Design Thinking in the Canadian Public Sector: an exploration of suitability for problem solving in policy development through the use of an interdisciplinary design thinking workshop

by

Renée Isaac-Saper

A thesis submitted to the Faculty of Graduate and Postdoctoral Affairs in partial fulfillment of the requirements for the degree of

Master of Design

in

Industrial Design

Carleton University Ottawa, Ontario

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ABSTRACT

The Canadian federal government is constantly in search of processes and approaches to address mounting complex challenges in the public sector. Design thinking is an approach that has been successfully implemented in the Australian government and has been used lately in many Canadian government departments to facilitate innovation. Yet, academic literature about design thinking in the Canadian context of policy development, specifically policy and decision making, is sparse. The research conducted in this thesis furthers new thinking in this area. A design thinking workshop based on a collaborative interdisciplinary approach was used to gain insights into the potential barriers and benefits of design thinking in the Canadian public sector.

Experienced designers and public sector experts were invited to participate in a policy design challenge, at Carleton University, to discuss food insecurity in Inuit Nunangat, an example of a real and complex wicked problem facing the Canadian government. The findings revealed potential alternative solutions requiring increased interdisciplinary collaboration between and among government policy makers and design practitioners, incorporating experienced designers into the policy process with policy experts, and using results to bolster academic literature.

Keywords: design thinking, policy making, innovation, Canadian public sector, interdisciplinary collaboration
ACKNOWLEDGEMENTS

To my supervisor Stephen Field and co-supervisor Heather Dorries: your sustained enthusiasm for this research, contributions, time, guidance and insights have made all the difference to this experience, and for that I am truly grateful.

Thank you to Daniel Giasson for your insights, contributions and advice.

Thank you to Martin Berry, Dione Scott and Blaise Hébert for shedding light on this topic.

To all nine of the participants who attended the workshop, this thesis would not be the same without your help, thank you.

Special thanks to Valerie Daley, Thomas Garvey, Bjarki Hallgrimsson, Lois Frankel, Chantal Trudel, Çağla Doğan, WonJoon Chung and Juan Saavedra for your time, discussion and encouragement throughout this process.

Thank you to my parents Annette and Gerald, for your unwavering love and support in so many ways, I’ve lost count.

Finally, to my family and friends for your kindness and words of encouragement, and to Robbie.
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PREFACE

Equipped with an education in fashion design, I spent several years working in the design field in Toronto, gaining experience as a product and textile designer. I became interested in exploring options where I could apply my design skills to different contexts. This eventually led me to the MDes program at Carleton University in the fall of 2016. I was introduced to the concept of design thinking by Dr. WonJoon Chung and Dr. Lois Frankel in a studio course. The idea that design processes and methods could be applied to social contexts was new and fascinating to me.

Because I had been interested in the topic of Canadian design policy for several years prior to studying at Carleton, it was exciting to come across a potential area of study that could help expand the discussion. I became interested in pursuing design thinking in the public sector after several months in the program, through reading and discussions with faculty members in the School of Industrial Design, and finally with professor Stephen Field. As we discussed design policy, and ways in which policy experts and design professionals could work together to explore design policy development in Canada, the idea of using design thinking as a possible approach emerged, and was solidified after consultation with Dr. Heather Dorries from the School of Public Policy and Administration.

Upon opening up the door of design thinking in the Canadian public sector, I realised there was overwhelming activity in this area. Looking at how design and designers are and could play roles in policy development became the primary focus. This thesis touches the tip of the iceberg, and the possibilities of design’s extension into social challenges is a stimulating area of research which can hopefully lead to meaningful action.
1. INTRODUCTION

There is a need for innovation in the public sector (Government of Canada, 2017h). Design thinking is being implemented as a tool to help facilitate innovative change in the Government of Canada (Government of Canada, 2017e). Mandate letters from the Prime Minister of Canada call for innovation across sectors as other nations have already explored and implemented new processes (Trudeau, 2015a, 2015b, 2017).

A cultural shift in the Canadian public sector is being driven by select departments and initiatives aimed at creating new ways and developing new tools to approach challenges in public policy (Government of Canada, 2017a, 2017h). The drive for innovation comes at a time when society is faced with quickly evolving and new challenges on a regular basis (Government of Canada, n.d). Complex problems such as global warming, effects of climate change, sustainability, food insecurity, reconciliation and healthcare are some of the issues the federal government must address. With such complex problems, having new approaches and skills to address challenges is something the public sector has identified as a need (Government of Canada, 2017h). In a time when societal challenges are becoming ever more complex, policy makers and the policy making process can benefit from creative solutions.

Traditionally, the public sector is not known for applying creative approaches to problem solving, partly due to its large and complex organizational structure. Often working within strict boundaries of limited time, financial resources and contextual information, along with ill-defined problems, policy development can prove to be challenging, and actions from within the public sector can fall short of ideal goals (Favoreu et al., 2016; Forester, 1984). Design thinking is the
process of using creative methods, largely drawn from the design discipline to create new ways of defining and solving problems. Widely used in the business world over the last two decades, due to its success in many ventures (Brown, 2008; Liedtka, 2014; Martin, 2009), design thinking has also become popular in the worlds of finance, healthcare and education (Brown, 2008, 2015, Liedtka, 2014). Its use in policy development in the public sector has also been growing in recent years (Mintrom & Luetjens, 2016). While design thinking is present in some Canadian governmental departments, the explicit motive, implementation process, stakeholders’ abilities in creative processes and evidence of successful application is not well defined.

1.2 Rationale and Purpose of Study

This thesis aims to explore the use of design thinking in the Canadian public sector in policy development, specifically on policy and decision making. A review of literature on the subject has revealed few academic works about design thinking in the Canadian context of policy development. This lack of research inspired questions related to the topic, and this study intends to shed some light on the current state of affairs.

Identifying barriers to design thinking implementation in the public sector is another objective of this thesis. Drawing on the example of food insecurity in the Inuit regions of Canada, an interdisciplinary design thinking workshop was used to focus on the real, urgent and timely policy challenge. Findings from this workshop helped to inform benefits and barriers.

Because design thinking stems from the design discipline, it is worth investigating how traditional design methods are being applied, taught and interpreted by other fields to achieve
innovative results. This research is also relevant to field of design because of the interdisciplinary focus of the study. Exploring how the different fields of design and policy development are being brought together can benefit both disciplines.

1.3 Research Questions

Evidence has shown that internationally, for example in the Australian public sector, design thinking implementation has proven to be successful (Mintrom & Luetjens, 2016). However, findings from the literature about design thinking also show that to fully benefit from the process, it should be implemented as a long-term strategy, be holistically managed and have strong and sound leadership throughout (p. 399).

These findings helped to define the central research question for this thesis:

_to what extent is design thinking an appropriate and sustainable way to approach problems in the Canadian public sector?_

Additional questions that will be addressed are:

- _How and where is design thinking in the public sector being implemented?_
- _How familiar are public servants with design thinking?_
- _What are the benefits and barriers?_
- _What role can designers play in the public sector in regards to design thinking?_
1.4 Collaborative Approach

To answer the research questions, in addition to a literature review, an interdisciplinary collaborative approach, as mentioned, was applied to the research process. A design thinking workshop which included public sector and design experts was organised to collect feedback about the applicability and appropriateness of design thinking in policy development from experienced professionals. Figure 1 outlines the approach used to gain insight into how barriers that were identified in the literature review could be mitigated.

![Interdisciplinary Collaborative Approach to Innovation in Policy Development](image)

*Figure 1. Interdisciplinary collaborative approach to innovation in policy development.*
1.5 Contributions to the Field

The research process outlined in this thesis can help inform academic and professional individuals and organizations in the fields of policy development in the public sector, in Canada and internationally, about the benefits and barriers to implementation of design thinking. It can also serve as a reference for public sector experts to advance their understanding of how design and its methods are not limited to only creating physical products but can be applied to address societal challenges. The findings can also demonstrate how individuals from two very different areas of expertise (design and public policy) can work together to produce a variety of alternative solutions to a real and complex issue facing our society today.
2. LITERATURE REVIEW

The following sections outline the background and uses of design thinking and the central methods highlighted from a review of notable works. An outline of the policy making process and approaches, use of design thinking in policy development in general, and evidence of design thinking use and role of designers in the Government of Canada will be presented.

2.1 Design Thinking

Design thinking is a process that uses a creative approach to problem identification, problem solving and idea generation. Over the last 15 years, design thinking has gained popularity in the business world as a tool for innovation (Brown, 2008, p. 86; Dorst, 2011, p. 521; Kimball, 2011, p. 294; Martin, 2009). The general concept is that when implemented correctly, individuals and organizations can apply traditional design methods to non-design contexts (Brown, 2015; Liedtka, 2014, p. 42). Examples of application include generating strategies to increase competitiveness and using the process to address complex problems. Fields that have applied design thinking include health care, education, finance and government (Brown, 2015; Liedtka, 2014, p. 42; Ted Talk, 2009).

Wicked problems are complex problems that can benefit from a design thinking approach. Wicked problems can be found in many areas of society, are multidimensional, often involving many factors and can therefore be approached in various ways (Buchanan, 1992, pp. 14-16; Rittel, 1973). Design researcher Richard Buchanan argues that many design challenges are wicked problems (pp.14-16), for example climate change, sustainability and homelessness. Traditional forms of problem solving from policy and business perspectives are often entrenched
in heavy analysis of what has been done in the past, and depend on trends and tangible data to inform decisions (Baughn et al., 2014, p. 653; Leidkta & Ogilvie, 2011, p.8; Martin, 2009, p.5). In reality, many of the wicked problems that exist today are new and constantly evolving, making it difficult to apply traditional solutions and approaches that have worked in the past. It is here that design thinking can be a helpful tool in identifying opportunities and challenges in a new light. Used alongside traditional forms of problem solving, design thinking can be a way to achieve effective results (Baughn et al., 2014, p. 653; Martin, 2009, p. 5).

2.1.2 Origins

Design thinking has become increasingly common in contemporary culture and almost mainstream in many different fields (Brown, 2015; Kolko, 2015; Liedtka, 2014; Martin, 2009). However, the study of ‘designerly methods’, how designers think and work, and studies on creativity has been around for decades. Theoretical perspectives then, from many disciplines, have helped to shape the current discourse on design thinking. Contributors include Herbert Simon (The Sciences of the Artificial, 1969), philosopher Donald Schön (The Reflective Practitioner, 1983), Richard Buchanan (Wicked Problems in Design Thinking, 1992), Bryan Lawson (How Designers Think: the design process demystified, 1980), and design researcher Nigel Cross (Designerly ways of Knowing, 1982) (Johansson-Sköldberg et al., p. 123-125).

2.1.3 Contemporary Authors

Since the mid 2000s, literature on design thinking as a tool for innovation and competitiveness has increasingly targeted audiences in the business world. The contributors vary. They include design thinking influencer and CEO Tim Brown (Design Thinking, 2008; & Change by Design,
2009) and business expert Roger Martin (The Design of Business, 2009). Design researcher Kees Dorst is noted for The Core of Design Thinking and Its Application, (2011) & Frame Innovation, Create New Thinking by Design, (2015). Authors Jeanne Liedtka and Tim Ogilvie (Design for Growth, 2011) and Nigel Cross (Designerly Ways of Knowing 2006; & Design Thinking 2011) are often cited. A practical example of how a design thinking approach produced a successful outcome is in the case of P&G (Proctor & Gamble Co.) (Martin, 2009). With good leadership from the company’s CEO, P&G, a traditionally analysis driven organization was transformed into a design thinking organization by implementing the process throughout the company at different levels (Martin, 2009). For example: designers were incorporated into business teams which allowed a design voice to be heard when decisions were being made (Martin, 2009). While much of design thinking literature was geared towards business, its success in the private sector, as shown in the P&G example has made design thinking attractive to other fields such as healthcare and education (Brown, 2015; Liedtka, 2014, p. 42; Ted Talk, 2009).

2.1.4 Methods and Themes from the Literature

While there is an abundance of academic literature on the subject, the core principles of design thinking remain relatively consistent throughout. There is no one specific way to practice design thinking. Different organizations and individuals can adapt various aspects of the design thinking repertoire to fit their needs depending on the problem or aim in question. Some of the fundamental core aspects of design thinking include having a user centred-focus, abductive reasoning, risk taking, acceptance of failure, participatory processes and visualization (Brown, 2008; Cross, 2011; Dorst, 2011, 2015; Kolko, 2015; Liedtka & Ogilvie, 2011; Martin, 2009).
2.1.5 Core Principles of Design Thinking

**Human / user-centred approach:** this principle is central to designing products for users who are the targeted recipients of functional products, systems or services. Much research into and consideration for what users need and want are some of the most important aspects of creating a good design (Brown, 2008; Kolko, 2015; Liedtka & Ogilvie, 2011, pp. 9-10).

**Empathy:** Part of understanding what a user experiences, wants and needs is integral to good design. As a designer or design thinker, putting oneself into the shoes of the end user can produce invaluable insights to help frame problems in new ways (Kolko, 2015; Liedtka & Ogilvie, 2011).

**Participatory processes:** another important part of the design process is involving the end users in the design and consultation phase before decisions are made. This can provide the design team with valuable insights (Liedtka, 2014; Ted Talk, 2009).

**Abductive reasoning:** believed to be one of the central elements of design thinking and one of the most important aspects of a designer’s skillset is ability to use abductive logic (Martin, 2009). ‘Inductive reasoning’ presents an idea of what might be true based on previous experience, meaning each time you do a something under the same conditions, the same outcome is expected to happen (Kolko, 2010, p. 20). For example: the strawberries that grew in the garden last summer were sweet, so all strawberries that grow in the garden will be sweet. ‘Deductive reasoning’ is a more scientific form of logic that can guarantee truthful conclusions if the premises are true (Kolko, 2010, p. 20). For example: the cat always meows when the cupboard is
open, and the cat did not meow, therefore the cupboard is closed. ‘Abductive reasoning’ is a way of thinking and making predictions based on individual intuition, which can be from an accumulation of personal experiences over a lifetime (Cross, 2011; Kolko 2010). Experienced designers have spent decades developing the ability to think differently than others, crafting a unique style of working or thinking which can produce novel and sometimes visionary ideas (Cross, 2011). In the 2011 work, *Design Thinking*, the notion that design intelligence, and natural design intuition is something that some people are born with, and can be further developed through education is presented (Cross, 2011). This form of thinking and working can be difficult to practice for someone with little experience with it. Design thinking methods can be used as tools to produce novel results (Brown, 2008, p. 88), which can help generate ideas as if using abductive reasoning. From a more theoretical perspective, abductive reasoning can be used to hypothesise what makes the most sense based on observations and available data, and questions what could be true (Martin, 2009; Kolko, 2010). In summary, abductive reasoning is the unique ability to think laterally and use intuition to form ideas, as well as making decisions when there are unknowns.

**Risk Taking:** this aspect of design thinking involves trying new methods or making decisions out of the normal comfort zone of what is usually done or expected in an organization and not knowing what the outcome will be (Cross, 2011, pp. 73-75).

**Acceptance of failure:** much of design thinking literature argues that true learning, and sometimes the best solution, emerges after multiple failures and is a natural part of the design process (Cross, 2011; First Round Capital, 2013; Kolko, 2015; Leikdtk & Ogilvie, 2011).
Visualization: representation of information and ideas through visual communication is a common theme in design thinking literature, such as graphs, charts, drawings and models (Baughn, 2014; Cross, 2011; Liedtka & Ogilvie, 2011).

2.1.6 Common Design Thinking Methods

As there are many more than what is presented in this thesis, the following selection of design thinking methods have been chosen to be discussed because of their potential applicability to the policy making process, outlined in section 2.2. These methods could potentially complement the linear nature of the policy making process (Mintrom & Luetjens, 2016, p. 393) by encouraging lateral thinking.

- **Mind mapping:** a visual tool to map out connections to themes and ideas that can help to organize data (Liedtka & Ogilvie, 2011).

- **Journey mapping:** a combination of written and visual elements that describes and illustrates a user’s experience with a product from start to finish, often indicating positive and/or negative points throughout the experience (Kolko, 2015; Liedtka, 2014).

- **Brainstorming:** a group of people writing down as many ideas as possible without too much time spent analysing or researching ideas (Brown, 2008; Liedtka & Ogilvie, 2011).
• **Rapid / low fidelity prototyping**: creating quick iterations of a product using inexpensive materials quickly to realize ideas in physical or visual form (Baughn et al., 2014; Kolko, 2015; Liedtka & Ogilvie, 2011; Martin, 2009).

• **Observation**: observing users in their natural environment where the product will be used to gain insights (Baughn et al., 2014; Brown, 2008; Cross, 2011).

• **Sketching**: drawing to communicate ideas and concepts (Baughn et al., 2014, Cross, 2011).

• **Experimentation**: similar to risk taking but can be achieved on a smaller scale such as trying out new methods, materials or iterations to help achieve a desired outcome (Baughn et al., 2014, Brown, 2008; Liedtka & Ogilvie 2011).

### 2.2 The Policy Making Process

#### 2.2.1 Approaches

Approaches to decision making in policy varies. As stated by John Forester (1984), rational and boundedly-rational approaches are two of the more common problem solving avenues used in the public sector (p. 23). Forester writes that the *comprehensively rational approach* to problem solving is ideal (and often unrealistic) which assumes decision makers have full knowledge of the issue at hand. This includes a well-defined problem, excellent understanding of contextual information and ample resources to address the challenge (pp. 23-24). This approach is characterized by thorough analysis before action and careful, deliberate decisions that can be
controlled to attain a desired outcome (Favoreu et al., 2016, p. 437). Bounded-rationality is an approach where decision makers work within the realistic and more common limits of often poorly defined problems, limited contextual information and limited resources (Forester, 1984, p. 24). This can result in making safer decisions, often based on previous experiences but may not produce the best outcomes as a result (p. 24).

2.2.2 Policy and Policy Making

“Policy is a deliberate action of government (the executive branch) that in some way alters or influences the society or economy outside the government. It includes, but is not limited to, taxation, regulation, expenditures, information, statements, legal requirements, and legal prohibitions” (OECD, 2007, p. 10).

Policy making processes can be in a constant state of evolution overtime (Mintrom & Luetjens, 2016, p. 392). Holding public consultations is a common theme in policymaking, but it is traditionally a linear process with problem definition, identifying options and then developing the policies (pp. 392-393). Similar to what Forester presents above (1984, p. 24), this process is rational but can be difficult to attain best outcomes when working with complex problems, something that is common in the public sector (Mintrom & Luetjens, 2016, p. 393).

Researchers Michael Mintrom and Joannah Luetjens outline 5 stages in policy making (p. 394):

1. Problem Definition
2. Agenda Setting
3. Policy Adoption
Policy making varies between sectors and levels of government. Internal and external influences all play a role in how policy will be formed (Howlett, 2014, p.88). There is a school of thought that believes because it is often so complex, it must evolve naturally. Conversely, another view is that like other forms of design (architecture and urban planning), policy can be designed and improved with study (p. 88).

Paul Joyce, expert on public services and strategies writes that a simple definition of the policy making process permeating all levels of government (federal, provincial, municipal) is that “policy –making is defined as a process instigated by a decision of politicians, and involves work by government civil servants: it produces a policy, which then, in turn, leads to action by government” (Joyce, 2015, pp. 74-75). The government action varies, which can take the form of new laws, new public services and partnering with stakeholders to problem solve as some examples (p.75). The policy making cycle as presented by Joyce in figure 2 is a general reflection of how policy is formulated, not an exact model of what all policy making looks like, as it varies (p.76).
2.2.3 Policy makers

Generally, a politician or political party will present a set of priorities. To help address these priorities, the role of civil or public servants is to help politicians make the best possible decisions (Joyce, p. 78). Some common roles for public servants are to identify key issues, clarify policy goals, perform consultations (this can include consultations with other departments, ministries, the public, other stakeholders), identify policy alternatives, evaluate alternative policies and provide recommendations to the appropriate ministers (p. 79). Public servants tend to work more cautiously in smaller increments to develop policy, largely using deductive reasoning to influence decisions because of risk of failure (Considine, 2012, p. 705), and are often focused on the barriers and constraints of their context (p. 704).
2.3 Design thinking in policy development

Initial research on the use of design thinking in policy development, through academic databases, yielded a small amount of literature. Most notably Design Thinking in Policymaking Processes: Opportunities and Challenges by Michael Mintrom and Joannah Luetjens (2016) and Thinking Outside the Box? Applying Design Theory to Public Policy (2012) by Mark Considine offer valuable insights.

Mintrom & Luetjens examine how design thinking has been successfully used in Australian government policy through the ATO (Australian Taxation Office) (Mintrom & Luetjens, 2016, pp. 391-392). The ATO has used design thinking over the last two decades, and is an example of how the application of a design approach in a complex governmental body can be successfully implemented (Di Russo, 2015). Some of the reasons for implementing a design thinking approach in the ATO include using design to improve how the government’s policy intent is presented, to help transform strategy into action and to improve the tax paying process (Body, 2008). While the process of improving the ATO through a design approach is long term (Body, 2008), some tangible outcomes have emerged. Examples include tax apps and e-tax programs for individuals, interactive online tools and online business viability assessment tools for small businesses (Olesen, 2013).

Mintrom & Luetjens explain that in this case, the Australian government took a holistic approach to problem solving by redesigning the entire tax system instead of band aid solutions such as tax form redesign (p. 392). This holistic approach is a theme in design thinking. The perspective is that, to have achieve best results, design thinking should be practiced at every level of the
organization, department and product development process to be effective in the long term (Brown, 2015; Martin, 2009). One of the core principles in the Australian government example is ease of use, along with clarity (Mintrom & Luetjens, 2016, p. 392).

In general, Mintrom & Luetjens maintain that as public consultations have been a common theme in policy making, design thinking differs by putting a greater emphasis on user feedback and perspective and prioritizes problem definition (p. 393). Furthermore, individuals need specific skills to be able to practice design thinking effectively, arguing that this is a barrier which could be mitigated with training (p. 393). With more design related work in government, comes the increase of people who require design skills (in addition to essential policy making and analysis skills), which is currently lacking (p. 393).

The authors also caution against the use of design thinking for the wrong reasons, stating that the small number of empirical studies on design thinking in the public sector could be a negative factor in influencing organizations to use design thinking because of limited understanding of the process (p. 399). Using design thinking for short term projects could be setting it up for failure and is at risk of not being taken seriously, as implementers might have unrealistic expectations. To expand on the cautions of using design thinking in government, considering this approach to be a ‘fix all’ method for public sector challenges could be problematic. As presented in the literature, successful examples of design thinking implementation in large organizations are being carried out over several years. Using a design thinking approach to address matters of urgency where time for experimentation and skills development is lacking could result in negative consequences. For best results, Mintrom & Luetjens suggest that design thinking works
well as a long-term approach and “requires time, space and authorization to operate” (p. 399) as well as good leadership (p. 399).

Considine discusses the intuitive nature or factor that many creative people have and queries how policy makers can work or think less rigidly to open themselves up to more playful techniques to create new options (Considine, 2012). He presents the idea that some people just have the ability to come up with solutions or ideas naturally, which draws a connection back to literature about abductive reasoning in section 2.1.5. An argument that Considine makes is that a design approach to public policy focuses on the skills of individual policy experts as opposed to focusing on the barriers and constraints of government which is a common fixation in some policy development approaches (Considine, 2012).

2.4 Examples from Canadian government

The drive for innovation across the Canadian public sector (Government of Canada, 2018c) is a potential reason why the popularity of design thinking in government has been increasing over the last few years. Several mandate letters to cabinet ministers from the current Prime Minister of Canada have called for increased innovation across many sectors (Trudeau, 2015a, 2015b, 2017).

The information presented below in table 1 is a summary of projects, units, initiatives and documents relating to innovation and design thinking in the Canadian government. Some methods that fall under the design thinking umbrella have already been considered as approaches to help improve certain aspects of the public service that are facing challenges.
<table>
<thead>
<tr>
<th>Department / Organization</th>
<th>Project / Initiative /Document /Unit</th>
<th>Approaches and Methods Related to Innovation and Design Thinking</th>
<th>Target Area</th>
<th>Date</th>
</tr>
</thead>
</table>
| Government of Canada (across departments and agencies) | Impact and Innovation Unit (Unit) | - Evidence based decision-making  
- Experimentation  
- Co-design and co-creation (Government of Canada, 2017h) | Public policy challenges | 2017 |
| Government of Canada (whole of government) | Blueprint 2020 and public service renewal (Initiative) | - Engagement with public servants  
- Innovation hubs with Innovation labs (Edwards et al., 2015) | Public Service improvement | 2013 |
| Employment and Social Development Canada | Social innovation and social finance strategy co-creation steering group (Initiative) | - Co-creation (Government of Canada, 2017f) | Strategy | 2017 |
| Canada School of Public Service | Student paper winner: Getting to Empathy: fostering Innovation and end user focus in the Canadian public service (Document) | - Innovative processes: human centred focus through empathy mapping and persona definition (Holmes & Krauthaker, 2017) | Improved innovation and end-user focus in the Public Service (2017) | 2017 |
| Immigration, Refugees and Citizenship Canada in collaboration with the Impact and Innovation Unit | Family class design challenge: improving the experience of family class applicants (Case Study III), (Project) | - User centered design (Government of Canada, 2017c; Keung, 2017) | Improve spousal sponsorship process | 2016-2017 |
| Mind-lab for Policy Horizons Canada | Key messages from master class on design-led innovation for the public service (Document) | - Empathy  
- Observation  
- Brainstorming  
- Prototype  
- Testing (Bellefontaine et al., 2013) | Public Service and policy improvement | 2013 |
| Policy Horizons Canada | Canada Beyond 150 (Initiative) | · Human-centred approach  
· Ethnographic research  
· Scrapbooking  
· Stakeholder maps  
· Prototyping  
· Narrative text based analysis  
· Experiential futures (Government of Canada, 2017c) | Public Servant professional development program for skills development, leadership and culture shift, open policy making (Government of Canada, 2017a) | 2017-2018 |
| Policy Horizons Canada | Innovation labs: bridging think tanks and do tanks (Document) | · Divergent and creative thinking  
· Story boarding  
· User-centred solutions  
· Ethnographic / action research  
· Design thinking  
· Co-creation  
· Testing  
· Service journeys  
· Experience maps  
· Story telling  
· Prototyping  
· Whiteboards  
· Character profiles  
· Foresight (Bellefontaine, 2012) | Public Service challenges | 2012 |

*Table 1. Innovation and design thinking in the Government of Canada.*

It is evident from the initiatives and documents presented in *table 1*, that the Canadian government has identified the need for alternative approaches to deal with challenges in the public sector. The majority of the units and initiatives presented in this table are situated in high levels of government. The Impact and Innovation Unit, Policy Horizons and Blueprint 2020 all report to the Privy Council Office, which offers public service support to the Prime Minister and Cabinet (Government of Canada, 2018b). This leads to the question, if creative approaches are
being used in high levels of government as tools for innovation, and design thinking is one of those approaches, how seriously is it being considered for the long term and what role do designers play in government?

2.5 Presence of Designers in the Public Service

Terms ‘designer’, ‘design professional’ and ‘design expert’ in this thesis, refer to a multidisciplinary design professional with design education from a post-secondary institution and professional experience as a designer.

To get a sense of where designers can be found in the federal public service, a preliminary search was conducted through a job database and two government sub-sections that focus on innovation in government:

1. Through a keyword search using the term “designer” in the Government of Canada job search database on March 26\(^{th}\), 2018, out of 711 jobs open to the public, the search yielded 1 result (Government of Canada, 2018a). “Instructional Designer and Technical Writer” with an educational requirement in psychology, information technology or communications was listed (International Development Research Centre, 2018). In this case, the instructional designer does not require a design background and will not be asked to practice design methods.

2. A search through the “About Us” page on the Government of Canada’s Impact and Innovation Unit which outlines the Unit’s staff of 14 yielded zero results for the presence of design professionals (Government of Canada, 2017b).
3. A search through the “Team” page on Policy Horizons Canada website revealed zero titles that included “design or designer”, and 2 individuals with education in design out of 33 staff members (Government of Canada, 2017g).

Results from this preliminary external search yielded a low turnout of design professionals present in the public service. This leads to question of ‘who is helping with the implementation of design thinking in these high levels of government?’ According to a report from the Impact and Innovation Unit, the unit has been collaborating with external organisations to help advance their innovation agenda (Government of Canada, 2017d). Further studies, such as interviews with public sector employees or department heads would be required to determine how (if it is through the means of external organizations) design experts are involved in public sector innovation as well as to identify public servants with design backgrounds.

In summary, this literature review has revealed that:

- Policy making often involves linear processes, either entrenched in analysis and carefully planned actions with little room for error or basing decisions on previously successful outcomes because of constraints (Forester, 1984; Favoreu et al., 2016).
- Experienced designers can have the ability to make decisions based on intuition and non-linear thinking (Considine, 2012).
- Significant time, experience and talent is required for designers to develop their skills (Cross, 2011).
- Design thinking in government has been used successfully in Australia (Mintrom & Luetjens, 2016).
• It is being used in Canadian government as a tool for innovation (see table 1).

• Design thinking runs the risk of not being taken seriously without having a full understanding of what it is, and how it works (Mintrom & Leutjens, 2016).

• Lack of people with design skills in the public sector is a barrier that could be addressed through training (p. 393).

• There are no ‘designer’ jobs titles and very few ‘designer’ descriptions in government departments / databases as presented in section 2.5.

Findings from the literature on policy making demonstrate that because of the common rigidity of decision making in government, due to limited resources and the desire for safe, planned outcomes, there is an opportunity to enable more creative processes for improved policy decisions through the use of design methods, based on design thinking. This opportunity is in part due to the mounting challenges currently facing the public sector (Government of Canada, 2016a; 2017e). It was seen that while design thinking in government can be successful, there are barriers to its implementation, and the presence of design professionals in the public service appears to be low. This leads to the central research question: to what extent is design thinking an appropriate and sustainable way to approach problems in the Canadian public sector? And additionally, what role can designers play regarding design thinking in the public sector as a potential way to mitigate some of the barriers? The research outline in figure 3 illustrates the process taken to address these questions in this thesis.
Figure 3. Research outline.
3. METHODS

A design thinking workshop was organized to collect primary data for this thesis. It took place on February 28th, 2018 at Carleton University over 2.5 hours, with a total of 9 participants separated into 2 groups to collaboratively address a policy challenge. The rationale and details of this event are outlined in the following sections.

To address the research questions, feedback from individuals with experience in public policy was important. While there are many examples of design thinking initiatives occurring in the public sector as presented in section 2.4, it is not clear how these methods have been perceived and interpreted for effective use by the people who use them in much of the academic literature reviewed on the subject. In addition to participants assessing design thinking’s applicability to policy development, the concept of incorporating professional multidisciplinary designers into a design thinking policy challenge with policy experts was explored. Reasons for doing so were to:

1) assess whether having a designer present in a group with public sector experts could improve the effectiveness of design thinking methods being used.

2) gauge how open public servants are to working with designers when problem solving in policy challenges.

3) understand how open designers are to collaborating with public servants in problem solving challenges in government.
As discussed, design thinking in practice and perception can vary among individuals and organizations. For consistency, the aim was to provide participants with a similar experience of design thinking so they could respond to questions from first-hand participation. To facilitate this, the design research method of a design workshop was used to collect primary data. The following sections outline the rationale and design of the research methods employed.

3.1 Design Workshop
The central method used to facilitate primary research in this study was a design workshop. One of the advantages of a design workshop is the flexibility it allows for customization. It provides an opportunity to create an engaging and dynamic experience for participants. The researcher can utilise multiple research methods to gather data from multiple sources in a condensed period of time. The nature of a design workshop also lends itself as a good vehicle to present and experiment with design thinking methods in a group setting (Hanington & Martin, 2012, p. 62). Design workshops often consist of a group of people, between 5-20, and are then divided into smaller groups to develop design solutions (Curedale, 2013b, p. 101). This framework for problem solving can help explore concepts, frame insights, identify opportunities and improve decision making (p. 101).

Participant Eligibility and Recruitment
Recruitment for the design workshop included invitation by email, paper posters at Carleton University, electronic posters on social media and third party recruitment by the School of Public Policy and Administration and a professional contact from the public service. Participants were selected based on the following criteria (see Appendix B for recruitment poster):
• Someone who has experience working with public policy
• An experienced designer who has worked in a multidisciplinary environment and holds a design degree or diploma from a post-secondary institution
• An educator in the School of Public Policy and Administration
• A current graduate student and / or graduate of the School of Public Policy and Administration, and
• Must be 19 years of age or older

3.2 Policy Challenge

For participants to be able to practice design thinking, the workshop needed a policy challenge to work through. In 2016, the Canadian federal government’s Department of Environment and Climate Change presented a 3-year strategy for action on 13 new aspirational goals for an environmentally sustainable Canada. The strategy is called ‘Achieving a Sustainable future: a federal sustainable development strategy for Canada 2016-2019’ (FSDS)(Government of Canada, 2016a). One of the priorities outlined in the FSDS is to improve the accessibility of healthy food in Northern Canada as part of the ‘sustainable food’ goal (p. 61). This priority was used as the policy challenge in the workshop. To add focus to the policy challenge, the geographical area was limited to the 4 Inuit regions of Canada (also known as Inuit Nunangat): Inuvialuit, Nunavut, Nunavik and Nunatsiavut (Inuit Tapiriit Kanatami, 2018c).

The topic of food accessibility was chosen for a few reasons. The first was because the workshop policy challenge needed to be relatable at a general level versus a highly-specialized topic because participants would come from a range of backgrounds. The second is that the issue of
distance related to distribution is a factor that adds to the complexity of the policy challenge. The third reason is that sustainability and associated factors pose important and timely challenges to the public sector, creating complex problems (Government of Canada, 2016a; 2017e). It may be harder to achieve desired results with traditional policy making approaches alone when attempting to address these complex issues. Additionally, as many indigenous peoples reside in Inuit Nunangat (Inuit Tapiriit Kanatami, 2018d), traditional foods, knowledge and local action including territorial and community initiatives needed to be addressed in the workshop. To include local perspectives on food security challenges in Inuit Nunangat, initiatives were presented based on a review of information gathered from Inuit organizations. Some of the initiatives include (see Appendix H for full summary of contextual factors and local initiatives):

- Food banks for traditional and store bought food (Inuit Tapiriit Kanatami, 2017).
- Country foods program (Nisichawayasihk Trust Office, 2015).

### 3.3 Design methods used to organise the workshop

Because this workshop was produced from a design perspective, design methods were used to create the workshop. The following design methods were chosen to help communicate a complex policy challenge to individuals from different backgrounds in a short period of time, as well as, to encourage lateral thinking within a traditionally linear process.

**Design toolkit**: a design toolkit was created to help facilitate non-linear thinking. The toolkit included a map of Inuit Nunangat, contextual factor cards, a tip sheet, a simple instruction sheet
and art media supplies (see Appendices G, H, I, J and K for a full list of materials and toolkit visuals). Design and creative toolkits are a collection of modular objects that can used for prototyping and inspiring design teams (Curedale, 2013b, p.101).

**Visualization:** the use of visualisation in the design of this workshop was facilitated through the toolkit map and contextual factor cards, and later by the participants through the three design thinking methods used, outlined in section 3.4. Visualization is the process of transforming information into visual images (Liedtka & Ogilvie, 2011, p. 49). It can help clarify ideas and eliminate questions in one glance (p. 49). The map of Inuit Nunangat included major Canadian highways, the 4 regions of Inuit Nunangat, artic shipping routes and Inuit communities serviced by Nutrition North Canada, a food subsidy program funded by the federal government (Government of Canada, 2017i) (see Appendix G). As another form of visualization, simple illustrated icons on the context cards were used instead of plain text to provide participants with immediate imagery with the aim of helping to trigger new thoughts (Appendix H).

**Closed card sorting:** the contextual factor cards were separated into 7 groupings:

1. Economic factors
2. Distribution factors
3. Community initiatives
4. Federal initiatives
5. Territorial initiatives
6. Environmental factors
7. Blank cards
The aim of the contextual factor cards was to give participants tools for inspiring and generating ideas through visual thinking. They were encouraged to add missing factors not represented on the existing cards with icons to the blank cards and then re-arrange the cards into different groups and write on them, as stated on the tip card (Appendix J). Closed card sorting is a design method that falls under the umbrella of visualization. It can help participants understand relationships between various data or categories (Curedale, 2013a, p. 122).

3.4 Design Thinking methods used by participants in the workshop

After the workshop was designed, design thinking methods identified in the literature review needed to be incorporated into the policy challenge so participants could evaluate the methods. The three design thinking methods below were chosen for this workshop because, given the time constraints of the study, sketching, mind mapping and low-fidelity prototyping are relatively simple to understand and do not require extensive training for the new users. These methods were deemed suitable to approach the policy challenge of food insecurity in Inuit Nunangant because of the complex and multidimensional nature of the problem. To help participants organize information provided to them at the workshop, mind-mapping was chosen as a tool to help organize themes and categories. Sketching was to chosen further organize information and translate ideas from the group. Low-fidelity prototyping was chosen because of the quick nature of the method, which made it applicable to the short time frame provided in the workshop. To demonstrate how to use these 3 methods, photographs of examples were presented along with brief descriptions of each method during the presentation portion of the workshop (see Appendix N for presentation slides).
**Design thinking method 1: sketching**

It is a form of prototyping, visually recording ideas and can help explore concepts (Curedale, 2013a, p. 302). Sketching can translate ideas into concrete, easier to understand information and can quickly communicate information (Kumar, 2013, p. 237). Sketching is an important part of the design and design thinking process (Cross, 2011, p.12).

**Design thinking method 2: mind-mapping**

A visual presentation of a problem, theme or issue with connecting sub themes being drawn out from the central theme on paper using pens, pencils, markers, crayons. Words and drawings can be incorporated into the mind map. This is a helpful way to creatively organize and generate thoughts around a specific topic. It is a visual thinking tool to help idea generation, represent connections and analyze information (Curdale, 2013a, p.76), (Hanington & Martin, 2012, pp. 118-119).

**Design thinking method 3: low-fidelity prototyping**

This is a design method which can help bring clarity to abstract ideas, can help identify design problems, be used as a tool for generating insight from stakeholders and is inexpensive and quick to produce (Curedale, 2013a, p. 342). This simple form of prototyping is another common design thinking method that is widely used in the design process (Brown, 2008; Curedale, 2013; Hanington & Martin, 2012; Kumar, 2013; Liedtka & Ogilvie, 2011).
3.5 Research Procedure

The approach to conduct the research is as follows (see figure 4 for a visual representation of the workshop steps):

- Participants with expertise in design and the public sector were invited to participate in an interdisciplinary design thinking workshop. Potential participants were sent an invitation poster (Appendix B) via email, and provided preliminary confirmation of their attendance via email and in person.
- Upon arrival at the workshop, participants were given agendas of the workshop (Appendix P) and signed consent forms (Appendix C).
- Questionnaire #1 was completed (Appendix D).
- A PowerPoint presentation outlining design thinking and the policy challenge context was presented to the participants by the lead researcher (Appendix N).
- Participants were separated into two groups to address the policy challenge using design thinking methods and observations of this process were conducted.
- Participants presented their ideas from the policy challenge session and a semi structured group interview was facilitated.
- Questionnaire #2 was completed (Appendix E).

See Appendix O for a detailed timeline of the workshop.
**Design Thinking Workshop Steps**

1. **Step 1:** Identify and invite interdisciplinary participants
   - Design experts
   - Public sector experts

2. **Step 2:** Consent forms

3. **Step 3:** Use questionnaire to gather information about participants' experience with creative processes / design thinking

4. **Step 4:** Design thinking and policy challenge presentation

5. **Step 5:** Policy challenge session

6. **Step 6:** Group presentation and discussion

7. **Step 7:** Participants provide feedback on experience from workshop

**Participant Roles:**
- Lead researcher
- Design expert
- Public sector expert
- Moderator

**Legend:**
- Green: Lead researcher
- Blue: Design expert
- Red: Public Sector expert
- Black: Moderator

*Figure 4.* Design thinking workshop steps.
3.6 Data Collection Methods

**Questionnaires:** two questionnaires were used in the study (Appendices D & E). The first questionnaire used multiple choice questions to assess participants’ understanding of what they believed to be creative methods, if they have ever used creative and design thinking methods in their work before and if they were familiar with the Federal Sustainable Development Strategy prior to the workshop. The second questionnaire was a combination of multiple choice and open ended questions to gain an understanding of participants’ opinions about design thinking and working with designers after the design challenge. Both questionnaires were appropriate research tools because they were able to provide participants’ perceptions and thoughts about the workshop and context in written form (Hanington & Martin, 2012, p.140).

**Observations:** observations of the workshop events were conducted. These included written notes, audio-visual recordings of the design thinking session and photographs of each group’s output materials. Observations are an important part of design research and can provide evidence of events and outcomes (Kumar, 2013, p. 107).

**Group interview / focus group:** the group interview occurred after the design thinking session and participants were presented with 3 discussion questions (Appendix Q) which was audio-video recorded and transcribed. This provided qualitative data. This research method can help generate important insights from participants (Hanington & Martin, 2012, p. 92).
3.7 Data sorting approach

Collected data was sorted to identify key insights to address the research questions. After transcribing the audio recordings and consolidating answers from the questionnaires, typed text of all data was printed out and organized onto a wall for sorting (see figure 5). The ‘Observations to Insights’ framing technique was used at this stage (Kumar, 2013, p. 139). The ‘Insights Sorting’ technique (p. 141) was then used to identify key answers and statements from participants from the group discussion and idea presentation data (see figures 6, 7, 8, 9). Finally, two ‘User Response Analysis’ charts (p.145) were created for the two questionnaires to sort and code insights (Appendices L & M). Insights were further categorized into individual visual summaries for each set of data and organized to summarize themes that emerged (see figures 11, 18, 19, 20, 21).
Figure 6. Insights sorting, red group.

Figure 7. Insights sorting, blue group.

Figure 8. Individual insights sorting A.

Figure 9. Individual insights sorting B.
4. DATA COLLECTION AND ANALYSIS

4.1 Workshop Summary

The workshop took place at the School of Industrial Design at Carleton University in Ottawa, Ontario. It was scheduled for a 3 hour period but took 2.5 hours to complete. A total of 9 participants attended the workshop: 1 lead researcher (Renée Isaac-Saper), 2 thesis supervisors (Heather Dorries and Stephen Field) who acted as group moderators and one assistant (Juan Saavedra) to help with set up and documentation. See participant breakdown in *figure 10*.

<table>
<thead>
<tr>
<th>Research Participants: Experts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PUBLIC SECTOR</strong></td>
</tr>
<tr>
<td>Manager: Policy and Program Development, federal government</td>
</tr>
<tr>
<td>Policy Analyst / Advisor, federal government</td>
</tr>
<tr>
<td>Manager: Service, federal government</td>
</tr>
<tr>
<td>Director: Project Management, federal government</td>
</tr>
<tr>
<td>Policy Analyst, federal government, and graduate student in the School of Public Policy and Administration</td>
</tr>
<tr>
<td>Policy Expert, Specializes in non profit and municipal management</td>
</tr>
<tr>
<td><strong>DESIGN</strong></td>
</tr>
<tr>
<td>Industrial Designer</td>
</tr>
<tr>
<td>Industrial Designer</td>
</tr>
<tr>
<td>Industrial Designer and master of design student in the School of Industrial Design</td>
</tr>
</tbody>
</table>

*Figure 10. Workshop participants.*
Upon arrival, participants were asked to complete the consent form (Appendix C) followed by questionnaire #1 (Appendix D) which took 10 minutes. After completion of the forms, the lead researcher gave a 10 minute presentation about design thinking, the methods to be used in the workshop and an overview of the policy challenge and problem scenario (Appendix N). After a short break, participants were formed into 2 groups as determined by the lead researcher. The groups were separated into two rooms for the policy challenge (problem solving session) where design workstations were set up. At each workstation, participants were equipped with a design toolkit (Appendices G, H, J & K). Participants were then instructed to begin a 45 minute problem solving session to address the policy challenge by using any or all of the 3 design thinking methods presented (sketching, mind-mapping, low fidelity prototyping).

The policy challenge was: as a group, what can the Government of Canada do to improve the accessibility of healthy food in Northern Canada? (Appendix I). Each group had one moderator who was responsible for keeping the time and addressing participants’ questions. Both groups ended up taking an additional 5 minutes to consolidate their ideas. After the 50 minute problem solving session, participant representatives from both groups took a total of 12 minutes to present their final ideas to all workshop attendees. This was followed by a 14 minute group discussion to gain participants’ perspectives on their experience during the policy challenge. Participants then filled out the second questionnaire, were given a debriefing statement (Appendix F) and the workshop concluded.
4.2 Data Collection

There were 5 sets of data collected from the design thinking workshop:

1. Questionnaire #1 (with multiple choice questions)
2. Observations taken by the lead researcher and moderators on group interactions / outputs from the 50 minute group problem solving session (written notes, video and photographs).
3. Transcribed comments (from audio-video recordings) from both groups’ presentation of ideas generated in the problem solving session.
4. Transcribed comments (from audio-video recordings) from participants’ answers and discussion in the semi structured open interview.
5. Questionnaire #2 (with multiple choice questions).

The data collected from the study was qualitative, and in the following sections each of the 5 data collection sets have been summarized to reveal the most insightful answers to support the research questions. Combined, the written, verbal and observed data from the sample of 9 experts who participated in the workshop provide a relevant contribution to addressing the extent of how design thinking can be an appropriate and sustainable way to approach problems in the Canadian public sector.

4.3 Questionnaire #1

Purpose

The central aim of the first questionnaire was to assess participants’ general understanding and awareness of what they considered to be creative methods, and if they have used creative methods and design thinking in their work in the public sector prior to the workshop. This would
provide an understanding of participants’ initial levels of familiarity with the methods presented in the workshop.

**Results**

Abbreviations: PS= public servant, PE= policy expert.

*Question 3) Which methods below do you believe to be creative methods?*

<table>
<thead>
<tr>
<th>Method</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visualization</td>
<td>7</td>
</tr>
<tr>
<td>Sketching</td>
<td>7</td>
</tr>
<tr>
<td>Prototyping</td>
<td>8</td>
</tr>
<tr>
<td>Journey Mapping</td>
<td>6</td>
</tr>
<tr>
<td>Mind Mapping</td>
<td>7</td>
</tr>
<tr>
<td>Brain Storming</td>
<td>7</td>
</tr>
<tr>
<td>Concept Development</td>
<td>6</td>
</tr>
<tr>
<td>Co-creation</td>
<td>6</td>
</tr>
<tr>
<td>Observation</td>
<td>4</td>
</tr>
<tr>
<td>Scenarios</td>
<td>6</td>
</tr>
<tr>
<td>Framing</td>
<td>5</td>
</tr>
<tr>
<td>Experimentation</td>
<td>7</td>
</tr>
<tr>
<td>Other</td>
<td>story telling (1)</td>
</tr>
</tbody>
</table>

*Table 2. Responses to creative methods.*

*Question 4) If you have worked in the public service, have you used any of the above methods while working in the public service?*

<table>
<thead>
<tr>
<th>Answer</th>
<th>Totals</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>6</td>
<td>ALL PS / PE</td>
</tr>
<tr>
<td>No</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

*Table 3. Responses to using creative methods in the public service A.*
Question 5) If yes, which ones? Please list:

<table>
<thead>
<tr>
<th>Method</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visualization</td>
<td>2</td>
</tr>
<tr>
<td>Sketching</td>
<td>1</td>
</tr>
<tr>
<td>Prototyping</td>
<td>1</td>
</tr>
<tr>
<td>Journey Mapping</td>
<td>1</td>
</tr>
<tr>
<td>Mind Mapping</td>
<td>3</td>
</tr>
<tr>
<td>Brainstorming</td>
<td>6</td>
</tr>
<tr>
<td>Concept Development</td>
<td>1</td>
</tr>
<tr>
<td>Co-creation</td>
<td>1</td>
</tr>
<tr>
<td>Observation</td>
<td>2</td>
</tr>
<tr>
<td>Scenarios</td>
<td>3</td>
</tr>
<tr>
<td>Framing</td>
<td>0</td>
</tr>
<tr>
<td>Experimentation</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
</tr>
</tbody>
</table>

*Table 4.* Responses to using creative methods in the public service B.

Question 7) Are you aware of design thinking being used in the public service?

<table>
<thead>
<tr>
<th>Answer</th>
<th>Totals</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>2</td>
<td>ALL PS / PE</td>
</tr>
<tr>
<td>No</td>
<td>4</td>
<td>ALL PS / PE</td>
</tr>
</tbody>
</table>

*Table 5.* Responses to awareness of design thinking in the public sector.

Question 8) If yes, have you used design thinking while working in the public service?

<table>
<thead>
<tr>
<th>Answer</th>
<th>Totals</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>1</td>
<td>ALL PS / PE</td>
</tr>
<tr>
<td>No</td>
<td>5</td>
<td>ALL PS / PE</td>
</tr>
</tbody>
</table>

*Table 6.* Responses to use of design thinking in the public service.

**Analysis of Results**

Overall, participants had a good understanding of what they believed to be creative methods according to the results from question 3. In reference to question 5 (see table 4), out of all of the creative methods used by the participants in the public sector, respondents had used
brainstorming, and to a lesser extent, scenarios and mind mapping in the past. As shown in tables 5 and 6, some of the participants were not aware of design thinking being used in the public sector and few had used design thinking while working in government.

4.4 Observations

Purpose:
Observations of the policy challenge session were conducted by the lead researcher and moderators to gain insight into the group dynamics and observe which design thinking methods were used and how. The groups were labelled ‘blue group’ and ‘red group’ for organizational purposes.

Results: observations from red group
Initially, the group members spent some time talking about problem scenario, and only the designer was participating in any visual processes, mostly drawing linkages between the group’s discussion points. The context cards were moved around and looked at but were not used in ideation generation. The group’s moderator encouraged the participants to use the map and draw on it as they initially seemed hesitant to do so, perhaps because of its formal presentation. Once they started drawing on the map, it became the major tool for discussion. Baughn, et al. (2014) and Cross (2011) emphasise that sketching can help communicate ideas. This was then observed during the red group’s session. As the designer presented ideas from the discussion in visual formats (sketches), more ideas were generated. It took the other participants in the group a long time into the session to begin to feel comfortable sketching on the map.
Results: observations from blue group

Shortly after the beginning of the session and after introductions to one another, the group members quickly began to question what the big problems were and decided to organize the information they already had into groupings. They mounted these groupings onto push pin boards that were coating the walls of the room they were in. They then organized the contextual factor cards into groupings under “constraints” and “initiatives” on the wall and pinned up the large map supplied to them. Closed card sorting can help individuals understand relationships between categories (Curedale, 2013a, p. 122). The value of this process was observed as the blue group worked with the contextual factor cards. As they looked at the visual aids (cards and map), they began to discuss what types of technologies might be available and where else food could come from. One of the designers suggested looking towards Russia, Europe and Asia as possible routes for food and began to trace over the original map with a large sheet of blank paper. The designer’s decision to trace over the map instead of drawing on it, and look towards surrounding northern countries was a good example of abductive thinking, meaning that experienced designers can use their unique style of working and intuition to produce novel results (Cross, 2011). The result was that it allowed the group to create a new map to customize to their ideas. As the discussions and ideas formed, the same designer became the central communicator by visualizing the group’s ideas with sketches, words and a rough graph of potential trends. One of the public sector participants drew a mind map and stated that they were comfortable with this method, and another public service participant wrote out related ideas, factors and steps they would need to take to achieve their goals on large paper with markers. The group did not use prototyping in the problem solving session.
Red Group

Insights from Observations

• Designer was first participant to use visual processes.
• Designer used drawing to link ideas.
• Context cards were looked at, but not used in formal ideation session.
• Once the designer began to draw on the map, it became major discussion tool.
• More ideas were generated once more sketches were created.
• Non design participants took a long time to feel comfortable drawing.
• No prototyping occurred.

Design Methods Used

Sketching
Mind Map

Themes

• Designers in both groups facilitated the use of drawing / sketching.
• Public sector participants contributed through discussion, lists, providing insights from previous experience.
• Designers in both groups became the central communicators by graphically visualizing group member’s comments and ideas.
• Discussion in both groups was generated by looking at the map and drawing / writing on the map.

Blue Group

Insights from Observations

• The group members used the contextual factor cards to create their own groupings.
• Pinned up context cards and large map onto push pin boards on the wall to expand their work surface.
• Designer identified alternative transportation routes by looking at the map.
• Designer began to translate the groups verbal and written ideas to a new map, traced over the original map.
• One public sector participant drew a mind map.
• Another public sector participant drew lists of relevant information.
• Designer continued to combine ideas generated by the other group members into a informative map.
• No prototyping occurred.

Design Methods Used

Sketching
Mind Map

Figure 11. Observations summary.
4.5 Group Ideas from the Policy Challenge

Purpose:

After the policy challenge session was completed, representatives from each group were encouraged to give an overview to the workshop attendees of their ideas and potential solutions to the policy challenge. This would help provide a clearer understanding of how the group worked together to develop ideas and insight into whether using the design thinking methods influenced their outcomes.

Results: blue group solution ideas - key points from presentation

The blue group consisted of 2 designers, 1 policy expert, 2 public servants and moderator: co-supervisor and Assistant Professor Heather Dorries.

One of the designers in the blue group presented their group’s solution options to the workshop problem statement. The designer stated that their group used the contextual factor cards to identify the main issues surrounding the problem. The designer mentioned that as a group, they experienced some frustration about understanding the full details of the problem but eventually moved on to discuss the possibility of creating distribution and production hubs in Northern Canada. See figures 12, 13 and 14 for images of the blue group’s outputs from the workshop. One of the public servants from the blue group also added to the summary by stating that another aspect of their idea could be trading “know how” or knowledge to different markets and that their hub idea could be a “two way street” (things coming in and going out). See figure 18 for a visualization of blue group’s comments and ideas for addressing the problem statement.
Results: red group solution ideas - key points from presentation

The red group consisted of 1 designer, 3 public servants and moderator: supervisor and Assistant Professor Stephen Field. One of the public servant participants from the red group began the idea summary presentation on behalf of their group. They began by talking about the fact that none of their group members had firsthand knowledge of the problem issue or the northern context. They eventually reached the topic of communication challenges and they looked at how this connected
to food production and food importation. The red group focused on transportation and communication challenges, and as a result they considered how cellular / web networks and physical transportation played a role. The designer from the red group continued the idea presentation by presenting the idea of creating a “Northern Food Collective”, along with possible ideas of using a northern Uber system and drones for food delivery. See figure 18 for visualization of the red group’s comments and ideas.

Figure 15. Red group’s mind map.

Figure 16. Red group’s ideation.

Figure 17. Red group’s sketches.
Group Workshop Ideas – Key Points From Their Presentation

Blue Group

Participants

Designer  Designer  Public Servant  Public Servant  Policy Expert

Designer’s Summary / Key Points

• Used context cards to identify the main issues
• Frustration understanding the problem
• Hub areas
• Growing in controlled environments
• Natural energy
• Egg tech
• Outbound redistribution / distribution
• Need to talk to local residents
• Look to north, Europe, Asia, not to south
• Create new markets with over production
• What do the residents want to eat?
• What is nutritious food?
• Economy type?
• Holistic system
• Local dollar recirculation
• You get out what you put in
• Build outwards in smart way
• System must be nurtured and grown
• Small steps for sustainability

Public Servant’s Summary / Key Points

• Two way street
• Trade know how
• The group was able to plan for sequencing because of a planner in their group

Central Ideas to Address Food Insecurity

Production and Distribution Hubs
Create New Markets
Trade Knowledge

Themes

Alternative forms of transportation
Use of natural energy
Sustainability as a process
Where is food coming from, where else can food come from?
What does ‘Nutritious Food’ mean
Communication and knowledge exchange

Central Ideas to Address Food Insecurity

Northern Food Collective
Northern Uber
Improved Communication Networks Between Communities

Crossover Points

Difficulty understanding the problem
Don’t understand the true needs of residents and what they want
Need first hand experience
Food travel channels

Red Group

Participants

Designer  Public Servant  Public Servant  Public Servant

Designer’s Summary / Key Points

• Don’t know true needs of the residents
• The workshop session laid the groundwork for a deeper dive
• Next step would be to travel to the north
• Don’t know what food scarcity means
• Community food assessment term
• Inventory of food available in the north
• What do people want to eat?
• Who gets the food subsidies?
• Where is the food imported from?
• Snowmobile Uber
• Traditional food patterns?
• Inter community communication?
• Radio towers
• Blimps
• Drones
• Northern Food Collective
• Website to show inventory in communities

Public Servant’s Summary / Key Points

• Transportation challenges
• Communication challenges
• No firsthand knowledge of issue / northern context
• Superimposed communication issues onto food production / import
• Landing strips
• Skidoos
• Cellular / web networks

Central Ideas to Address Food Insecurity

Northern Food Collective
Northern Uber
Improved Communication Networks Between Communities

Figure 18. Group workshop ideas.
4.6 Group Discussion

Purpose:

Participants were asked to partake in a group discussion about their experience from the workshop. They were provided with the following 3 discussion questions to use as prompts to make any comments.

1. How was your overall experience with this exercise?
2. Did you find using the design thinking methods of mind-mapping, sketching and prototyping difficult?
3. How were you able or not able to contribute your expertise and knowledge to the group exercise?

Any other comments / open discussion.

Results (summarized responses):

Participant 1, Public Servant

They were not initially comfortable using the visual tools and are not used to visualizing their thoughts. They said that it took them some time to start using the visual tools presented in the workshop.

Participant 2, Public Servant

They said that the design methods used in this workshop provided a foundation which they could continue and that there was balance in the workshop. They liked that there were no rigid guidelines in the workshop as this can sometimes cause additional and unnecessary problems in government, based on their experience. They stated that the interdisciplinary aspect of the
workshop led to success in their group. In terms of the methods used in the workshop, they spoke about the mind map saying that the mind map provided a visual check and allowed the group to cross reference ideas. They concluded that they believe, from their perspective, policy making still needs to be a linear process but that the design methods used in the workshop could be useful in the front end of policy making.

*Participant 3, Public Servant*

Participant 3 stated that there is comfort in familiar tools and methods that you are used to impacts the outcomes of using certain methods. Participant 3 also noted that Post-It notes were missing at their workstation, and it was acknowledged throughout the group that participant 3 and some of the other government participants and designer participants were comfortable with using Post-It notes.

*Participant 4, Public Servant*

They noted that the designer in their group brought lateral thinking which was useful and they thought that the visual methods used in this workshop have potential to bring velocity to decision making in government. They stated that visual methods can give government new ways of presenting information which can be useful in today’s context, as problems in the public sector are popping up faster than before. They said that visual aspects of the workshop can facilitate a holistic approach to the problem.
Participant 5, Designer

Participant 5 asked the question, how do you get enough important information into a group before they meet to problem solve? They noted that the issues in the workshop are big, it is a difficult problem to work on, but that the way in which the workshop was organized was good in that it did get some helpful information into the groups in a short period of time.

Participant 6, Designer

Participant 6 stated that they noticed there was no hierarchy among participants at the workshop so it worked well because everyone was on the same level as they were relatively strangers to one another and that the workshop was co-operative. They also mentioned that different backgrounds enriched the discussions and moved things forward.
Group Discussion - Key Insights

• Not used to visualizing ideas.
• Initially not comfortable using the visual methods.
• Took time to use tools.
• Design methods provided foundation.
• No rigid guidelines allowed group flexibility.
• Interdisciplinary aspect was beneficial in their group.
• Mind map acted as a tool to cross reference ideas.
• Policy making process should remain linear, design methods in workshop could help in front end of policy making.
• Comfort in familiar tools and methods.
• Using methods you are used to can impact outcomes.
• Noticed Post-It notes missing at workstation.
• Some of the other participants are comfortable using Post It notes.
• Designer in group brought lateral thinking.
• Visual methods could bring velocity to decision making in government.
• Visual aspects of workshop created holistic approach to the problem.
• The workshop design helped to inform participants of a complex issue.
• Issues presented in workshop still big and difficult to approach despite information provided at the workshop.
• Different backgrounds of participants enriched discussions.

Themes
• Interdisciplinary aspect was beneficial
• Comfort in methods you know
• Uncomfortable with methods you don’t know
• Lateral thinking with help of designer
• Velocity to decision making
• Methods allowed for flexibility

Figure 19. Key insights from group discussion.
Analysis of Results:

Collectively, the group of 6 participants who spoke during the group discussion answered the 3 discussion questions as follows:

How was your overall experience with this exercise?

Group themes: generally, the experience was a positive one. Some of the public servants thought using the methods and having the designer present was helpful in presenting the information in different ways, quickly and effectively.

Did you find using the design thinking methods of mind-mapping, sketching and prototyping difficult?

Group themes: some of the public servants noticed that the designers were comfortable with the methods they were asked to use as a group, and stressed that comfort level with processes impacts outcomes. If one is comfortable with a tool, one is more likely to make better use of said tool which can lead to positive outcomes. If one is not comfortable with a tool, it can be harder to produce desired outcomes.

How were you able or not able to contribute your expertise and knowledge to the group exercise?

Group themes: in the dialogue, the interdisciplinary aspect of the workshop was brought up by some of the participants as being very beneficial for idea generation. Participants were able to work well together by combining design and public sector experience.
4.7 Questionnaire #2

Purpose:

The second questionnaire was the final point of data collection. It allowed participants to provide their perspectives on the events of the design thinking workshop in written format. Results from the questionnaire provided the opportunity to gauge participants’ interest in working with designers and design thinking methods in the public sector including policy development. Participants were also able to provide their opinions on how effective the design thinking methods presented in the workshop could be when applied to a public policy context.

Results:

Abbreviations: B= barriers, BDT= benefits of design thinking methods, BD= benefits of working with a designer, PS= public servant, PE= policy expert, DES= designer.

*Question 1) Do you think the combined design methods used in this exercise helped to generate new ways of viewing / approaching the problem?*

<table>
<thead>
<tr>
<th>Answer</th>
<th>Total</th>
<th>Participant Breakdown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Disagree</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Neutral</td>
<td>2</td>
<td>2 x PS</td>
</tr>
<tr>
<td>Agree</td>
<td>6</td>
<td>2 x PS</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>1</td>
<td>1 x PS</td>
</tr>
</tbody>
</table>

*Table 7. Responses about combined design methods used in the workshop.*

Written Comments

One PS wrote that visualizing ideas helped spur further discussion and draw further connections

Another PS wrote that the methods encouraged more ideas which led to lateral thinking, making the process more holistic.

The PE wrote that they think the techniques have the capacity to enhance group decision making by generating healthy conflict.

Another PS wrote that they needed a bit more time to become familiar with the tools and integrate them into their own analytical process.

<table>
<thead>
<tr>
<th>Written Comments</th>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>One PS wrote that visualizing ideas helped spur further discussion and draw further connections</td>
<td>BDT: Visualization = Connections + discussion</td>
</tr>
<tr>
<td>Another PS wrote that the methods encouraged more ideas which led to lateral thinking, making the process more holistic.</td>
<td>BDT: more ideas / Lateral thinking / Holistic process</td>
</tr>
<tr>
<td>The PE wrote that they think the techniques have the capacity to enhance group decision making by generating healthy conflict.</td>
<td>BDT: Healthy conflict, Better decisions</td>
</tr>
<tr>
<td>Another PS wrote that they needed a bit more time to become familiar with the tools and integrate them into their own analytical process.</td>
<td>B: More time to learn tools</td>
</tr>
</tbody>
</table>

*Table 8. Written comments about design methods used in the workshop.*

**Question 2) Do you think the use of mind mapping in this exercise helped to generate new ways of viewing / approaching the problem?**

<table>
<thead>
<tr>
<th>Answer</th>
<th>Total</th>
<th>Participant Breakdown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other</td>
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<td></td>
</tr>
<tr>
<td>N/A</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Disagree</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Neutral</td>
<td>2</td>
<td>2 x PS</td>
</tr>
<tr>
<td>Agree</td>
<td>7</td>
<td>3 x PS</td>
</tr>
<tr>
<td>Strongly agree</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Table 9. Responses about mind mapping in the workshop.*
Question 3) Do you think the use of prototyping in this exercise helped to generate new ways of viewing/approaching the problem?

<table>
<thead>
<tr>
<th>Answer</th>
<th>Total</th>
<th>Participant Breakdown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other</td>
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<td></td>
</tr>
<tr>
<td>N/A</td>
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<td>2 x PS</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>3</td>
<td>2 X DES</td>
</tr>
<tr>
<td>Disagree</td>
<td>1</td>
<td>1 X DES</td>
</tr>
<tr>
<td>Neutral</td>
<td>3</td>
<td>3 x PS</td>
</tr>
<tr>
<td>Agree</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Strongly agree</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

*Table 10. Responses about prototyping in the workshop.*

Question 4) Do you think the use of sketching in this exercise helped to generate new ways of viewing/approaching the problem?

<table>
<thead>
<tr>
<th>Answer</th>
<th>Total</th>
<th>Participant Breakdown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>0</td>
<td>1 x PS</td>
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<tr>
<td>Strongly disagree</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Disagree</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Neutral</td>
<td>1</td>
<td>1 x PE</td>
</tr>
<tr>
<td>Agree</td>
<td>5</td>
<td>2 x PS</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>2</td>
<td>2 x PS</td>
</tr>
</tbody>
</table>

*Table 11. Responses about sketching in the workshop.*

**Written Comments**

<table>
<thead>
<tr>
<th>Written Comments</th>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>One PS wrote that the use of sketching in this exercise was very beneficial and</td>
<td>BDT: Sketches=foundation</td>
</tr>
<tr>
<td>created a basis for thoughts to be generated.</td>
<td></td>
</tr>
<tr>
<td>Another PS wrote that the visuals seemed to have engaged the other part of their</td>
<td>BDT: Visuals=engaged brain</td>
</tr>
<tr>
<td>brain.</td>
<td></td>
</tr>
<tr>
<td>A third PS wrote that it helped generate ideas and draw connections.</td>
<td>BDT: Idea generation/connections</td>
</tr>
</tbody>
</table>

*Table 12. Written comments about sketching in the workshop.*
Question 5) Do you think the visual representation of the food accessibility in Northern Canada issue in this exercise helped to generate new ways of viewing / approaching the problem? (Toolkit including the map of Canada, contextual factor cards)

<table>
<thead>
<tr>
<th>Answer</th>
<th>Total</th>
<th>Participant Breakdown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other</td>
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<tr>
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<td>Strongly disagree</td>
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<tr>
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<tr>
<td>Agree</td>
<td>4</td>
<td>1 x PS</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>5</td>
<td>4 x PS</td>
</tr>
</tbody>
</table>

*Table 13. Responses about the visual representation of the policy challenge in the workshop.*

**Written Comments**

- One PS wrote that the visual representation helped anchor discussions. The map and context cards helped them to consider solutions and visualize them. It also helped them understand the scale of the issue (the massive spaces and distances).

- Another PS wrote that it provided a foundation from which to build upon.

- Another PS wrote that it helped frame the issues.

- A fourth PS commented that it was only once their group started drawing on the map that they began to focus on the networks and spatial relationships.

*Table 14. Written responses about the visual representation of the policy challenge in the workshop.*

**Themes**

- BDT: Anchor discussion/ Tools helped visualize solutions
- BDT: Foundation
- BDT: Frame issues
- BDT: Map and drawing helped focus
Question 6) Do you think the group interaction aspect of presenting the food accessibility in Northern Canada issue in this exercise helped to generate new ways of viewing/approaching the problem?

<table>
<thead>
<tr>
<th>Answer</th>
<th>Total</th>
<th>Participant Breakdown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other</td>
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<td></td>
</tr>
<tr>
<td>N/A</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>0</td>
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<tr>
<td>Disagree</td>
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<td></td>
</tr>
<tr>
<td>Neutral</td>
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<td>1 x PS</td>
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<tr>
<td>Agree</td>
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<td>1 x PS</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>7</td>
<td>3 x DES</td>
</tr>
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</table>

*Table 15. Responses about group interaction in the workshop.*

<table>
<thead>
<tr>
<th>Written Comments</th>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>One PS wrote yes, our different backgrounds provided us with unique thoughts and perspectives to work through our ideas.</td>
<td>BD: Benefited from interdisciplinary aspect</td>
</tr>
<tr>
<td>A second PS stated that the cross section of individuals with different backgrounds / experience certainly helped with generating thoughts and ideas.</td>
<td>BDT: Benefited from interdisciplinary aspect</td>
</tr>
<tr>
<td>A third PS wrote that the best part of the experience was the multidisciplinary approach. Everyone brought their own strengths / perspectives.</td>
<td>BDT: Benefited from interdisciplinary aspect</td>
</tr>
</tbody>
</table>

*Table 16. Written responses about the group interaction in the workshop.*
Question 7) If you have worked in the public sector, which of the following methods do you think could be helpful to approach problems in the public sector? Check all that apply.

<table>
<thead>
<tr>
<th>Method</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Mind Mapping</td>
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<tr>
<td>Prototyping</td>
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</tr>
<tr>
<td>Sketching</td>
<td>6</td>
</tr>
<tr>
<td>Visualization / visual representation</td>
<td>6</td>
</tr>
</tbody>
</table>

*Table 17. Responses about applicable design methods for use in the public sector.*

Question 8) If you selected any of the methods in question 7, realistically, how effective do you think they could be when used to approach problems in the public sector?

<table>
<thead>
<tr>
<th>Answer</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problematic</td>
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</tr>
<tr>
<td>Not effective</td>
<td>0</td>
</tr>
<tr>
<td>Effective</td>
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</tr>
<tr>
<td>Highly Effective</td>
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</table>

*Table 18. Responses about potentially effective design methods for use in the public sector.*

**Written Comments**

<table>
<thead>
<tr>
<th>Written Comments</th>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>One PS commented that they could be highly effective when used by a team and at the design and evaluation phases of public sector projects. Use of these methods, in their opinion can help bolster team participation and exposes others to new ideas.</td>
<td>BDT: Improved team participation</td>
</tr>
<tr>
<td>Another PS wrote that lots of experimentation and education would be required first.</td>
<td>B: Need education in methods</td>
</tr>
</tbody>
</table>

*Table 19. Written responses about potentially effective design methods for use in the public sector.*
Question 9) Did you find it helpful to have the designer in your group present when using the creative methods to approach the problem?

<table>
<thead>
<tr>
<th>Answer</th>
<th>Total</th>
<th>Participant Breakdown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other</td>
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<td></td>
</tr>
<tr>
<td>N/A</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Disagree</td>
<td>1</td>
<td>PS</td>
</tr>
<tr>
<td>Neutral</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>3</td>
<td>ALL PS/PE</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>2</td>
<td>ALL PS</td>
</tr>
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</table>

*Table 20. Responses about working with a designer.*

**Table 21. Written responses about working with a designer.**

<table>
<thead>
<tr>
<th>Written Comments</th>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>One PS wrote that it helped them to think about the problem more in depth and got them thinking about the visual methods.</td>
<td>BD: Considered using visual methods</td>
</tr>
<tr>
<td>Another PS wrote that the industrial designer in their group was very helpful in visually pulling the ideas and thoughts together.</td>
<td>BD: Brought ideas together</td>
</tr>
<tr>
<td>A third PS wrote that in their own work, they often draw charts to help them understand policy problems, but in this exercise, having a person with better developed visualization skills helped to pinpoint both root causes and potential solutions.</td>
<td>BD: Having expert in methods helped</td>
</tr>
</tbody>
</table>
Question 10) What did you like about working with a designer?

<table>
<thead>
<tr>
<th>Written Comments</th>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>One PS wrote that they are not used to using the design methods presented, so at first they were not ready utilize them. Once they saw the designer working with them, they felt more comfortable. They tend to talk through ideas but not always write them down in text or use visual tools.</td>
<td>B: Not used to using methods</td>
</tr>
<tr>
<td></td>
<td>B: Not initially comfortable</td>
</tr>
<tr>
<td>Another PS wrote that the designer’s different perspective and approach complimented their own experience and methodologies.</td>
<td>BD: Complimentary experience</td>
</tr>
<tr>
<td>A third PS wrote that they liked how the designer was able to facilitate succinctly and compactly, recording ideas and relationships between the ideas.</td>
<td>BD: Facilitation</td>
</tr>
<tr>
<td></td>
<td>BD: Recorded ideas</td>
</tr>
</tbody>
</table>

*Table 22. Written responses about positive aspects of working with a designer.*

Question 11) What did you not like?

<table>
<thead>
<tr>
<th>Written Comments</th>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS: Would have preferred more structure to group session, let each person speak in full before picking a direction</td>
<td>B: More structure preferred</td>
</tr>
</tbody>
</table>

*Table 23. Written response about what was disliked in the workshop.*

Question 12) Do you think working with a designer when approaching problems in the public sector could be helpful? Why or why not?

<table>
<thead>
<tr>
<th>Answer</th>
<th>Total</th>
<th>Participant Breakdown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other</td>
<td>1</td>
<td>PS (provided a facilitator) to the group</td>
</tr>
<tr>
<td>N/A</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Strongly agree</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Disagree</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Neutral</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>2</td>
<td>ALL PS/PE</td>
</tr>
<tr>
<td>Strongly agree</td>
<td>3</td>
<td>ALL PS</td>
</tr>
</tbody>
</table>

*Table 24. Responses about working with a designer in the public sector.*
A PS wrote that working with the designer could push the boundaries of a big machine with set ways that are difficult to change (alluding to the public sector).

Another PS wrote that it could be very beneficial when communicating ideas in a way that resonates and would help to avoid jumping from problem to solution without the generate and test phases.

A third PS provided some valuable insights, writing that most people in policy jobs tend to be good with words. Dealing with pictures / visuals move people out of their comfort zone and may generate new perspectives / ideas / approaches.

<table>
<thead>
<tr>
<th>Written Comments</th>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>A PS wrote that working with the designer could push the boundaries of a big machine with set ways that are difficult to change (alluding to the public sector).</td>
<td>BD: Push boundaries</td>
</tr>
<tr>
<td>Another PS wrote that it could be very beneficial when communicating ideas in a way that resonates and would help to avoid jumping from problem to solution without the generate and test phases.</td>
<td>BD: Idea communication</td>
</tr>
<tr>
<td>A third PS provided some valuable insights, writing that most people in policy jobs tend to be good with words. Dealing with pictures / visuals move people out of their comfort zone and may generate new perspectives / ideas / approaches.</td>
<td>BDT: New perspectives Get out of comfort zone</td>
</tr>
</tbody>
</table>

*Table 25. Written responses about working with a designer in the public sector.*

Question 13) *For the designers only: did other participants ask you for help with design methods / any other comments*

<table>
<thead>
<tr>
<th>Written Comments</th>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>A DES wrote that group members didn’t ask them to sketch but were happy they were doing it and encouraged it.</td>
<td>Designer encouraged to draw</td>
</tr>
<tr>
<td>Another DES wrote that their group members asked them to visualize the ideas they had been writing, add certain colors or emphasis to areas of their combined drawing for further clarity and emphasis according to their concerns.</td>
<td>Designer encouraged to continue with visuals</td>
</tr>
</tbody>
</table>

*Table 26. Written comments from designers.*
Question 14) For all participants: what were the main insights you gained from this exercise?

<table>
<thead>
<tr>
<th>Written Comments</th>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>A PS wrote that they learned more about industrial design and its many uses. They were initially unsure of its applicability. Their past learning styles have excluded design methods but they will consider it in the future. They believe visual representations and team involvement in these design methods can be extremely useful to gain new insights and perspectives.</td>
<td>B: Unaware of design applicability</td>
</tr>
<tr>
<td></td>
<td>Methods can help gain new perspectives</td>
</tr>
<tr>
<td></td>
<td>BDT: Methods should not be rigid</td>
</tr>
<tr>
<td></td>
<td>B: Methods should not distract from goals</td>
</tr>
<tr>
<td>Another PS wrote that methodologies exist to aid but should not be the central focus. For problem solving to evolve, free flow of thought is necessary. However, having a designer to ‘translate visually’ and help pull points together was very beneficial.</td>
<td>BD: Visual translation</td>
</tr>
<tr>
<td></td>
<td>BD: Methods should not distract from goals</td>
</tr>
<tr>
<td>A DES wrote that actively generating an artifact (via one of the methods) can help bring the team together quickly (like the way people gather around a bonfire.</td>
<td>BDT: Creating visual object improves quick collaboration</td>
</tr>
</tbody>
</table>

Table 27. Written responses about main insights.

Analysis of Results:

Results from the second questionnaire through written comments and multiple choice questions demonstrated that the design methods used in the workshop and the visual representation of the issue’s context helped to view / approach the problem in new ways, except for prototyping.

Participants’ answers demonstrated that the interdisciplinary background of the workshop was beneficial by providing unique perspectives and helped with idea generation. Participants with experience working in the public sector indicated that, based on their experience at the
workshop, the methods used could be effective in actual application to problem solving in the public sector. Answers from the second questionnaire also revealed that most of the public sector experts found that having a designer in their group at the workshop was helpful. Additionally, the public sector respondents communicated that working with a designer in the context of the public sector could be helpful. Based on written responses from the public sector experts, some of the reasons to support these findings included that the designer’s experience complemented their own, they brought lateral thinking to the group, were helpful in pulling ideas together visually and that the designer acted as a facilitator to their group. The idea that working with a designer in the public sector could also help push the boundaries of the set-in ways of government was another insight that emerged from the written comments. See figures 20 and 21 for a summary of insights from the data collection and overlapping themes.
Insights from Data Collection

<table>
<thead>
<tr>
<th>Data sets</th>
<th>Questionnaire 1</th>
<th>Observations</th>
<th>Semi Structured Group Interview</th>
<th>Questionnaire 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Good understanding of CM</td>
<td>• Designers facilitated CM</td>
<td>• Interdisciplinary aspect was beneficial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Many creative methods not used in PS by PSP’s</td>
<td>• Designers as central communicators</td>
<td>• Comfort in methods you know</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Some PSP’s not aware of DT used in PS</td>
<td>• Interaction with maps generated discussion</td>
<td>• Uncomfortable with methods you don’t know</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Some PSP’s have not used DT in PS</td>
<td>• PSP’s contributed through discussion, lists, previous experience</td>
<td>• Lateral thinking with help of designer</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• PSP’s hesitant to draw</td>
<td>• Improves time use in decision making</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Methods allowed for flexibility</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Insight Legend

• Insights to inform barriers to use of design thinking in the public sector

• Insights to identify benefits of working with a designer in the public sector

★ Insights to identify benefits of design thinking use in the public sector

Figure 20. Insights from data collection.
### Crossover Themes from Data Collection

<table>
<thead>
<tr>
<th>Data sets</th>
<th>Questionnaire 1</th>
<th>Observations</th>
<th>Semi Structured Group Interview</th>
<th>Questionnaire 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Good understanding of CM</td>
<td>• Designers facilitated CM</td>
<td>• Interdisciplinary aspect was beneficial</td>
<td>* DM = new ways of viewing problem</td>
</tr>
<tr>
<td></td>
<td>• Many creative methods not used in PS by PSP’s</td>
<td>• Designers as central communicators</td>
<td>• Comfort in methods you know</td>
<td>* DM could help approach problems in PS</td>
</tr>
<tr>
<td></td>
<td>• Some PSP’s not aware of DT used in PS</td>
<td>• Interaction with maps generated discussion</td>
<td>• Uncomfortable with methods you don’t know</td>
<td>* DM could be effective in PS</td>
</tr>
<tr>
<td></td>
<td>• Some PSP’s have not used DT in PS</td>
<td>• PSP’s contributed through discussion, lists, previous experience</td>
<td>• Lateral thinking with help of designer</td>
<td>* Helpful having designer when using DM</td>
</tr>
<tr>
<td></td>
<td>• PSP’s hesitant to draw</td>
<td></td>
<td>• Improves time use in decision making</td>
<td>* Working with designers in PS could be helpful to approach problems</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Methods allowed for flexibility</td>
<td>* Visualization = discussions and connections</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>* DM = more ideas</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>* DM = lateral thinking</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>* DM = holistic process</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>* More time needed to learn tools</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>* DM = foundation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>* DM = anchor discussions</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>* DM = frame issues</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>* Interdisciplinary aspect beneficial</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>* Need education to use methods</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>* PS not comfortable using DM methods</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>* Designers as facilitators</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>* Methods should not distract from goal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>* Initially unsure of design’s applicability</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>* Designer encouraged to draw</td>
</tr>
</tbody>
</table>

**Insight Legend**
- • Insights to inform barriers to use of design thinking in the public sector
- ■ Insights to identify benefits of working with a designer in the public sector
- ★ Insights to identify benefits of design thinking use in the public sector

**Figure 21.** Crossover themes from data collection.
5. DISCUSSION

Insights from the data analysis can be broken down into three categories regarding policy development:

1. Benefits of using the design thinking methods presented.
2. Benefits of working with a designer in conjunction with the design thinking methods presented.
3. Barriers to the use and implementation of the design thinking methods presented.

5.1 Benefits

Benefits of using the design thinking methods presented. Insights from design and public sector experts:

- Could help to make better use of time spent during decision making in public sector contexts.
- New ways of viewing problems through sketching, mind mapping and the visual representation of the problem context.
- Helped to facilitate a process that was not bound by rigid guidelines and allowed participants to make their own decisions during the policy challenge session.
- Helped to inspire idea generation and lateral thinking.
- Helped to facilitate a holistic process to approaching the policy challenge.
- The visual representation of the problem context helped to focus discussions and frame issues.
- Visualization can lead to discussion and making connections.
- The design methods used could help approach problems in public sector.
• The design methods used could be effective in the public sector.

Benefits of designers being part of the group. Insights from public sector experts:

• The designers acted as central communicators in both groups.
• The designers helped facilitate the design methods.
• The designers brought lateral thinking to the groups.
• Having the designers present proved to be helpful when using the design methods.
• Public sector experts expressed that working with designers when approaching problems in the public sector could be helpful.

Significance of insights

Based on their experience at the workshop, public sector experts responded positively to the 3 design thinking methods introduced, and deemed them potentially applicable to policy development in the public sector. As outlined in section 2.2 in the literature review, approaches to policy challenges in the public sector are often linear in nature with little room for experimentation or alternative courses of action, largely due to barriers such as limited resources and incomplete contextual information (Favoreu et al., 2016; Forester, 1984). Insights from the workshop showed that design thinking has potential to facilitate a flexible process for decision makers within the parameters of the methods, can help inspire lateral thinking and provide the opportunity to view the problem context in a holistic manner. The visualization aspect of the workshop design and designers’ outputs proved to be a powerful tool in moving the discussions forward. As referenced in section 3.3, visualization can help clarify ideas and eliminate questions quickly (Liedtka & Ogilvie, 2011, p.49). Evidence of this was revealed through the use of the
design toolkit including the map of Inuit Nunangat and the contextual factor cards. Based on participants’ responses, the combined creative elements could help create space for creativity and non-linear thinking within the defined walls of the public sector, and potentially lead to improved decision making. Furthermore, based on the experience at the workshop, having an experienced designer present to facilitate these elements could help to improve the effectiveness of these methods in the long term.

In response to the main research question, to what extent is design thinking an appropriate and sustainable way to approach problems in the Canadian public sector?, the results from the data were positive. They revealed that the methods presented in the workshop could be effective when approaching problems in the public sector (see results from question 8, second questionnaire). The insights revealed that the public sector participants responded very positively to the way the information was visualized.

In terms of the workshop tools, the map of Inuit Nunangat seemed to be the main visual tool around which the participants focused. While one of the groups ended up using the contextual factor cards to create their own categories, the other group looked at the cards but did not directly engage with them. Once the designers both started to use the maps as a tool for making connections and drawing on / tracing over the map, new ideas and discussions formed.

While none of the participants had time to create any prototypes, both groups managed to create mind maps. As one public servant led the mind map initiative because they were comfortable using this method based on previous experience, the designer led the mind map creation in the
other group. Responses from one of the participants revealed that the mind map helped to act as a visual check and cross reference ideas. This response helps to validate the application of this method, and is further supported by literature which argues that mind mapping can help draw connections (Liedtka & Ogilvie, 2011).

Because of the popularity and proven effectiveness of design thinking as presented in the literature review, it was not surprising that the methods helped to produce new ideas and perspectives. However, having a collective response from experienced public servants that they believe the methods presented could be effective in the public sector was noteworthy as the government is not well known for using creative methods (Bellefontaine, 2012). One public servant did suggest, however, that they believe the policy making process should remain linear, but that the design methods used could be helpful at the front end of policy making. Another participant stated that they believed the methods used could be more effective for service delivery than policy development. So even though there was general consensus among the public sector experts at the workshop that design thinking approaches could be potentially effective in the public sector, there was some variance as to where and when the methods could be effective.

Because designers were present in both groups’ problem solving sessions, they made good use of sketching and were able to effectively visualize information which had positive results on the outcomes. Had the designers not been part of the groups, it is not known whether the public sector respondents would have agreed that the methods used could be effective.
The role of the designer in both groups was perhaps the most surprising finding from the workshop data. Based on the comments from the public sector experts in the questionnaires and observations of the policy challenge session, one designer from each group became the central communicator and facilitator. Because of their comfort and skill using drawing to represent information, they quickly gravitated towards taking charge of the visual process. As other group members contributed through discussion, written words with pens and markers, and one participant with a mind map, the designers translated the information. The concept of using sketching to translate information (Kumar, 2013, p.237) further supports the use of this method to improve communication. Through observations and as stated by one participant, it appeared as though many of the public sector participants were happy the designer was able to facilitate the visual process.

5.2 Barriers

Barriers to Design Thinking Implementation and Use in the Public Sector. Insights from public sector experts:

- Public servants had little previous experience using most of the creative methods, but were aware of them.
- Public servants were more hesitant to draw.
- Some public servants stated that there is comfort in methods you know.
- Needing more time with the creative tools was a consistent theme.
- Lack of education in design methods could be a potential barrier for future use.
- Some public servants were not comfortable using the methods at first.
• The notion that the methods should not distract from the goal emerged through written dialogue.

• A potential barrier was initially being unsure of design’s applicability.

In response to, what are the barriers and drawbacks aspect of the research questions presented in the introduction, there were some insightful comments in the results. One barrier to note was the lack of knowledge of design’s applicability to non-traditional design situations such as government (see answer in question 14, questionnaire #2). Another barrier that emerged from the results was the lack of confidence and discomfort felt by some of the participants who were not used to using the design methods presented in the workshop. This was evident from the dialogue in the group discussion, questionnaire #2 and general observations of the group dynamics.

Another pertinent comment by a public servant in response to question 8 in questionnaire #2 was that the methods used in the workshop could be a good way to approach public sector problems but that lots of experimentation and education would be required first. This statement is significant because it leads to questions such as, what kind of training are current public servants currently receiving for design thinking? Do they have enough time to attend the training and enough interest and motivation to apply the methods after their training? If public servants do not have enough resources to holistically learn design methods, could including an experienced designer in the team help mitigate this barrier? From the results of the study, participants agreed that working with a designer helped them make good use of the methods, and brought lateral thinking, new skills and new ideas to their group. Abductive reasoning and lateral thinking are important skills experienced designers have, and take time to develop as stated in
the literature (Cross, 2011). Experienced designers often practice lateral thinking (Considine, 2012; Martin, 2009) and this aspect alone could prove to be very beneficial to defining problems and generating solutions in government.

Lack of understanding of what design is, and how its methods can be applicable to the public sector is another barrier that surfaced from one of the public sector participants. As cited in the literature review, design thinking is at risk of not being taken seriously if it is not well understood (Mintrom & Luetjens, 2016). If it is not well understood by individuals who are instructed to utilize the methods, it could be difficult for the process to be sustainable. Having a designer present to educate and facilitate the methods could help mitigate this barrier.

Based on the results and analysis of the data, some barriers and benefits of using design thinking in the public sector have been identified. As referenced in the literature review by Mintrom and Luetjens (2016), for best results of design thinking practice, it should be implemented as a long-term process (Brown, 2015; Dorst, 2015; Martin, 2008; Mintrom & Luetjens, 2016). Based on the positive response from the public servants about working with designers in this workshop, incorporating design experts into teams within the public sector as part of a long-term strategy could help design thinking be successfully implemented. Doing so could help design thinking be holistically incorporated into the process of addressing challenges in policy development, which are constantly evolving and occurring more frequently, as stated by one of the participants. Including designers who are already highly skilled in lateral thinking and design methods to policy teams, instead of requiring that policy makers be trained in these methods and expected to lead when they may not be fully comfortable in doing so, could be beneficial to all stakeholders.
As reflected in the results of the workshop, the concept of interdisciplinary collaboration between design experts and policy experts in the public sector could allow both groups to complement the other’s experience for improved results in policy making.

5.3 Limitations

The design workshop in this research looked at small number of design thinking methods: sketching, prototyping, mind mapping and the use of a visual toolkit. As revealed in table 1 in the literature review, many more design thinking and creative methods are being implemented throughout the Canadian public sector. Because of the limited time frame of this research project, it was not possible to gauge public servants’ perspectives on some of the more time consuming methods such as co-creation, observation, testing, scenarios, user journey maps and empathy building. These aspects of design thinking in the public sector could be explored in future studies.

It was determined through observations and participant responses from the second questionnaire that prototyping was not used by any team members during the policy challenge session, however, several respondents indicated that they believe low-fidelity prototyping could be effective in policy development. One reason why this method was not used during the workshop was perhaps because of the limited time frame of the session (50 minutes). As was observed, participants spent significant time discussing the contextual factors surrounding the policy issue and began to come up with solution ideas towards the end of the session, which did not allow for enough time to prototype.
Because of the small sample number of participants in the study (9), for more definitive, concrete conclusions, it would be necessary to test the methods presented in the workshop with a larger sample size of public servants and experienced designers.

Lastly, recruitment of public servants for the workshop proved to be challenging. Recruitment posters on the Carleton campus and on social media did not produce results. In future research, a more focused recruitment strategy could be more effective.
6. CONCLUSION

The public sector is a large complex organization, full of constantly evolving and new challenges (Government of Canada, 2017e; 2018c). As reflected in the results of the 2 participant groups’ work in the 50 minute problem solving session to address food insecurity in Inuit Nunangat, attempting to frame and suggest solutions is challenging. With many intertwining variables such as economic, distribution, social, environmental and political factors (see Appendices H and N), using a linear method to approach the issue would appear difficult. The design thinking workshop used in this research project aimed to provide a non-linear approach by presenting some core design methods in the hopes of facilitating alternative solutions to address the current state of food insecurity in Northern Canada.

Insights from public sector and design experts helped to address the central research question: to what extent is design thinking an appropriate and sustainable way to approach problems in the Canadian public sector? Through the collection of data from questionnaires, observations and a group interview, some benefits of use and barriers to implementation of design thinking in the public sector were identified. After working with a designer and applying the design methods of sketching and mind mapping to approach the policy challenge, the public sector experts who attended the workshop responded by communicating that they believe design thinking could be effective if used in the public sector to varying degrees. Some of the limitations that were brought up included sufficient training and comfort level using the design methods. In the second questionnaire, public sector participants stated that working with a designer to approach problems in the public sector could be effective, and relayed potential benefits through verbal dialogue based on their experience at the workshop. These results led to the conclusion that,
based on responses from the small sample of design and public sector experts who participated in this study, design thinking in the Canadian public sector can be appropriate and sustainable if barriers are mitigated. A suggestion to mitigate some of the barriers that were highlighted in the research would be to include design experts in teams where design thinking occurs or could occur in government. As part of an interdisciplinary collaborative approach, designers could offer education, training, expertise as a resource, facilitation and translation of information to a policy development team or process (see figure 22). The ‘approach’ box in figure 23 illustrates how interdisciplinary collaboration with designers and public sector experts could occur. If designers were to work in the public sector to approach policy challenges, understanding the core processes and limitations of the complex government system could further benefit the collaborative approach. Details as to how this knowledge could be attained should be explored in future studies.
Summary of Insights from the Design Thinking Workshop

Public sector and design experts provided insight from their experience at the design thinking workshop. Findings from the results suggest that design thinking in the Canadian public sector can be appropriate and sustainable if barriers are mitigated.

Findings from the workshop

- Identified benefits of design thinking use
  - Can focus discussions and frame issues
  - Facilitation of idea generation and lateral thinking
  - Can improve how time is used in decision making
  - Presents new ways of viewing problems
  - Potential for facilitating holistic processes when approaching problems

- Identified barriers to implementation and design thinking use
  - Need education and training
  - Being unaware of design’s applicability to policy
  - Uncomfortable using new creative methods
  - Methods should not act as distractions

- Suggestion to mitigate barriers
  - Include design experts in teams where Design Thinking occurs in government

- Suggested contributions designers could provide to team members in government
  - Education
  - Training
  - Expertise as resource
  - Facilitation
  - Translation of information

Figure 22. Summary of insights from the design thinking workshop.
Recommendation Based on Findings: Interdisciplinary Collaborative Approach to Innovation in Policy Development

Figure 23. Recommended approach: interdisciplinary collaborative approach to innovation in policy development.

While the findings from the workshop and literature revealed potential for positive outcomes when applying design methods to public sector challenges, caution should be taken when considering how and when to apply this creative process in government. Implementing design thinking processes for longer term initiatives versus more immediate, high risk problems could be more appropriate, based on the argument that time, space and strong leadership is required for best results (Mintrom & Luetjens, 2016, p. 399).
Through a benchmarking study of government departments and units who are using or have used design thinking as a tool for innovation in the public sector, it was revealed that there are many initiatives that are using design methods but few public servants with design backgrounds. Until further studies can be conducted, results from the research presented in this thesis have led to many more questions and revealed exciting opportunities for the continued exploration into the combined worlds of design and policy development.
7. FUTURE RESEARCH

Next steps in this research would be to explore how designers work with policy experts in a true government setting on a policy challenge, which would include a larger participant pool. Research into exploring and evaluating design thinking in the public sector for targeted use in short and medium term projects, versus the holistic adoption of design thinking methods over a long period of time would also be beneficial to the field.

To build upon the questions raised in section 2.5 (i.e. the presence of designers), it would be useful to conduct an in-depth study of the presence and role of designers in the public sector across departments. There may be individuals who have design experience who work in the public sector but operate under a different title. Additionally, conducting research to identify the external organizations that have collaborated with the Government of Canada on advancing the innovation agenda to date and assessing the outcomes would be of value.

Reflecting on the 5 stages of policy making presented by Mintrom & Luetjens (2016) in section 2.2.2, findings from the workshop revealed that the design methods presented which were centered around visualization could be applicable to stage number 1: problem definition. Because many more design thinking methods exist but were not explored in this thesis, it would be of value to investigate how other design methods could be applied to stages 2 through 5 (agenda setting, policy adoption, program implementation and program evaluation) in future research.
8. REFERENCES


9. APPENDICES

Appendix A: Ethics Clearance

CERTIFICATION OF INSTITUTIONAL ETHICS CLEARANCE

The Carleton University Research Ethics Board-B (CUREB-B) has granted ethics clearance for the research project described below and research may now proceed. CUREB-B is constituted and operates in compliance with the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS2).

Ethics Protocol Clearance ID: Project # 108434

Research Team: Ms. Renee Isaac Saper (Primary Investigator)
Stephen Field (Research Supervisor)
Heather Dorries (Research Supervisor)

Project Title: Interdisciplinary Design Thinking Workshop [Renee Isaac-Saper]

Funding Source (If applicable):


Restrictions:

This certification is subject to the following conditions:

1. Clearance is granted only for the research and purposes described in the application.
2. Any modification to the approved research must be submitted to CUREB-B via a Change to Protocol Form. All changes must be cleared prior to the continuance of the research.
3. An Annual Status Report for the renewal of ethics clearance must be submitted and cleared by the renewal date listed above. Failure to submit the Annual Status Report will result in the closure of the file. If funding is associated, funds will be frozen.
4. A closure request must be sent to CUREB-B when the research is complete or terminated.
5. Should any participant suffer adversely from their participation in the project you are required to report the matter to CUREB-B.

Failure to conduct the research in accordance with the principles of the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans 2nd Edition and the Carleton University Policies and...
Procedures for the Ethical Conduct of Research may result in the suspension or termination of the research project.

Upon reasonable request, it is the policy of CUREB, for cleared protocols, to release the name of the PI, the title of the project, and the date of clearance and any renewal(s).

Please contact the Research Compliance Coordinators, at ethics@carleton.ca, if you have any questions or require a clearance certificate with a signature.

CLEARED BY: Date: January 30, 2018

Andy Adler, PhD, Chair, CUREB-B

Bernadette Campbell, PhD, Vice-Chair, CUREB-B
Appendix B: Recruitment Poster

INTERDISCIPLINARY DESIGN THINKING WORKSHOP

Would you like to participate in a Design Thinking workshop related to the public sector?

This workshop will be held at Carleton University in Ottawa, Ontario on Wednesday February 28th, 2018 at 5:30 pm

My name is Renée Isaac-Saper and I am a Master’s student in the Industrial Design department at Carleton University. I am working on a research project about how design thinking can be used in policy development under the supervision of Professor Stephen Field and Professor Heather Dorries.

Design Thinking is a creative approach to problem solving using design practices, which can be applied to social contexts. It is collaborative in nature and perspectives from different disciplines can benefit the process.

To be eligible for this study, you must be one of the following:

- Someone who has experience working with public policy
- An experienced designer who has worked in a multidisciplinary environment and holds a design degree or diploma from a post-secondary institution
- An educator in the School of Public Policy and Administration
- A current graduate student and / or graduate of the School of Public Policy and Administration
  And
- All participants must be 19 years of age or older, and your participation is voluntary

This interdisciplinary workshop will focus on using creative methods to help improve food accessibility in Northern Canada. The workshop will take place on campus over 3 hours.

Participants will be compensated with a $10 Starbucks gift card, food and refreshments will be served.

If you are interested in participating, please email reneesaacsaper@cmail.carleton.ca for a full recruitment notice.

The ethics protocol for this project has been reviewed and cleared by the Carleton University Research Ethics Board. If you have any ethical concerns with the study, please contact Dr. Andy Adler, Chair, Carleton University Research Ethics Board – B (by phone at 613-520-2100 ext. 4695 or via email at ethics@carleton.ca). CUREB-B Clearance # 108434
Appendix C: Consent Form

Consent Form

Title: Interdisciplinary design thinking workshop

Date of ethics clearance: January 30th, 2018

Ethics Clearance for the Collection of Data Expires: January 31st, 2019

CUREB-B Clearance # 108434

I ______________________________________, choose to participate in a study on design thinking in the public sector using the design thinking methods of visualization through mind-mapping (drawing connections on paper), sketching and low fidelity prototyping (simple paper mock-ups). This study aims to gain feedback on your level of understanding of design thinking, your perspectives on the potential benefits or drawbacks of design thinking as an approach to problem solving in the public sector, and your interest in working with expert designers /experienced public servants in a collaborative manner through the use of a design workshop. You will be asked to fill out 2 questionnaires and participate in a semi structured interview and group discussion at the end of the study. **The researcher for this study is Renée Isaac-Saper in the School of Industrial Design at Carleton University.**

She is working under the supervision of Assistant Professor Stephen Field and Assistant Professor Heather Dorries in the School of Industrial Design at Carleton University.

Your participation is completely voluntary. You may withdraw from the study at any time up until March 7th, 2018.

---

Eligibility

To participate in this study, you must be one of the following:

- A person who has experience working with public policy
- An experienced designer who has worked in a multidisciplinary environment and holds a design degree or diploma from a post secondary institution
- An educator in the School of Public Policy and Administration
• A current graduate student and / or graduate of the School of Public Policy and Administration

All participants must be 19 years of age or older

**The Study and Tasks**

**Design Thinking** is a creative approach to problem solving using design practices which can be applied to social contexts. It is collaborative in nature and multiple perspectives from various disciplines benefits the process.

This study involves one design thinking workshop. With your consent, the last portion of the study session will be audio video-recorded. The audio-video recording is optional. No photographs of participants will be taken.

Once the recording has been transcribed, the audio-visual recording will be destroyed immediately. Photographs will be taken of the final outputs from the workshop (sketches, mind maps, paper prototypes).

**Study Purpose**

This study aims to gain feedback on your level of understanding of design thinking, your perspectives on the potential benefits or drawbacks of design thinking as an approach to problem solving in the public sector, and your interest in working with designers and public sector experts in a collaborative manner through the use of design thinking.

The study session will take approximately 3 hours to complete. With the guidance of a moderator, you will be asked to engage in a series of design thinking methods in collaboration with the other participants. The design thinking workshop will be focused around developing a solution to improving the access of nutritious food in Northern Canada.

The study also includes two questionnaires which you will be asked to fill out. These questionnaires will be anonymous, however you will be asked to share your area of professional discipline, position title and area of expertise. The first questionnaire will be asking you about your previous experience with creative problem solving processes in professional or educational settings. The second questionnaire will be asking you to give feedback on the experience of using design thinking in the workshop and working with the other participants on your team.

**Workshop Outline**
The workshop will run as follows over a 3 hour period:
Introductions
Questionnaire 1
Design Thinking methods overview and problem scenario presentation
Break
Problem solving session
Semi structured group interview / open discussion
Questionnaire 2

Risks

As this project will ask you about your professional experience, there are some potential professional risks to you if your statements are critical to your employer. While this risk is expected to be minimal, care will be taken to protect your identity by not using your name, however you will be asked to share your area of professional discipline, position title and area of expertise.

In this group setting, responses from the semi structured open interview at the end of session will not be anonymous for all participants and the research team present at the workshop because of face to face discussion. Questionnaires will be anonymous. All published data including your responses from the open interview at the end of the study will be anonymous to anyone who did not attend the workshop. Your name will not be used in published material.

Because of the group setting of this research, it is possible that you may encounter other participants in future employment contexts, or you may already know one another, and because of this, the research team cannot guarantee that participation will not result in any negative professional or social consequences.

Should you experience any distress during the session, you will be provided with contact information for counseling services available nearby.

Mild emotional risks may occur as you work through the problem scenario and may find it stressful if you are concerned about time limitations, whether you have enough background knowledge of the situation or if you find the problem scenario of sustainable food difficult to discuss.

The study does not involve physical risks which exceed risks encountered in daily life (sitting at a table, using scissors, paper and writing tools).

You are free to skip any questions during the study.
You have the right to end your participation prior to or during the study at any time, for any reason, up until 1 week after you participate in this study (March 7th, 2018). You can withdraw by phoning or emailing the researcher or the research supervisor.

Compensation

As a token of appreciation, you will receive food and refreshments during the study. Parking will be reimbursed and you will receive a 10$ Starbucks gift card.

Benefits

You may benefit from having the opportunity to work with and talk to professionals in fields different from your own and whom you may not have had the chance to work with prior to this study. If you are unfamiliar with design thinking as a problem solving approach, you may benefit from the experience and can choose to explore this method further to improve work in your professional career.

Data Security

All research data, including audiovisual-recordings, photographs and any notes will stored on a password protected USB key and secure password protected laptop. Any hard copies of data (including any handwritten notes or USB keys) will be kept in a locked cabinet in the principle researcher’s office. Research data will only be accessible by the researcher and the research supervisor.

Audio-visual data will be deleted from the USB key and recorder immediately after it has been transcribed and verified. Photographs of the workshop outputs (sketches, mind maps, prototypes) will be used in future publications. No photos of participants will be taken.

Once the project is completed, all research data will be kept for five years. At the end of five years, all research data will be securely destroyed. (Electronic data will be erased and hard copies of questionnaires will be shredded after five years.)

If you would like a copy of the finished research project, you are invited to contact the researcher to request an electronic copy which will be provided to you.
The ethics protocol for this project was reviewed by the Carleton University Research Ethics Board, which provided clearance to carry out the research. If you have any ethical concerns with the study, please contact Dr. Andy Adler, Chair, Carleton University Research Ethics Board-B (by phone at 613-520-2600 ext. 4085 or via email at ethics@carleton.ca).

**Researcher contact information:**
Name: Renée Isaac-Saper  
Department: School of Industrial Design  
Carleton University  
Tel: 613-520-5672  
Email: ReneeIsaacSaper@cmail.carleton.ca

**Supervisor contact information:**
Name: Stephen Field  
Department: School of Industrial Design  
Carleton University  
Tel: 613-520-2600-ext-8371  
Email: StephenField@carleton.ca

**Co-supervisor contact information:**
Name: Heather Dorries  
Department: School of Public Policy and Administration  
Carleton University  
Tel: 613-520-2600-ext-8544  
Email: heather.dorries@carleton.ca

Do you agree to be audio-video-recorded: _____ Yes _____ No

________________________     ______________  
Signature of participant      Date

________________________     ______________  
Signature of researcher      Date
Appendix D: Questionnaire 1

Please specify if you are a:

**Designer**
Specialization: UX/UI___ Industrial___ Graphic___ Other______________________________

**Public Servant**
___Title (manager, director, junior, etc.):__________________________________________

Specialization (i.e. analyst, researcher, designer, operations, communications, service, policy developer etc.)

________________________________________________________________________

What level of government? Municipal___ Provincial___ Federal___

**Professor**
___ Department: Public Policy and Administration____

Other____________________________

Area of specialization:___________________________________________________________

**Graduate Student**
___ Masters____ PhD____

Department: Public Policy and Administration____ Other__________________________

Area of specialization if applicable:_______________________________________________

1) Have you ever worked in the public service?

Yes___ No___

If yes, at what level of government? Municipal___ Provincial___ Federal___

2) Have you ever been a participant in a design workshop?

Yes___ No___

3) Which methods below do you believe to be creative methods? Check all that you think apply

Visualization___ Sketching ___ Prototyping___ Journey Mapping ___ Mind Mapping___

Brainstorming___ Concept Development ___ Co-creation___ Observation___
100

Scenarios___  Framing___  Experimentation___

Other:

Designers- please skip to question 10

4) If you have worked in the public service, have you used any of the above methods while working in the public service?

Yes___  No___

5) If yes, which ones? Please list:

6) Have you worked in a team that included professional designers in the public service?

Yes___  No___

7) Are you aware of design thinking being used in the public service?

Yes___  No___

8) If yes, have you used design thinking while working in the public service?

Yes ____  No___

9) Have you used design thinking outside of the public service in any of the following areas? Check all that apply

Private sector work environments___  University___  College___  High School___  Workshops___
Training Program___  Skills Development Program___  Other_________________________


   a) I have never heard of this goal / issue ___
   
b) I have heard of this goal / issue___
   
c) I have a little knowledge of this goal / issue___
   
d) I have general knowledge of this goal / issue ___
e) I have detailed knowledge of this goal / issue

f) My professional work is directly related to this goal / issue

11) If your professional work is directly related to this goal / issue, have you ever used design thinking to approach this issue?

Yes____ No____ N/A____

12) For Designers only:
Have you ever worked on / collaborated on government projects?

Yes____ No____

13) Would you be interested in working with public servants to help address / solve problems in government?

Yes____ No____
Appendix E: Questionnaire 2

Please specify if you are a:

**Designer**
Specialization: UX/UI___ Industrial___ Graphic___ Other_______________________________

**Public Servant**
____ Title (manager, director, junior, etc.): _________________________________
Specialization (i.e. analyst, researcher, designer, operations, communications, service, policy developer etc.)
________________________________________________________________________

**Professor**
____ Department: Public Policy and Administration____
Other________________________
Area of specialization:___________________________________________________________

**Graduate Student**
____ Masters____ PhD____
Department: Public Policy and Administration ____ Other___________________
Area of specialization if applicable:__________________________________________________

1) Do you think the combined design methods used in this exercise helped to generate new ways of viewing / approaching the problem?

1 strongly disagree____  2 disagree____  3 neutral____  4 agree____  5 strongly agree____
Comments:

2) Do you think the use of mind mapping in this exercise helped to generate new ways of viewing / approaching the problem?

1 strongly disagree____  2 disagree____  3 neutral____  4 agree____  5 strongly agree____
Comments:

3) Do you think the use of prototyping in this exercise helped to generate new ways of viewing / approaching the problem?
1 strongly disagree____  2 disagree____  3 neutral____  4 agree____  5 strongly agree____

Comments:

4) Do you think the use of sketching in this exercise helped to generate new ways of viewing / approaching the problem?

1 strongly disagree____  2 disagree____  3 neutral____  4 agree____  5 strongly agree____

Comments:

5) Do you think the visual representation of the food accessibility in Northern Canada issue in this exercise helped to generate new ways of viewing / approaching the problem? (Toolkit including the map of Canada, contextual factor cards)

1 strongly disagree____  2 disagree____  3 neutral____  4 agree____  5 strongly agree____

Comments:

6) Do you think the group interaction aspect of presenting the food accessibility in Northern Canada issue in this exercise helped to generate new ways of viewing / approaching the problem?

1 strongly disagree____  2 disagree____  3 neutral____  4 agree____  5 strongly agree____

Comments:

7) If you have worked in the public sector, which of the following methods do you think could be helpful to approach problems in the public sector? Check all that apply.

Mind Mapping___  Prototyping___  Sketching___  Visualization / visual representation___

None___

8) If you selected any of the methods in question 7, realistically, how effective do you think they could be when used to approach problems in the public sector?

1 problematic____  2 not effective____  3 effective____  4 highly effective____

Comments:

Designers please skip to question 13
9) Did you find it helpful to have the designer in your group present when using the creative methods to approach the problem?

1 strongly disagree____  2 disagree____  3 neutral____  4 agree____  5 strongly agree____

Comments:

10) What did you like about working with a designer? (Please explain)

11) What did you not like? (Please explain)

12) Do you think working with a designer when approaching problems in the public sector could be helpful? Why or why not?

1 strongly disagree____  2 disagree____  3 neutral____  4 agree____  5 strongly agree____

Comments:

13) For the designers only:

   Did your team members ask you to clarify what prototyping is?

   Yes___  No___

   Did they ask you to clarify what mind mapping is?

   Yes___  No___

   Did they ask you to clarify what visualization / visual presentation is?

   Yes___  No___

   Did they ask you to help them with sketching?

   Yes___  No___

   Did they ask you to help them with anything else? If yes, please explain

14) For all participants: what were the main insights you gained from this exercise? (Please explain, and you may write on the next page if you need more room)

   Thank you for your participation in this workshop!
Appendix F: Debriefing Statement

CUREB-B Clearance # 108434

What are we trying to learn in this research?

Design thinking has been applied to various Canadian governmental departments over the past few years as a tool to help facilitate innovation in the public sector, but there appears to be a lack of academic research on the relationship between design thinking and the Canadian public sector. Within this unknown, there could be a failure to identify whether or not design thinking in the Canadian public sector is a viable and sustainable approach to innovation.

To help gain a clearer understanding of this relationship, this study seeks to gain feedback on your level of understanding of design thinking, your perspectives on the potential benefits or drawbacks of design thinking as an approach to problem solving in the public sector, and your interest in working with designers / public servants in a collaborative manner through the use of a design thinking workshop.

Information will be collected through two questionnaires, a semi structured interview and discussion and observations of the design thinking workshop. The workshop will consist of a problem solving session where you will work alongside public sector and design experts using design thinking methods to produce a hypothetical solution to improved access to nutritious food in Northern Canada.

Why is this important?

From a review of related literature, it appears as though the relationship between design thinking and the Canadian public sector has not been documented and discussed at great lengths from an academic perspective. This research study is important because it can help identify how design thinking in the Canadian public sector is being received and interpreted, as well as highlight potential barriers to the successful use of design thinking in government. The aim is to ultimately produce an academic perspective on the subject to move the conversation about design thinking in the Canadian public sector forward and so that professionals in the public sector and design disciplines in academia and in practice can benefit from this research.

Where can I learn more?

Design Thinking and Innovation Resources

- https://www.ideo.com/pages/design-thinking
- https://dschool.stanford.edu
Appendix G: Customized Map of Inuit Nunangat for Toolkit

Inuit Nunangat

- Inuvialuit
- Nunavut
- Nunavik
- Nunatsiavut

Major Canadian Highways

△ Inuit communities serviced by Nutrition North Canada

-- Main Arctic Shipping Routes (may vary by seasonal factors)

References:
- Canadian Broadcasting Corporation (2017)
- Council of Ministers (2005, p. 35)
- Government of Canada (2016b)
- Indigenous and Northern Affairs Canada (2006, p. xvi)
- Inuit Tapiriit Kanatii (2018a)
- Inuit Tapiriit Kanatii (2018b)
- Transport Canada (2004)

Locations and routes are approximate
Appendix H: Contextual Factor Cards for Toolkit
Your task:

As a group, what can the Government of Canada do to improve the accessibility of healthy food in Northern Canada?

You may use any or all of the 3 design methods below to generate and present your ideas.

You have 45 minutes

Design Methods to Use

- Mind Map
- Sketching
- Low Fidelity Prototyping
Appendix J: Tip Card for Toolkit

Tip Card

- Feel free to draw or write on the map and cards at your station.
- Use any blank cards to fill in missing contextual factors you might think of.
- Play around / arrange the context cards to help generate ideas.
Appendix K: List of Toolkit Materials for Workshop Participants

- Large sketching paper pads
- White letter sized paper
- Construction paper
- Colour pencils
- Crayons
- Markers
- Pens
- Tape
- Scissors
- String
- Presentation boards
Appendix L: User Response Analysis for Questionnaire #1

<table>
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<th>Responses</th>
<th>User-ID</th>
<th>Task</th>
<th>Participants</th>
<th>Perceived Cost</th>
<th>Perceived Ease</th>
<th>Perceived Value</th>
<th>Time Spent</th>
<th>Risk Assessment</th>
<th>Profitability</th>
<th>Overall Satisfaction</th>
<th>Social Media Engagement</th>
<th>Other</th>
<th>Frequency</th>
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Appendix M: User Response Analysis for Questionnaire #2

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<th>Question 3</th>
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</tbody>
</table>

Note: This table represents a sample of user responses to various questions from Questionnaire #2. The responses are categorized as Agree, Disagree, or Neutral.
Appendix N: Workshop Presentation Slides

1. Interdisciplinary Design Thinking Workshop
   Welcome Participants!

2. Overview
   - After this introduction, you will be asked to form into 3 groups at 8 workstations.
   - You will be asked to work together using 8 design thinking methods to address 1 program statement.
   - Each group will have 1 moderator.
   - You will be asked to briefly present your final ideas to everyone at this workshop.
   - There will be a 30 minute group discussion at the end and 1 questionnaire.

3. Design Thinking
   - Design Thinking is a creative approach to problem solving using design practices and creative thinking which can be applied to varying contexts.
   - It is collaborative in nature.
   - Perspectives from different disciplines can benefit the process.
   - The process has been used in areas including healthcare, business, education, and government and can be used to help address complex problems.

4. Design Thinking: some key themes and methods
   - User-centered focus
   - Observation
   - Risk-taking
   - Experimentation
   - Visualization
   - Mind Mapping
   - Prototyping
   - Sketching
   Today’s focus

5. Methods you will use in this workshop
   Sketching: using art media such as pens, pencils, markers and crayons to represent information in visual formats through shapes, illustrations, tables, charts.

6. Sketching
   [Image of sketches]
Methods you will use in this workshop

Mind Maps: A visual presentation of a problem, theme, or issue with connecting sub-themes being drawn out from the central theme on paper using pens, pencils, markers, or crayons. Words and drawings can be incorporated into the mind map. This is a helpful way to creatively organize and generate thoughts around a specific topic.

Low fidelity prototyping: simple mock-ups of ideas using paper, cardboard, and tape, string and scissors. Examples of low fidelity prototypes could be maps, houses, community/city layouts, system paths, physical products.

Your task as a group: how can you generate new ideas to improve accessibility of healthy food in Northern Canada from a federal policy perspective?

Geographical focus: the 4 regions of Nunavut (Nunavut regions in Canada)
- Inuvik
- Nunavut
- Nunatsiaq
- Nunavik

Problem Context

In 2015, the federal government presented a 3 year sustainability plan called "Achieving a Sustainable Future: a federal sustainable development strategy for Canada 2015-2019" (Government of Canada, 2015).

1 of their 13 aspirational goals is a plan for sustainable food, which includes ensuring that everyone in Canada, including people in northern communities, have access to nutritious food. This will be the focus of this workshop session.
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Food insecurity in Inuit Nunangat: some factors:
- Food-related community needs more extreme food security challenges
- Inadequate harvest food and low incomes
- Transportation costs
- Store maintenance in remote communities
- Food prices
- Inventory costs
- Changing wild stocks
- Variable distribution of wildlife
- Changing environmental conditions
- Transportation delays
- Changing access to hunting grounds
- Climate change
- Loss of traditional knowledge
- Environmental contaminants

(Adapted to by the Food Security Coalition, 2016)

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What is already being done?

The Federal Initiative:
2015 expansion of nutrition North Canada

The federal government has provided $64.5 million over five years, and $33.5 million over ten years to Nutrition North Canada, a food subsidy program expanded to reach an additional 87 northern communities for a total of 121 northern communities. (Government of Canada, 2015; Nutrition North Canada, 2015)

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What is already being done?

A Regional Initiative:

The plan aimed to address 6 key themes:
- Country Food
- Shopping Food
- Local Food Production
- Food Safety
- Programs and Community Initiatives
- Policy and Legislation

(Nunavut Food Security Coalition, 2014)

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What is already being done?

Community Initiatives:
- Food banks
- Seed libraries
- Healthy schools
- Community greenhouses and educational programs for growing food
- Local harvesting and hunting
- Culture-based skills sharing programs

(Adapted to by the Food Security Coalition, 2015)

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Your task

In your groups, you may use any or all of the 3 design methods presented here:
- Mind map
- Sketching
- Low-fidelity prototyping

Your goal is to generate ideas for improving the accessibility of healthy food in the regions of Inuit Nunangat from a federal policy perspective.

Other than that, there are no other rules. Use your expertise in design or policy to help contribute to your group.

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Break.

Take 15 minutes to get food and refreshments, form your groups and mingle.
Teamwork Session

Discussion questions

1. How was your overall experience with this exercise?
2. Did you find using the design thinking methods of mind-mapping, sketching and prototyping difficult?
3. How were you able or not able to contribute your expertise and knowledge to the group exercise?

Any other comments / open discussion

Thank You!

References

[References page]

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Appendix O: Workshop Schedule

Workshop Schedule 5:30-8:30pm
(time allotted for all segments is estimated, might be shorter or longer)

5:30-5:45 Welcome / arrivals / snacks (15 mins)

5:45-6:05 Introduce research team, consent forms, Questionnaire 1 (20 mins)

6:05-6:25 Workshop Intro to all participants with Power-point (15 mins max plus 5 mins for questions)

6:25-6:40 Break - participants get food, form groups (15 mins)

6:40-7:25 Teamwork session (45 mins)

7:25-7:35 Teams consolidate ideas, present to everyone at workshop (10 mins)

7:35-7:55 Group discussion (20 mins)

7:55-8:15 Questionnaire 2 (20 mins)
Appendix P: Workshop Agenda for Participants

Interdisciplinary Design Thinking Workshop Agenda

February 28th 2018, 5:30 pm
Appendix Q: Semi Structured Group Interview / Discussion

1. How was your overall experience with this exercise?

2. Did you find using the design thinking methods of mind-mapping, sketching and prototyping difficult?

3. How were you able or not able to contribute your expertise and knowledge to the group exercise?

Any other comments / open discussion.