Winternet”, an early online database of information collected from 20 winter cities (p. 29). With a history of innovative approaches to managing winter issues, Edmonton is once again ahead of the curve among Canadian cities. The City published the first strategy document

in support of their current “WinterCity Edmonton” campaign in 2012. An implementation plan followed the next year, and a design guideline for the physical environment was completed in 2016. More recently in 2018, the City published a report evaluating their strategy. These documents are reviewed in chronological order.

4.2.1 For the Love of Winter: Strategy for Transforming Edmonton into a World-Leading Winter City

Edmonton’s master strategy document states their motivating goal in the title: To become a world-leader among winter cities. The first section of the document is dedicated to background information and context, followed by a detailed account of the vision and goals of the strategy, highlights of things Edmonton already does well, and a summary of the development process.

Developing the Strategy. Edmonton began the process in June 2010 with a city councillors’ meeting to create a group in support of the initiative (City of Edmonton, 2012, p. 61). This resulted in a research trip to Norway and Finland the following winter, and the identification of early elements which would define the direction of the strategy. The next move was to develop a think tank of volunteers hailing from the realms of urban design, hospitality, public life, and marketing (City of Edmonton, 2012, p. 62). Think tank members worked together in small groups under those banners for six months, using expert knowledge to draft thematic goals which would inform the direction of this strategy. Public consultation launched in January 2012 with a symposium event, followed by six months of engagement with community members and stakeholders amounting to over 20 sessions (City of Edmonton, 2012, pp. 63-64). In May 2012, a draft of the document was produced for review by everyone who attended the previous events. Ultimately, over 40 people of various backgrounds and associations helped develop their strategy.

Goals and Actions. The midsection of the document is dedicated to the 10 WinterCity Strategy Goals. The goals are presented in no particular order, and organized under four themes: *Winter life, winter design, winter economy, and winter story*. Each goal is introduced with a rationale explaining the inspiration, typically amounting to a combination of public feedback, best practice, or existing initiatives in Edmonton. Every goal is backed with specific actions to support implementation. The actions are varied and include policy proposals and amendments, accessibility improvements, infrastructure upgrades, and calls for collaboration with other

municipalities in Alberta and around the world. Every action includes a recommended project lead for implementation, and many actions include a list of potential partners. For most goals, their section ends with a list of precedents from other cities. While some of the goals could apply to any cold climate city, the associated actions are mindful of the unique context of Edmonton. They reference other policy documents, existing laws, and take advantage of opportunities specific to the City. This creates a distinctive strategy tailored to the wants and needs of the city's residents.

Key Ideas and Takeaways. Throughout the document, emphasis is placed on changing the culture of Edmonton. To achieve buy-in from residents, the think tank was careful to ensure their feedback was the driving force behind the changes (City of Edmonton, 2012, p. 4). A culture change is also evidenced by their approach to implementing the strategy. Actions 10.1 and 10.2 call for the creation of a WinterCity Advisory Council and WinterCity Coordinator position respectively, but insist they are temporary and only intended to see through the implementation process, at which point the “winter lens” is expected to become engrained in the culture (City of Edmonton, 2012, pp. 46-47). This notion is supported by a holistic approach targeting the social, cultural, and economic realms of Edmonton simultaneously, and the commitment to four-season design intended to improve overall liveability year-round (City of Edmonton, 2012, pp. 5-6). Collaboration is evident from the development process through implementation, and the mixture of consultation, expert knowledge, and precedents is balanced effectively with a clear relationship between problem identification and mitigation efforts.

4.2.2 For the Love of Winter: WinterCity Strategy Implementation Plan

The implementation plan results from action 10.3 from the master strategy. This supporting document provides a further breakdown of each action to guide its completion.

Action Breakdowns. For every action, there are desired outcome(s), the identification of lead sponsor(s) and suggested partner(s), a timeframe, priority status, progress measures, requested financial resources, and a cost estimate (City of Edmonton, 2013, p. 8). The desired outcomes and progress measures are clearly linked back to the specific actions and establish what success looks like with a quantifiable metric. Timeframes are divided into ongoing, short-term (1-2 years), mid-term (3-5 years), and long-term (6-10+ years), congruent with the original timeframe suggested in the master strategy. Of the 64 actions, 27 are designated as foundational

priority status, 28 are quick wins, and the remaining 9 are classified as “determined actions” (City of Edmonton, 2013, pp. 50-51). Foundational actions are defined as essential to achieving a cultural shift, while quick wins require less time and effort to complete (City of Edmonton, 2013, p. 5). There is no explanation for what “determined actions” entail.

Probable Cost. Every action has an associated cost. These are estimated based on the need for additional funding beyond the existing municipal budget, as the plan states most actions can be achieved without added costs (City of Edmonton, 2013, p. 4). Appendix B provides further details on funding, including year-by-year costs for each action over 10 years as well as the source of funding. The total cost in new funding is estimated to fall between \$2.68 and \$3 million, or approximately \$284,000/year for 10 years (City of Edmonton, 2013, p. 49). The rationale characterises these costs as relatively inexpensive, citing that both economic and social returns on investment should be taken into consideration (City of Edmonton, 2013, pp. 4-5).

Key Ideas and Takeaways. This supporting document demonstrates how the plan largely works within existing budgets, assigns concrete timeframes, and lists quantifiable measures of progress. The desired outcomes provide clarity on success, and the affirmation of lead sponsors allocates responsibility to specified actors. The implementation plan is grounded and highlights the feasibility of the overall *WinterCity Strategy*.

4.2.3 Winter Design Guidelines: Transforming Edmonton into a Great Winter City

The design guidelines document results from action 3.5 from the master strategy. The guide opens with a forward from Pressman endorsing the guidelines as “a welcome and needed addition to the existing knowledge” (City of Edmonton, 2016, p. 1). He goes on to signify the guidelines as important not only for achieving Edmonton’s goals, but for all cold-weather communities. Information is presented throughout the guide with informative text, illustrations, and photographs. The document is divided into four major sections: Introduction, winter design guidelines, implementation, and appendix.

Introduction. The introduction establishes the planning context for Edmonton, highlighting facts about its winter season and making connections to other policy documents written by the City. Information is provided on the creation and application of the guidelines, including the intended audience. One should note that the guidelines are not just for the

downtown but extend to Edmonton as whole. This is important as much of the literature around winter city planning focuses on urban public spaces and dense downtown neighbourhoods. This section also provides an overview of design elements. Protection from wind, maximized sun exposure, use of colour, artificial lighting, and winterized infrastructure are declared the five core principles behind their winter design approach (City of Edmonton, 2016, p. 6). Finally, the introduction calls for a collaborative approach to implementation and monitoring, and commits to ensuring all future development applications adhere to the five winter design principles (City of Edmonton, 2016, p. 16).

Winter Design Guidelines. The guidelines are divided into two parts: The streetscape and open spaces, each guided by a stated goal. The goals are then supported by specific outcomes which are informed by areas of intervention. Design interventions for the streetscape fall under either the “built form & public realm” interface or “streetscape elements & linkages.” The former covers areas such as neighbourhood-level planning, roof design, and the pedway system, while the latter is concerned with matters like sidewalks, bus stops, and parking.

The open spaces section is split into site design and winter infrastructure. Site design includes site planning, pathways, and recreation, while winter infrastructure encompasses concerns such as shelters, signage, and lighting. Altogether, the design guidelines provide advice and best practice for essentially every aspect of the built environment.

Throughout this section connections are made to higher-level planning documents, with specific call-backs to the *WinterCity Strategy* prominently featured. Planning terms like “wayfinding” are explained in pop-out boxes, recognizing the wider audience for the guide (City of Edmonton, 2016, p. 53). Planning theory and precedents feature heavily throughout, creating a user friendly and visually appealing document.

Next Steps: Implementation. The implementation strategy sets two expectations for the future. First is the partial adaption of these guidelines into other policy documents and standards over time (City of Edmonton, 2016, p. 82). Second is the need for Edmonton to create performance measures for winter design, citing a lack of such measures among other winter cities to draw upon (City of Edmonton, 2016, p. 82). A series of 17 “next steps” are outlined, each with an estimated timeframe and a lead sponsor identified.

Appendix. Along with acknowledgements and references, the appendix explores existing and potential connections to a series of other documents by the City of Edmonton. Existing links are made to *The Way Ahead*, Edmonton’s then-current master plan, and the five supporting documents collectively called *The Ways* (City of Edmonton, 2016, p. 89). For each document, a paragraph describes the reciprocal relationship between the design guidelines and *The Ways* strategies. Potential connections are identified through a non-exhaustive list of supporting policies which “should be reviewed for guidance on new development goals and design” related to the winter design guidelines (City of Edmonton, 2016, p. 90). Every document represents an opportunity to further embed winter design principles into Edmonton’s policy fabric.

Key Ideas and Takeaways. The design guidelines display a serious dedication to changing the culture of the city via modifying the built form. The information is presented in a logical progression that appears cohesive when read in conjunction with the *WinterCity Strategy* and *Implementation Plan*. The guidelines will be critical for not just Edmonton, but any winter city which aims to incorporate winter design principles into their policies.

4.2.4 Keep the Snowball Rolling: WinterCity Strategy Evaluation & Report

Edmonton’s *WinterCity Strategy* is still operating within the original timeframe. This evaluation and report took place four years into the implementation process, and eight years after the initiative first began. The reflective document provides an update on the reception of the strategy, evaluative measures of success, and key lessons learned to date.

Praise for the Strategy. Throughout the report, feedback is presented through quotes offering praise for the strategy. The quotes represent a diverse group of stakeholders including Edmonton residents, politicians, and businesses owners. The quotes are backed by formal praise: The *WinterCity Strategy* has received several awards, including the “award for planning excellence” from the Canadian Institute of Planners (City of Edmonton, 2018, p. 5). Further, the team behind the plan has presented their work at conferences around the world at events in the United States, Turkey, Japan, and Mongolia (City of Edmonton, 2018, p. 4).

Measures of Success. Quantitative and qualitative data were collected to review the original 10 goals, grouped again under the themes of *winter life*, *winter design*, *winter economy*, and *winter story*. A combination of online surveys, interviews, analytics, attendance numbers,

and participation statistics were used in the evaluation process (City of Edmonton, 2018 p. 14). There is a heavy reliance on results from one opinion survey, which received 1,869 responses (City of Edmonton, 2018 p. 18). When referenced, these results are supported with additional data. For instance, on the question of attending more festivals and events over the past five years, 36% agreed, 35% disagreed, and 28% were indifferent (City of Edmonton, 2018, p. 30). That data was paired with another graph showing a stable rise in event attendance over the same five-year period, lending validity to the survey results. Results from goal evaluation determined positive changes occurred in all areas targeted by the strategy.

Key Ideas and Takeaways. The overall message from this report is to sustain the early momentum on the project and to keep pushing ahead. While the tone is positive, challenges are noted, specifically with the implementation process (City of Edmonton, 2018, p. 7). Not every action has come to fruition on time, some have been tweaked, and others have been completely reimagined (City of Edmonton, 2018, p. 11). In these cases, the messaging is to be flexible and open to changing approaches. Nonetheless, the language used for future recommendations emphasizes staying the course, using key words like “continue” and “maintain” to highlight successes (City of Edmonton, 2018, p. 12). Various measures point to Edmonton’s strategy as being off to a very successful start, with many parties interested in learning from them.

4.3 Saskatoon, Saskatchewan

Saskatoon’s winter strategy is dubbed *WintercityYXE: Saskatoon’s Winter Strategy* and was published in September 2020. Their approach borrows heavily from Edmonton, with adaptations made for the local context. The master strategy document is described first, followed by the supporting documents: *Implementation Plan*, *Comprehensive Engagement Report* and the *Background Report*. The documents are reviewed in chronological order.

4.3.1 *WintercityYXE: Saskatoon’s Winter Strategy*

The vision statement within *Saskatoon’s Winter Strategy* imagines Saskatoon as “a vibrant, prosperous and dynamic community that thrives during winter months and works together to support an active winter lifestyle that is inclusive and accessible for all” (City of Saskatoon, 2020, p. 17). The document is effectively two parts: Background information on strategy development, and the list of objectives, outcomes, and actions.

Developing the Strategy. Saskatoon’s development process consisted of three distinct tactics. First was to catalogue existing strengths. This provided the opportunity to “promote what already exists, seek synergies through cooperative efforts and identify gaps to be filled by the strategy” (City of Saskatoon, 2020, p. 12). Second was to fund “quick wins”, mainly grants and outdoor events, to generate interest and support for the initiative (City of Saskatoon, 2020, p. 14). Third was community engagement, which was ongoing throughout the development process and included the creation of the WintercityYXE working group, a scaled down version of Edmonton’s think tank (City of Saskatoon, 2020, p. 12). The process took approximately five years, and the strategy incorporates the information learned from the three development tactics.

Objectives, Outcomes, and Actions. The remainder of the document is devoted to the intervention strategy. The strategy is organized into objectives, outcomes, and actions under three themes: *Winter economy, winter life and culture, and winter design* (City of Saskatoon, 2020, p. 20). There are seven objectives, 11 outcomes, and 25 actions. The actions are “generalized to provide for flexibility, while understanding there are many ways to approach each action” (City of Saskatoon, 2020, p. 20). For some objectives, connections are drawn to existing programs and policies through the designated actions or in pop-out boxes.

Key Ideas and Takeaways. Saskatoon’s strategy is built around community feedback by community stakeholders for community members. Strategic partnerships are promoted throughout the document. Though relatively short with only 20 pages of text, the document provides sufficient information on what has been done in the past, what is being done presently, and what must be done in the future.

4.3.2 Saskatoon’s Winter Strategy Implementation Plan & Comprehensive Engagement Report

There are two documents of relevance to the implementation process, both published in April 2021. The first report provides more information on the policy actions. The second report is a detailed account of the community engagement methods used to develop the actions. Both documents are explored in this section.

Implementation Plan. The format of this document again borrows heavily from Edmonton. The following information is provided for each of the 25 actions: Existing supports,

identified partners from the City and community, quantitative and qualitative measures of success, a timeline, funding, and community prioritization (City of Saskatoon, 2021a, p. 8). The existing supports include examples like recent policy changes, relevant city-run programs, and links to existing strategies. City partnerships list departments and organizations such as Saskatoon Transit, while community partners include citizen interest groups and associations. Measures of success vary based on action, but typically entail a numerical indicator (e.g., higher participation rates). The timeline has three designations: Ongoing, medium term (less than five years), and long term (over five years) (City of Saskatoon, 2021a, p. 9). Community prioritization was determined through engagement by asking participants to rank each action from low, medium, or high priority (City of Saskatoon, 2021a, p. 9). No actions were rated as low priority, while nine actions were rated as medium priority and 16 actions were rated as high priority. The end of the document provides three “next steps” for implementation. First is to consider community feedback in completing the actions, second is to make funding allotments in the City’s budget, and third is to regularly provide progress updates to City Council (City of Saskatoon, 2021a, p. 39).

Comprehensive Engagement Report. This report is a companion to the *Implementation Plan*, covering engagement activities between January 2020 and February 2021 as they relate to developing implementation strategies. The engagement process can be summarized in four broad steps. First, they held workshops during the creation of *Saskatoon’s Winter Strategy* which generated feedback enabling a draft for the *Implementation Plan* to be written. Second, the plan was modified following online survey feedback from stakeholders who worked on the original strategy document. Third, feedback from the public was solicited via an online survey. Fourth, the final document was revised to reflect engagement results (City of Saskatoon, 2021b, p. 4).

A caveat acknowledges COVID-19 restricted their ability to hold in-person activities, which may have limited their total engagement reach (City of Saskatoon, 2021b, p. 6). Online surveys were the only method used to gain feedback on drafts. Response to the stakeholder survey was limited with only six participants (City of Saskatoon, 2021b, p. 14). The public survey was more successful with 73 participants, but this number was also considered a low turnout for online surveys by Saskatoon’s own standards (City of Saskatoon, 2021b, p. 18). Responses are summarized in tables and charts with analysis of the results provided.

An appendix for the document includes a full list of recommendations made by survey respondents. For each of the 25 actions, the recommendations are provided in point form, with common themes highlighted by the authors. These results carry a disclaimer that not all recommendations are financially, legally, or otherwise feasible, but all will be retained for the City's consideration (City of Saskatoon, 2021b, p. 34). Ultimately this document makes it clear how critical engagement was to the development process.

Key Ideas and Takeaways. Throughout the *Implementation Plan*, there is an emphasis on interventions already occurring. Saskatoon's approach was to initiate their quick wins early, practice community engagement throughout, and craft their strategy around continuing these actions while planning for more ambitious long-term objectives. Community engagement was paramount to the development of the strategy. Although the total number of responses was low, the surveys were influential in setting priorities and determining approaches to implementation.

4.3.3 WintercityYXE Background Report

The *Background Report* is the most recent document for the WintercityYXE initiative. Most of the contents of the report have been covered by earlier documents: There is a collection of existing winter programming, a summary of the community engagement process, a list of quick wins, and an update on the next steps. There is some new relevant information, such as formally stating Saskatoon was heavily influenced by Edmonton's approach. The process started after Saskatoon officials attended Edmonton's 2015 conference on winter cities and returned with a plan to adapt their strategy for use in Saskatoon (City of Saskatoon, 2021c, p. 13).

More information on the engagement process for development of *Saskatoon's Winter Strategy* is also provided, starting with a workshop in March 2016. This workshop set the direction for the strategy, as discussions focused on utilizing existing assets, improving winter mobility, and increasing winter events and festivals (City of Saskatoon, 2021c, p. 14). 2017 saw more engagement opportunities through roundtables, online surveys, and a guide for discussions at home, reaching a total of 770 people (City of Saskatoon, 2021c, p. 14). Further, Saskatoon hosted the 2019 Winter Cities Shake Up Conference with the support of Edmonton to help raise awareness of the *WintercityYXE* initiative (City of Saskatoon, 2021c, p. 20).

Key Ideas and Takeaways. Several years in the making, Saskatoon remains in the early stages of implementing their plan. The *Background Report* reinforces the importance of community engagement in every stage of the development process, highlighting early contributions from the public in setting policy direction. While an evaluative report is not yet available, the adaptation of Edmonton’s acclaimed strategy bodes well for Saskatoon’s future.

4.4 Buffalo, New York

Buffalo represents the most recent of the three precedent cities to proceed with a winter city strategy, created under different circumstances than Edmonton and Saskatoon. Buffalo’s strategy was the result of participating in *Wintermission*, an initiative by the non-profit organization 8 80 Cities. The goal of *Wintermission* was to “combat social isolation and increase levels of physical activity in winter for all residents, no matter their age, ability, socio-economic, or ethnocultural backgrounds” (8 80 Cities, n.d.). Two informative documents, the *Community Engagement Summary Report* and the *Winter City Strategy* are explored next.

4.4.1 Wintermission Buffalo: Community Engagement Summary Report

The project followed a swift and linear timeline. In January 2019, Buffalo, alongside Eau Claire, Wisconsin and Leadville, Colorado, were selected to participate in *Wintermission* (8 80 Cities, 2019, p. 6). Initial community engagement took place from March to April, pilot projects were planned from May to September, and projects were implemented from October to March 2020 (8 80 Cities, 2019, p. 6). The *Winter City Strategy* was to follow in July but was ultimately completed in December.

Background. With 8 80 Cities as the project coordinators, a lead team of eight people with representatives from the City of Buffalo and local interest groups was established, as well as a much larger “Winter City Coalition” with dozens of community stakeholders (8 80 Cities, 2019, p. 7). Early in the process, existing strengths were identified as building blocks for the projects. The strengths were grouped under three themes: A culture of service, a history of transformation, and committed leadership (8 80 Cities, 2019, p. 9).

Engagement Methods. The initial engagement process included 32 sessions reaching over 600 people and resulting in over 5,000 pieces of feedback (8 80 Cities, 2019, p. 11). Engagement methods included print and online surveys, an outdoor neighbourhood party, pop-up

events, focus groups, and workshops (8 80 Cities, 2019, pp. 12-13). Through these engagement sessions, community priorities were collected and synthesized into four preliminary themes for the strategy: *Winter snow clearance*, *winter warmth*, *winter programming*, and *winter inclusivity* (8 80 Cities, 2019, p. 19). Pilot projects were then developed based around these themes.

Pilot Projects. For each theme, 3-4 pilot projects were proposed to address community concerns about winter. Since this document was published in July 2019, work had only just begun on the projects. Information on each project is limited to a title and a 1-4 sentence description. For example, under the theme of winter warmth, pilot project 2.4 is titled “light up the dark” and the description says, “add more lighting in public spaces to create sense of warmth when the sun sets early” (8 80 Cities, 2019, p. 22). The final section of the document indicates these projects will be initiated, evaluated, and eventually formulated into the *Winter City Strategy* (8 80 Cities, 2019, p. 26).

Key Ideas and Takeaways. Collaboration is again shown to be a foundational element of developing a winter city strategy. This is demonstrated through two stakeholder groups and the community engagement process. Further, Buffalo is one of three cities to participate in *Wintermission*, reinforcing the theme of partnerships in the planning process. However, there are no references to Eau Claire or Leadville in this document, so it is unclear what information was shared between the three cities in developing their strategies.

4.4.2 Wintermission Buffalo: Winter City Strategy

The *Winter City Strategy* is a 10-year strategy aimed at improving winter quality of life in Buffalo. The strategy builds on everything in the *Community Engagement Summary Report* and draws on additional feedback and precedents from other winter cities. The vision statement sees Buffalo as:

A city where people celebrate and embrace winter as an opportunity to connect across generations, languages, classes, and cultures. We envision a future in which Buffalo’s city and community leaders alike generate and participate in winter initiatives that empower our most vulnerable residents to be active in winter. Ultimately, our hope is that Buffalo will be seen as a welcoming destination to live, work, and play year-round. (8 80 Cities, 2020, p. vii).

The major sections of the strategy include a background summary of activities to date, the results of the pilot projects, and the strategic recommendations.

Background. The first part of the document is largely review and summarization. Among the new information is a section devoted to social isolation, exploring an aspect of winter which does not receive much attention in the literature on winter cities. The causes of social isolation are attributed in part to transportation access, poverty, unemployment, a lack of quality public spaces, and physical impairments, with winter weather cited as an exacerbator (8 80 Cities, 2020, pp. 6-8). COVID-19 is also discussed in this section for the impact the pandemic had on social isolation, with attention paid to racial inequalities in healthcare, employment, income, and wealth (8 80 Cities, 2020, pp. 8-10). The background provides further insight into the goals of 8 80 Cities and how a strategy must consider the local context.

Pilot Project Evaluation. Although the previous document outlined 15 proposed pilot projects only, four were carried out. Each one was intended to represent a community priority area. To evaluate each project, a series of successes, challenges, and suggestions were provided. For example, the first project was a microgrant program. The intention was to provide community groups with small sums of money (up to \$750) to run snow clearing programs in their neighbourhoods (8 80 Cities, 2020, p. 23). A strength of the program was flexibility in the application, allowing for community-specific solutions, while low participation was cited as an issue to be addressed through increased marketing resources (8 80 Cities, 2020, pp. 24-25). The other three projects included running winter programming in city parks, distributing home-weatherization kits, and creating a winter events guide. The projects were considered an overall success, with praise given for their small-in-scale and low-in-cost approach and the unintended effect of encouraging other City departments and organizations to try their own pilot projects (8 80 Cities, 2020, p. 32).

Strategic Recommendations. The preliminary themes from the initial round of community engagement were adapted into “pillars” of the strategy, with the small change of “winter snow clearance” expanding into “winter accessibility” (8 80 Cities, 2020, p. 34). For each pillar, there is a vision statement and background information rationalizing the need for interventions in that area. There are 6-10 recommendations for each pillar, with a grand total of 28 recommendations. For each recommendation, there is a timeframe, budget estimate, equity impacts, case study, and list of potential partners (8 80 Cities, 2020, p. 35). Timeframes are measured based on the estimated time to complete the project from start to finish, with most

recommendations taking two years or less to implement. Budget estimates are presented in large ranges, with symbols denoting values of \$1,000, \$10,000, \$100,000, or \$1,000,000. Equity impacts are statements explaining how each recommendation helps improve social equity in Buffalo. Case studies draw exclusively on examples from cities in the United States and Canada. Potential partners include municipal departments, non-profits, community groups, and private businesses.

Notable absences from the strategy are funding sources, an implementation strategy, and measures of success. At the end of the document is a series of next steps to sustain *Wintermission* going forward. These include suggestions on appointing a project lead, forming working groups for each pillar to implement the recommendations, and to create measures of success for monitoring (8 80 Cities, 2020, p. 56). There is also a suggestion to create a report reviewing the first five years of implementation, though it is unclear when the implementation process will start.

Key Ideas and Takeaways. Buffalo is still in the early stages of deploying their *Winter City Strategy*. While they appear to have taken some inspiration from Edmonton and Saskatoon, the local context of Buffalo has clearly been considered and features prominently in the vision and rationale of the strategy. COVID-19 also appeared to be a considerable challenge to the *Wintermission* team. The ambiguity of the next steps casts uncertainty on the future of the project, with no project lead in place and only a vague suggestion for working groups to guide implementation.

4.5 Summary

This chapter reported the findings from the exploration of policy documents from Winnipeg, Edmonton, Saskatoon, and Buffalo. Winnipeg was presented first in the context of research question one. The City's master plan, secondary plan, and the documents said to guide the creation of the secondary plan were reviewed for evidence of seasonal thinking, with mixed results. Some documents took the opportunity to proclaim Winnipeg a winter city or outline a vision where Winnipeg is a leader among winter cities, but these documents were the exception rather than the norm. Just two documents made a point of considering all four-seasons consistently throughout the policy. Few policy documents contained any references to winter

considerations at all, even in passing. Most importantly, Winnipeg was found to lack a winter city strategy or anything resembling one.

The other three cities were explored as precedent studies, with the results intended to inform a solution for Winnipeg. Edmonton developed an award-winning strategy attracting international attention and praise, seemingly achieving their goal to be recognized as a world-leader among winter cities. As the longest-running strategy of the three, Edmonton has implemented many of their actions and achieved several of their goals. Edmonton has also made important contributions to winter city planning theory, namely the *Winter Design Guidelines* which consolidates techniques commonly found in the literature alongside new ideas.

Saskatoon developed their strategy by adapting Edmonton's approach. Their strategy demonstrates the ability of a smaller city to replicate successful ideas from other jurisdictions. Saskatoon kept the big ideas from the Edmonton strategy and adjusted their approach to fit their local context. Of note from Saskatoon is the implementation of "quick wins" early in the process and before drafting their strategy. This approach created community support for the initiative which allowed the momentum to carry over into the planning stage.

Buffalo's strategy is in the earliest stages of the three precedent cities. Unlike Edmonton and Saskatoon, the winter city initiative was driven by an external entity, the non-profit organization 8 80 Cities. Much of their development process was comparable to the other two cities, but a stark departure is the lack of an implementation strategy and monitoring plan. Apparent through all three precedents was the importance of community engagement to decide goals, the need for collaboration from the public, private, and non-profit sectors, and the importance of utilizing local context to build on existing strengths.

5.0 Analysis and Application

This chapter has three aims: To interpret the findings from the policy review of Winnipeg through SWOT analysis, to synthesize the lessons from Edmonton, Saskatoon, and Buffalo, and to apply those lessons to the Winnipeg context by developing a winter city strategy framework.

5.1 How Winnipeg's Planning Policies Address Winter Liveability

Winnipeg's approach to addressing winter liveability leaves much to be desired. The City's highest level planning document, *OurWinnipeg 2045*, contains no explicit references to winter whatsoever. However, the policy is not necessarily incompatible with winter city principles, as there is a theme of sustainable development underpinning the direction of the plan. *Complete Communities 2.0*, the secondary planning document, does make a few brief references to enhancing year-round function of the built environment. Though brief, there is also a direct reference to supporting the winter city design principles seen in the literature and precedent cities. Unfortunately, there is a lack of follow-through in the guiding documents meant to support the City's planning goals, including the absence of a winter city strategy or equivalent. This leaves no indication of how the winter city principles are intended to be implemented, monitored, or measured. The following section of the report analyzes Winnipeg's current approach for strengths, weaknesses, opportunities, and threats to addressing winter liveability.

5.1.1 Strengths

The lack of a winter city strategy does not mean Winnipeg is doing nothing to enhance winter liveability. For instance, all three precedent cities referenced Winnipeg's winter warming huts in their strategy documents, and Saskatoon even borrowed some from Winnipeg for a quick win initiative (City of Saskatoon, 2020, p. 14). There is evidence of seasonal thinking scattered throughout some of the policy documents examined, which may be capitalized on. Two guiding documents emerged as good examples of what seasonal thinking should look like in Winnipeg policies based on their similarity to documents from the precedent cities. The *Winnipeg Pedestrian and Cycling Strategies* report prepared by Urban Systems is consistent with the approaches taken by the precedent cities to develop their strategies. The report starts with a vision of Winnipeg being recognized for year-round mobility for pedestrians and cyclists, uses community engagement to identify existing barriers, and proposes actionable solutions backed

by strategies for implementation. *Go... to the Waterfront* is the other document which embeds year-round design principles throughout the text. While this document is more hypothetical and much less thorough than the former, each area of the city discussed includes design considerations for all four seasons to maximize the value of its public spaces. Additional documents demonstrate winter considerations to varying degrees. *Winnipeg's Climate Action Plan* recognizes the challenges of the local climate regarding emissions from reliance on heating and cooling systems year-round. The *Transit Oriented Development Handbook* explains how cold weather can be overcome through physical design. The *City of Winnipeg 2015 Accessibility Design Standard* includes considerations for snow and ice management on pathways. Some mentions of winter liveability are not as obvious as these examples.

Implicit references to year-round design are also present in some documents. That is, strategies that may enhance winter liveability without this being clearly stated as the intent. Multiple documents reference the need to preserve trees where possible during development or redevelopment. Trees create windbreaks that can improve thermal comfort in winter (Yilmaz et al., 2020). The *Winnipeg Transportation Master Plan* calls for frequent and reliable rapid transit, which increases mobility and rider comfort in cold weather. Both *Complete Communities 2.0* and the *Downtown Parking Strategy* call for increased infill development, which can reduce snowdrifts and mitigate wind (Setoguchi, 2004). Most importantly, *OurWinnipeg 2045* urges sustainable growth through compact development. While this may have come from a cost-saving and climate change mitigation perspective, compact development can improve winter liveability by enabling walkability in cold weather and increasing the efficiency of snow clearing operations (Robson, 1987, p. 13). These are not the only examples, but they demonstrate the need to look below the surface of these policies.

Another strength present across these documents is a willingness to collaborate with various stakeholders. This is something the City of Winnipeg has already recognized as essential to achieving other planning goals. Each of the precedent cities made it clear that collaboration was essential to their process. From public engagement to implementation, the task of creating a winter city strategy is not to be completed in a vacuum by city planners alone.

5.1.2 Weaknesses

As demonstrated in 5.1.1, Winnipeg has several policies consistent with winter city planning theory. This raises the question: Is the lack of a dedicated winter city strategy a weakness in itself? Arguably yes. A dedicated strategy presents several opportunities to address winter liveability in ways which are absent from Winnipeg's existing policy documents. Taking a holistic approach, for instance, is impossible without an overarching vision backed by goals and measures of success. Policy documents currently address winter planning in piecemeal. A select few prioritize winter, some include passing references, and others fail to consider winter at all. The *City of Winnipeg 2020 Infrastructure Plan* is one such document which surprisingly makes no considerations for winter planning needs. Compare this to Edmonton listing winter-ready infrastructure as essential to their strategy, suggesting a missed opportunity for Winnipeg.

The lack of a holistic approach means some avenues for improvement are left unexplored. Most notably is the sociocultural realm. All the interventions outlined in 5.1.1 target the physical environment, but this completely ignores the culture change which must accompany them to achieve community buy-in. One of the ways to achieve this buy-in is to involve citizens in the decision-making process, which is not presently occurring in the ways necessary to create a culture of winter celebration.

Another weakness is the discrepancies between policies. This has manifested itself through two identifiable issues. First is the lack of consistent language throughout the various policy documents. *Complete Communities 2.0* organizes itself into visions, goals, and policies. In contrast, the *Winnipeg Transportation Master Plan* uses key direction, directions, and enabling strategies, while *Winnipeg's Climate Action Plan* uses strategic opportunities, key directions, and actions. Each of those hierarchies are effectively describing the same thing: The recommended steps to achieving a desired planning outcome. While this may seem like a superficial gripe, the inconsistent language makes it difficult to identify where priorities are aligned across the City's plans. In turn, this makes implementation a more convoluted process because the guiding documents do little to connect to and support each other.

The second and larger issue is follow-through. While *Complete Communities 2.0* lists "winter city design" as a policy, there is little to support implementation beyond a one sentence description. The same could be said for *Go... to the Waterfront*, which is largely visionary and

includes no information on implementation strategies. Without any existing or proposed supporting guidelines, there is no accountability or assigned responsibility to ensure success for these ideas. These and other issues are again problems which could be solved through the creation of a winter city strategy.

5.1.3 Opportunities

Both the identified strengths and weaknesses present opportunistic starting places to enhance winter liveability. As part of a winter city strategy, all existing policy documents should be reviewed and updated. A document like the *Winnipeg Pedestrian and Cycling Strategies* exemplifies the type of seasonal thinking the City needs for success, providing a blueprint to which other documents can conform. Winnipeg could also look to the climate change plan and extend the line of thinking which essentially asks, “How does our climate affect our planning approach?” to all areas of planning. This review period would also be an ideal time to establish consistent language to be used throughout all policy written by and for the City. Connections between policy documents should be made at every opportunity. Not just for achieving winter city goals, but for ease of the overall planning and implementation process.

A winter city policy would provide the opportunity to address the social deficiency of winter life in Winnipeg. Some of the existing strategies like *Go... to the Waterfront*, which target the built environment, could intrinsically encourage more winter social activity. However, this is not stated as a goal meaning there is no additional support in the way of funding opportunities or measures of success. This lack of attention to winter social life in the documents also means existing successful winter events like Festival du Voyageur are not fully utilized in the challenge to change perceptions of winter.

Working with what you already have was a recurring theme amongst all three precedent cities. Take Winnipeg’s skywalk system for instance. While planning theory has largely reversed course and discourages skywalks, there is obviously no sense in dismantling the system. Afterall, Winnipeg experiences periods of extreme cold which makes venturing outside a legitimate health risk. The skywalk should be maintained for these reasons. Instead, thermal comfort in the built environment should be improved so pedestrians *choose* to go outside whenever possible. Making winter-use of the skywalk a worst-case-scenario instead of the default should be a design priority for Winnipeg, and that starts at the street-level.

The biggest opportunity for Winnipeg is to learn from other jurisdictions. Leaning into a winter identity is a major part of being a winter city, and consistent with Winnipeg joining WWCAM. This has been successful in other cities. A banner outside of a Finnish airport reading “Nobody in their right mind would come to Helsinki in November. Except you, you badass,” welcomed visitors to the capital city (Morris, 2016). The humorous display of self-awareness proved to be successful marketing, as the sign went viral online shortly after. Winnipeg could draw on this story by, for example, leaning into the nickname “Winterpeg, Manisnowba” for branding as part of a tourism campaign. No amount of policy can change the weather, but it can change perceptions of weather.

5.1.4 Threats

Without the considerations afforded by developing a winter city strategy, Winnipeg’s current approach faces one big threat. Climate change is anticipated to reshape the winter experience in Canada, and many of the effects will be felt by the time *OurWinnipeg 2045* runs its course. Aside from cycling infrastructure, the most prominent winter strategy Winnipeg employs is increasing access to the river skating trail through the *Go... to the Waterfront* plan. An overreliance on this strategy could leave the city vulnerable to the impacts of climate change. In recent years, the river trail has proven to be an unreliable source of recreation. After a record-breaking run of 76 days in the 2018-19 winter season, irregular freezing patterns along the Red and Assiniboine Rivers did not allow any river trails to open in 2019-20 (Benedictson, 2020). The following winter, unseasonable warmth reduced the trail season to approximately 49 days (CBC News, 2021).

Although these instances may not be directly related to climate change, they serve as a reminder of what may be to come. When the river trail failed to open in 2019-20, ice crews at the Forks instead opened 2 km of overland trails (Benedictson, 2020). While this may seem like a simple solution, climate change directly threatens the long-term viability of outdoor skating in general. Researchers at the University of Waterloo project the outdoor skating season could shrink by 19–34% across Canada as the century draws to a close (Schwartz, 2018). Data from the Climate Atlas of Canada reveals Winnipeggers will not have to wait until 2100 to feel these effects. Table 11 compiles data relevant to Winnipeg winters, bound by the months of December, January, and February.

| | Baseline (1976 – 2005) | Low Carbon (By 2050) | High Carbon (By 2050) |
|----------------------|-----------------------------------|---------------------------------|----------------------------------|
| Mean temperature | -15°C | -12.4°C | -12.2°C |
| Number of -5°C days | 139.1 | 122.7 | 122.3 |
| Number of -15°C days | 79.0 | 62.9 | 62.0 |
| Number of -30°C days | 12.3 | 5.1 | 4.4 |
| Precipitation | 65 mm | 73 mm | 72 mm |

Table 11: Climate Atlas (2021) projections for Winnipeg winters under low and high carbon scenarios.

The low carbon scenario depicts a future where mitigation efforts result in lessening the effects of climate change compared to the high carbon scenario, which represents no mitigation efforts. Winter temperatures are expected to increase on average, reducing the expected number of days below 0°C. Combined with growth in precipitation totals, this could increase instances of freezing rainfall in Winnipeg. Winter rain could disrupt maintenance of outdoor skating facilities and fundamentally change the way Winnipeg experiences winter. A true winter city must be ready for this reality.

Of note is how similar the projections are under both low and high carbon scenarios, implying Winnipeg must prepare for this reality regardless of the mitigation actions taken. While the City has a climate plan, there are no considerations for how climate change will impact winter liveability. This is not to say Winnipeg should stop investing in the riverfront as a winter recreation option. The river should be enjoyed for as long as it is safe and possible to do so. However, future plans beyond *OurWinnipeg 2045* must acknowledge this threat and prepare for a transition to more overland winter programming. Support in the way of a winter city strategy would be an appropriate way to do this.

5.2 Lessons from Edmonton, Saskatoon, and Buffalo

All three precedent cities address winter liveability through a dedicated winter city strategy. The strategies explored in this report are more similar in approach than they are different, but even subtle differences offer lessons for Winnipeg. The precedents are discussed collectively, segmented by the three main phases of the general planning process.

5.2.1 Pre-Planning

Each city began with a vision. For Edmonton, this meant being a world-leader among winter cities by embracing winter in every way possible. Saskatoon envisioned their city as accessible,

active, and inclusive, while Buffalo built on this vision with a larger emphasis on social equity. These visions share the same endgame of creating vibrant winter communities, but subtle differences provide a local flavour to the initiatives. For instance, Edmonton recognized they were positioned to lead by example and successfully framed their vision around this opportunity. This is reflected in the way other cities now look to Edmonton for guidance. The lesson here is to play to the strengths of your city when envisioning success.

As the first of the three to develop their strategy, Edmonton has a clear influence on Saskatoon and Buffalo. Saskatoon declaratively took inspiration from Edmonton's strategy, and stakeholders from Buffalo attended the Saskatoon-hosted Winter Cities Shake Up Conference (80 Cities, 2020, p. vi). This created a trickledown effect of ideas. For each city, the process started by looking toward other jurisdictions. Consistent with the ideals of Pressman, Edmonton drew on these inspirations and localized them to their context, with Saskatoon and Buffalo following suit. Edmonton's leadership established a think tank of public, private, and non-profit stakeholders from within the community and province, as did Saskatoon on a smaller scale. Since Buffalo's movement was driven by an external entity, 80 Cities, their committee had less of a municipal government influence. Buffalo also created two separate committees, an eight-person lead team and a coalition of organizations, however the duties of the latter are unspecified. The creation of these teams and partnerships brings expertise to the project, allows the workshopping of ideas, and the implementation of the eventual strategies. People are a resource, and although the size of these groups vary by city, they are completely voluntary positions and are limited only by a willingness to participate. By identifying these partners at the beginning of the process, the vision is shaped by locals. This is a form of public engagement itself. The lesson here is to identify partners early in the development process and get as many people on board with strategy development as possible.

5.2.2 Planning

In developing their winter city strategies, each city generally took the same steps in a different order. Edmonton's think tank drafted thematic goals which they brought to the public for feedback, prompting revision and further public engagement before finalizing their strategy. Saskatoon started by promoting existing winter events and funding new ones to engage the community prior to drafting their strategic goals. Buffalo began by leveraging existing strengths

to frame their engagement approach, drafting thematic goals from that feedback, and then running pilot projects to inform their strategy. In this case there was no right or wrong approach. The order of events is not as important so long as the desired outcome is achieved. Each city wished to build on what they already did well to raise community support for the winter city initiative, a point of success for all three. The lesson here is to engage early to build excitement and engage often to generate meaningful feedback.

Methods of engagement informing the strategy varied by city. Edmonton balanced the quantity and quality of engagement by starting with a large symposium event and following up with 20 engagement sessions over six months. Saskatoon, as previously mentioned, engaged with the community through in-person events, and built their entire strategy around this engagement. Buffalo emphasized quantity of engagement, using a variety of methods such as surveys, focus groups, and pilot projects to generate large amounts of feedback. How feedback was used also differed. Edmonton used feedback to develop specific goals and actions in the strategy and in the overall revision process of the strategy. Saskatoon framed every step of the process around engagement, while Buffalo synthesized feedback to create their themes and develop pilot projects. In planning theory, public engagement exists on a continuum ranging from non-participative manipulation of citizens to complete citizen control and power over planning decisions (Arnstein, 1969). Although none of the precedent cities allowed for full citizen control, there were instances which came close. For example, Buffalo's microgrant pilot allowed participants to run snow clearing operations in their own neighbourhoods at a very low funding cost. Overall, each city's process emphasized the importance of using citizen feedback by relating back to the choices made in their strategies. There does not appear to be a clear-cut best practice from the three cities. Edmonton using experts to determine their themes based on the body of literature is a valid approach, as is the direct use of resident feedback in Buffalo. The lesson here is to diversify engagement methods and empower citizens to participate in the process as much as possible.

Present throughout the literature is the call for a holistic approach recognizing the relationship between different aspects of the winter life. Edmonton's four pillars of *winter life*, *winter design*, *winter economy*, and *winter story* are derivative of Pressman's (1996) domains of *physical environment*, *culture*, *bio-physiology*, and *economy* (p. 527). Saskatoon, drawing on

Edmonton’s themes, further simplified them into *winter economy*, *winter culture & life*, and *winter design*. Borrowing language from Edmonton, Buffalo also called their themes “pillars”. Buffalo however settled on *winter accessibility*, *winter programming*, *winter warmth*, and *winter inclusivity* as their themes in consultation with the needs of their community. The themes are summarized in Table 12, grouped by similarity to Pressman’s original domains.

| Pressman | Edmonton | Saskatoon | Buffalo |
|----------------------|----------------|-----------------------|----------------------|
| Physical environment | Winter design | Winter design | Winter warmth |
| Culture | Winter story | Winter culture & life | Winter inclusivity |
| Economy | Winter economy | Winter economy | Winter programming |
| Bio-physiology | Winter life | - | Winter accessibility |

Table 12: Thematic groupings for winter city domains.

Collectively, the themes share varying degrees of overlap. Physical accessibility and warmth are design issues, while programming and inclusivity are tied to economy and culture respectively. These differences represent local priorities. Ultimately, the labels themselves are not important so long as they represent these priorities and provide a holistic approach to addressing them. The lesson here is to draw on the existing body of knowledge and adapt where needed, while employing a holistic approach to addressing liveability in winter cities.

Development time in this phase varied for all three cities. From project initiation to strategy publication, Edmonton took approximately 2 years and 4 months, Saskatoon took 4 years and 6 months, while Buffalo took 1 year and 11 months. Factors influencing development time include resources, approach, and constraining factors. Edmonton had the largest team, Saskatoon chose to implement and evaluate several ideas during the development process, and Buffalo cited roadblocks associated with COVID-19. There is also a seasonal consideration to be made. Pilot projects focused on winter interventions require waiting for winter conditions. The shorter development time appeared to hinder Buffalo, with “pilot period too short” listed as a challenge for one such project (8 80 Cities, 2020, p. 25). Further, Buffalo’s strategy was the least developed of the three. Edmonton and Saskatoon quickly released their implementation plans the year following their strategies, while Buffalo simply identified creating teams to create the implementation plan as a future step. The lesson here is to manage time effectively against resources and to take additional time when necessary.

5.2.3 Post-Planning

Each of the precedent cities have taken steps to support the implementation, monitoring, and evaluation of their strategies, to varying degrees. As the precedent city with the oldest strategy, Edmonton has had the time to act on all three. By identifying project leads, potential partnerships, measures of success, and sources of funding during the development process, Edmonton was well positioned to execute their strategy. Early returns include the creation of the *Winter Design Guidelines*, fulfilling a key action from the strategy. Edmonton has gone from learning from the literature to informing it, with these guidelines being cited by authors like McDonald-Yale and Birchall (2021) and receiving praise from Pressman in the document's forward. The evaluative report conducted at the four-year mark of implementation concluded Edmonton's best course of action was to continue forward momentum while remaining dynamic in their approach. No major issues or shortcomings were identified as needing attention. Combining these factors with awards from the Canadian Institute of Planners and international attention, Edmonton's strategy appears to be a renowned success. Indeed, the city has become a leader among winter cities as they set out to do in the first place. The lesson here is to design with the endgame in mind. Thinking ahead about the implementation process during strategy development ensures goals are realistic, in turn enabling feasibility and ensuring the continued progression of the project.

In contrast to Edmonton, Saskatoon's strategy is relatively recent. Published in 2020 with the *Implementation Plan* following in early 2021, Saskatoon has not yet had the time to re-evaluate their strategy. Again, Saskatoon mirrors Edmonton's approach in terms of the information provided in their implementation document. They too identify partners, measures of success, and sources of funding. However, there is a clear difference in the "known support currently in place" category for each action. By starting with quick win initiatives at the very beginning of the process, 80% of the actions are listed as already underway in their *Implementation Plan*. This also explains why Saskatoon's strategy development time was much longer than the other two. This approach was a major early success for Saskatoon, providing an immediate return on investment. Since they have so closely echoed Edmonton's strategy and approach, a reasonable assumption is further success will follow for Saskatoon. The lesson here is to start initiatives as early as possible to maximize returns.

In the post-planning phase, Buffalo is a much different story. Like Saskatoon, they completed their strategy in 2020. Unlike Saskatoon, they have no implementation or monitoring plans in place. In the final pages of their *Winter City Strategy*, Buffalo identifies the need to formulate teams to carry out the actions in the strategy (8 80 Cities, 2020, p. 56). They also call for a program leader to create measures of success in concert with those teams. Yet, they do not even have a program lead in place, listing the creation of this position as another next step. The lack of these critical components casts uncertainty on the future of Buffalo’s strategy. Though it is too early to call Buffalo’s approach a success or a failure, these deficiencies are worrisome at best. While Edmonton and Saskatoon completed their implementation plans after the strategy, both cities pledged to do so in their initial strategy documents and delivered the plan within a year. Perhaps this difference can be attributed to Buffalo being driven not by municipal will, but by an external organization. Although there was government involvement, the dynamic is different in that 8 80 Cities completed their duties and then handed the strategy to the City for implementation. To what degree this strategy will be realized is currently unknown. The lesson here is to maintain strong municipal leadership to oversee the implementation of the strategy.

5.3 Eight Steps Toward a Winnipeg Winter City Strategy

This framework aims to aid Winnipeg in the development of a winter city strategy which addresses gaps and weaknesses in the City’s existing approach and builds on strengths, while also incorporating the knowledge gained from the creation of this report. The eight steps are represented in Figure 1. The objective of this framework is not to generate or prescribe specific interventions. To do so would require a team effort from

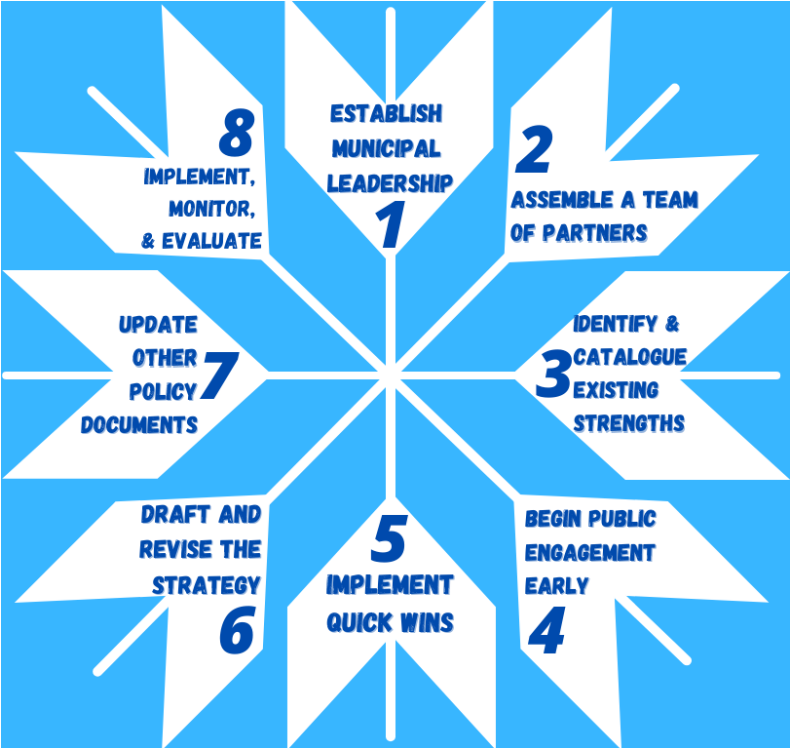


Figure 1: Eight Steps Toward a Winnipeg Winter City Strategy

stakeholders, public engagement, and several years time, all of which are beyond the scope of this report. The framework has been organized into a series of eight steps, all of which are guided by lessons from Edmonton, Saskatoon, and Buffalo and localized to the Winnipeg context. An estimated duration has been included for each step, but these will vary in practice and some steps may occur simultaneously.

Step 1: Establish Municipal Leadership

Estimated duration: 2 weeks.

The City of Winnipeg should begin by establishing leadership. Edmonton’s initiative began with one city councillor, Saskatoon started with a small group of councillors and city staff, and Buffalo was led by the private sector. Municipal buy-in is paramount to the successful implementation of the strategy, so looking within for leadership is the first step in the process. Winnipeg could enlist an enthusiastic city councillor at the mayor’s discretion and task them with creating an official winter city committee to oversee development of the strategy.

Step 2: Assemble a Team of Partners

Estimated duration: 3-4 months.

Emulating Edmonton’s think tank, the second step is to recruit partners from the public, private, and non-profit realms. Having multiple partnerships brings more perspectives and opportunities but a healthy balance should be sought. Winnipeg has no shortage of community organizations to call on. Prospective partners include but are certainly not limited to:

- Bike Winnipeg
- Downtown BIZ
- End Homelessness Winnipeg
- Meals on Wheels of Winnipeg
- Take Pride Winnipeg
- The Forks North Portage Partnership
- The Winnipeg Foundation
- Tourism Winnipeg
- Winnipeg Architecture Foundation

- Winnipeg Art Gallery
- Winnipeg Arts Council Incorporated
- Winnipeg Trails Association

Partnerships should not be restricted based on reach, as some organizations operate at the neighbourhood scale and may already offer winter programming. Further, developing a strategy in tandem with another Manitoba city, such as Selkirk or Brandon, could be mutually beneficial. The partners who agree to participate will shape the direction the strategy takes. Ideally, partners should represent a wide spectrum of interests to ensure a holistic approach can be pursued. This means gaining support from groups that can influence the built environment, social life, culture, and the economy. There should be no limit to the number of participants, but balance should be sought by organizing representatives into thematic working groups. These themes will emerge as the pillars of the strategy. These groups should be organized in such a way that they overlap in interests and bring multiple perspectives. The working groups would be responsible for carrying out Steps 3 through 6.

Step 3: Identify and Catalogue Existing Strengths

Estimated duration: 3-5 months.

Winnipeg has many strengths to build upon, including winter festivals and outdoor programming like the Forks skating trails. The third step is for the working groups to catalogue them. This step serves several purposes including:

- Bringing existing initiatives and programming under the winter city banner
- Locating opportunities for public engagement
- Enhancing civic pride, necessary for changing attitudes toward the winter season
- Identifying prospective quick wins for use in Step 5

The catalogue will prove useful in the later stages of developing the strategy. Having the working groups start from a position of positivity is important for establishing the mindset of celebrating winter early in the process.

Step 4: Begin Public Engagement Early

Estimated duration: Ongoing throughout the development process.

Public engagement was emphasized by every precedent city as vital to the process at each stage of development. The fourth step stresses beginning the engagement process as early as possible. Engagement can take many forms from surveys to workshops to pilot projects, each with varying degrees of citizen involvement. The list of strengths from Step 3 is useful for identifying additional opportunities for engagement. For instance, sending representatives from the working groups to local events to conduct surveys or have informal conversations with citizens.

Engaging with the public could build early excitement around the initiative. More importantly, citizens would be given the opportunity to provide input as the groundwork is being laid, not just afterwards. Effective engagement practices do more than just inform or consult the public, they must actively involve and share the power of the planning process with the public (Arnstein, 1969). Engagement also generates ideas that may otherwise be missed. For instance, Edmonton's engagement process revealed a public desire to reassess risk aversion policies to better enable outdoor play in winter (City of Edmonton, 2012, p. 57). The importance of making winter play easier was expressed in the literature, with Leng et al. (2020) specifying *outdoor* winter exercise as key to combatting cardiovascular disease in senior citizens (p. 2). However, this specific idea came directly from Edmonton's citizenry, demonstrating how public engagement can bring new ideas to the process. The working groups must diversify their engagement methods to holistically inform the process and reach as many people as possible.

Step 5: Implement Quick Wins

Estimated duration: 4-5 months (one winter season).

Consolidating information from the catalogue of existing strengths with feedback from early engagement practices is the fifth step. The working groups should use what they have learned so far to capitalize on quick wins, as Saskatoon and Buffalo did. For instance, the pilot projects in Buffalo were an overall success and demonstrated the demand for grassroots solutions. As seen in the precedent cities, going from initiation to implementation is a multi-year process. Quick wins are useful for generating early returns, building excitement, and maintaining momentum.

The possibilities for quick wins are limited only by the imagination of the working groups. The marquee qualities of quick wins are as follows:

- Requires a low time commitment
- Reflects a public want or need
- Addresses a gap or bolsters an existing initiative
- Necessitates no or negligible funding to complete

Data should be recorded during this step, including participation rates and public feedback. The results from these initiatives will be used to inform Step 6.

Step 6: Draft and Revise the Strategy

Estimated duration: 6-12 months.

By this point, most of the groundwork for creating the strategy will have been completed, so the sixth step emphasizes looking ahead. Prior to drafting the strategy, a visionary roadmap for success should be developed by the working groups. This process begins at the end by determining an idealistic view of what the strategy must achieve to be successful. The roadmap must create an encompassing vision statement and determine the lifespan of the strategy. As the strategy is developed, every recommendation must support this vision. This is also the time to assign responsibility for implementation by creating a role of an overseer, similar to Edmonton's winter city coordinator position. This person should be employed with the municipal government and involved with the development of the strategy.

In drafting the content of the strategy, the themes of the working groups should emerge as the defining pillars of the strategy. This process should reflect all activity conducted to date, including community feedback and the results of quick win initiatives. For consistency, the hierarchical language should reflect what is used in *Complete Communities 2.0*: Goals, objectives, and policies. For every goal developed, it should be clear where the inspiration came from, be it precedents or public feedback. Developing the implementation strategy simultaneously will prove useful in this stage. This means making the following considerations:

- Assigning responsibility for implementation, including monitoring
- Making connections to existing programs or supports

- Listing public, private, and non-profit partnerships
- Determining measures of success so baseline statistics can be recorded
- Defining a realistic timeline
- Estimating costs and proposing sources of funding
- Prioritizing specific actions
- Determining intervals for evaluation

Undertaking these two processes together will keep the strategy grounded, reducing the need to make revisions later. This is also a time saving measure, as implementation can begin immediately after the strategy is approved by council.

This process should not be rushed. If more information is needed, time should be taken to obtain that information. Drafting the strategy will require multiple revisions. Feedback from the public should be sought after the completion of the first draft. One such opportunity for public feedback is to take after Saskatoon and ask community members to rank the priorities. Revisions must be made as necessary following each round of feedback.

Step 7: Update Other Policy Documents

Estimated duration: 4-6 months.

With the strategy completed, the seventh step is to update other City of Winnipeg policy documents to support the vision where appropriate. Revising the other policies reflects the holistic approach of the strategy and provides the chance to create consistency between documents. These documents should be scrutinized to determine where connections can be made between policies. This is an opportunity to address the identified weaknesses in the existing policy documents. A shining example was the lack of enabling policies for using a “winter city design,” as described in *Complete Communities 2.0*. There is no need for the working groups to reinvent the wheel, as localizing the existing body of knowledge is a principle of winter city planning. Instead, permission should be sought to modify and adapt Edmonton’s *Winter Design Guidelines* for use in Winnipeg. Opportunities to adapt from existing material should be acted upon wherever possible to save time and money.

Step 8: Implement, Monitor, and Evaluate

Estimated duration: 10-15 years.

Upon receiving approval from council, the eighth and final step is to immediately begin implementing the strategy. At the discretion of the overseer, the working groups should remain intact long enough to facilitate the form the necessary formal partnerships between the City and relevant stakeholders. From there, the overseer will be responsible for ensuring progress is made for each goal of the strategy. Providing the overseer with the necessary resources, such as a small team, is in the best interest of the strategy.

As progress is made to implement the strategy, monitoring should occur simultaneously. This means collecting data as determined by the measures of success and organizing this information into periodic reports. Regular reporting will be key to maintaining timelines and plays an important role in informing the evaluation process. As part of the monitoring and evaluation process, surveys can be used to gauge public opinion.

Formal evaluations should take place following predetermined milestones as prescribed in the strategy. The numerical lifespan of the strategy is at the discretion of the development team, but evaluations must occur at the end of the initial timeframe. Additional evaluations can occur at the midway point for a shorter lifespan (10 years), or in thirds for a longer lifespan (15 years). The purpose of these evaluations is to ensure actions are occurring on schedule, and to provide an opportunity for revision and course correction where necessary.

5.4 Summary

This chapter achieved the three objectives outlined at the beginning of the chapter. The first was to interpret the findings from the policy review of Winnipeg through SWOT analysis. The analysis determined that while Winnipeg has made some policy decisions consistent with the principles of winter city planning, they are lacking in several key areas. Most notably is the lack of a dedicated winter city strategy around which to organize their approach to addressing winter liveability. Without a strategy, Winnipeg has no vision and lacks the tools to measure success in this area. However, Winnipeg is well positioned to correct this weakness by building on their strengths, taking advantages opportunities for improvement, and addressing threats to their success. The biggest opportunity is to learn from other winter cities, key to the second objective.

The second objective was to synthesize the information from Edmonton, Saskatoon, and Buffalo into lessons for Winnipeg. The biggest takeaway was the necessity of creating a dedicated winter city strategy to address issues of winter liveability. In the pre-planning phase of strategy development, each of the precedent cities emphasized the importance of creating a unifying vision and getting stakeholders on board early. In the planning phase, public engagement was used repeatedly to guide, shape, and revise strategies. In the post-planning phase, the precedent cities diverged as only Edmonton was ready to re-evaluate their strategy, with Saskatoon's implementation process well underway Buffalo stalled. In total, nine lessons for Winnipeg to heed were determined.

The third objective was to apply those lessons to the Winnipeg context through a strategy framework. Eight steps for Winnipeg to take toward a winter city strategy were distilled from the findings of this report. The steps outline the strategy creation process, tailored to suit the needs of Winnipeg by addressing weaknesses in their existing approach to winter liveability. At the core of the steps is the recommendation for a collaborative, holistic approach which incorporates public input and begins with the end in mind. Following the steps of this framework should result in a Winnipeg-made strategy which draws on the strengths of the precedent cities' approaches while avoiding their pitfalls.

6.0 Conclusion

While Winnipeg's climate is not doing the city's reputation as a cold and dark place any favours, the same could be said about existing planning policies. Only one of these factors can be directly controlled by people, so the City should focus planning efforts on improving winter liveability through actionable policy. Drawing on existing knowledge provides a significant advantage to achieving this outcome. Every effort must be made to learn from this knowledge. This report provided insight into the winter city planning literature, the City of Winnipeg's planning policies, and lessons from the precedent cities. They are summarized in turn next, followed by recommendations and areas for future research.

6.1 Major Findings

Literature on winter city planning has long since plateaued. The basics of climate-responsive design, such as maximizing sun exposure and wind calming, have stood the test of time, due to the common-sense solution they provide for the issues winter cities face. Interest in the field has increased in more recent years, with new findings emerging from the global research community. These researchers continue to build on the groundwork of Pressman (1996), and today the focus is largely on determining best practice. Ultimately, winter city planning is concerned with holistic approaches to enhancing winter liveability.

The first research question asked: *To what extent do Winnipeg's policies currently address planning for winter liveability?* Although Winnipeg has officially declared itself a Winter City, the move has not been reflected in policy. A review of the City's newest long-term master plan found no references to being a winter city whatsoever. The secondary plan fared better, with a few instances demonstrating winter city principles. The most explicit example was a declaration to adhere to winter city design. However, no supporting strategies or actions were found in subsequent policy documents. The most implicit example was a commitment to compact design. While this tactic does support winter liveability, this was not the stated intention. On the surface this may seem adequate, but without measures of success relative to winter city planning, there is no way to tell if those outcomes are being achieved. Further, this approach lacks the holistic qualities seen in the strategies of the precedent cities. The lack of follow-through action could be attributed to the guiding documents supporting the secondary

plan. Many of them predate the 2017 declaration of becoming a winter city, but represent an opportunity for positive change.

Despite the weaknesses in their current approach, Winnipeg was found to have several strengths. This includes a pair of exemplary policy documents, which demonstrate the integration of seasonal thinking throughout. Opportunities identified for Winnipeg include expanding on existing strengths, such as the success of the river skating trails at the Forks. Failure to do so leaves the City's winter recreation strategy vulnerable to the threat of climate change, which is expected to change the nature of Winnipeg winters over the life of the current master plan. Ultimately, it makes sense for Winnipeg to develop a winter city strategy as the next move toward becoming a Winter City.

The second research question asked: *What can Winnipeg learn from how other cities have approached winter liveability in their planning policies?* Each of the precedent cities were selected because they developed winter city strategies. Edmonton was the marquee example, taking a leadership role in the winter city community which has earned them international attention. Saskatoon followed their example and adapted the Edmonton approach for their own context. This was considered proof of concept for Winnipeg to do the same. Buffalo also took inspiration from Edmonton, but their process was led by a non-profit rather than City leadership. This made the transition from creating the strategy to implementation more challenging, and Buffalo's progress stalled at this point.

Upon a detailed review of available documents, the three precedent cities were compared for similarities and differences in their strategies to determine lessons for Winnipeg. Among the lessons were the need to play to the existing strengths of the city, to identify partnerships early in the process, to engage with the public throughout, and to start new initiatives as soon as possible to build excitement and support for the project. An incremental, phased approach to the process is encouraged, as this allows for success to build on success. Combining these lessons with Winnipeg's specific context generated eight steps toward a winter city strategy, modeled after the precedent cities. The steps cover the strategy development process from selecting project leadership through monitoring and evaluation.

6.2 Recommendations for the City of Winnipeg

The City of Winnipeg needs a winter city strategy that utilizes the unique context of the city to address winter concerns. As demonstrated by Saskatoon, adapting Edmonton's strategy is a viable option for Winnipeg. Edmonton's efforts have received recognition in the form of awards and praise from planning professionals and winter city specialists. Taken together, these two factors make Edmonton a strong example of best practice Winnipeg can look to for inspiration.

This report outlined eight steps toward a winter city strategy for the benefit of Winnipeg. It is recommended that the City of Winnipeg follow these steps. No matter how Winnipeg's planners approach this issue, they should remember three big ideas. First, engage as many stakeholders as possible early in the process. Second, place community input and needs at the centre of their process. Third, ensure interventions target equally the built environment, the sociocultural realm, and the economy. Only this holistic approach can ensure there is both a will and a way to enhance winter liveability in Winnipeg.

6.3 Areas for Future Research

Future research in this topic area should collect new data. For instance, snow clearing practices is a topic that ties several themes together. Snow clearing is an accessibility issue, a transportation issue, a comfort issue, and a policy issue. Municipal snow clearing practices could have been a standalone project. In my anecdotal experiences in the Broadway-Assiniboine neighbourhood, I consistently saw snow clearing occur several days after snowfall with roadways prioritized over protected bike lanes and sidewalks. Collecting daily data on snow clearing in a logbook over the course of the winter season would have supported or refuted these observations and added to the overall analysis of Winnipeg's priorities as a winter city. This decision would have influenced the direction of this report by shifting the evaluative focus of Winnipeg from theory to practice.

The impending effects of climate change on winter cities represents a gap in the literature and in practice. As demonstrated in the SWOT analysis, Winnipeg relies on the status quo of winter conditions for recreation practices. However, changes to the winter climate are expected to be felt in the near future, and little to no considerations for this have been made by the City or within the literature. Future research should utilize climate change modeling and projections to anticipate how these changes will impact not just recreation, but infrastructure as well.

Winter city planning researchers have shifted their focus from generalist research to determining best practice. However, contemporary research has been criticized by Stout et al. (2018) as being “poorly connected” (p. 9). The research would be better served by greater collaboration across disciplines and nations working toward shared research goals. Centralizing the body of knowledge under the direction of an organization or association could allow clearer organization of ideas and connect researchers with similar areas of interest. This could also provide the opportunity to identify gaps and dead ends needing further research. The Winter Cities Institute is identified as a candidate for this task, though securing a reliable source of funding must be a priority to ensure success.

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