

How Gender-mainstreamed Spatial Programming in Emergency Shelters can Mitigate
Gender-based Violence Against Women Following Disaster Events

by

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Abstract

There is a notable trend of gender-based violence rates increasing against women following disasters. A lack of adequate shelter is a contributing factor that exacerbates this social issue. A lack of the consideration of gendered needs in planning these shelters' spaces may result in women being more vulnerable to violence when utilizing emergency shelters. This study employs a case study with data drawn from literature and interviews with practitioners in the field. The cases considered are the Southern Alberta Flood in 2013 and Hurricane Katrina in 2005, focusing on two municipalities with significant evacuations due to overland flooding: Calgary, Alberta, and New Orleans, Louisiana. The findings point to a need to consider gender in spatial programming decisions in shelters. Practitioners demonstrated a robust understanding of the unique role that space can play in women's safety. A key finding is that while gender-based violence stems from existing patriarchal arrangements, and is exacerbated in disaster as men cope with trauma, this phenomenon has spatial components that are also a reflection of the gender gaps in society. How women are considered, or not, when organizing space affects their sense of safety, as well as their vulnerability. Reducing stress where possible for those who rely on emergency shelters while simultaneously integrating gender-mainstreamed spatial programming in planning emergency shelters will support women following a disaster event.

Keywords: gender, gender-based violence, emergency shelter, space, spatial programming

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Table of Contents

Creative Commons Statement	3
Abstract	4
Acknowledgements	5
Chapter 1: Research Introduction	11
Research Question	14
Rationale	15
Outline of the Project	16
Chapter 2: Literature Review	18
Space, Place & Disaster	19
Gender, Space & Disaster	23
Space & Gendered Violence	29
Constructing Women-Friendly Space	33
Emergency Management Shelter Standards: ‘To be or not to be’ equitable?	38
Summary	42
Chapter 3: Methodology	43
Cases	45
Case 1: Southern Alberta Floods, 2013 in Calgary, Alberta, Canada	46
Case 2: Hurricane Katrina (2005) in New Orleans, LA, United States of America	50
Participant Recruitment	55
Table 1	56
Agencies Sourced for Interview Participants	
Ethics	57
Conducting the Interviews for the Cases	58
Chapter 4: Data Analysis	60
Researcher Role	60
Thematic Analysis & Coding	62
Table 2	63
Sample of trending themes extracted in context of research questions	
Figure 1	65
Thematic Analysis shifting into Narratives	

Study Limitations	65
Chapter 5: Findings	68
Literature to Reality	68
Figure 2	69
Spatial Analysis of a Mass Emergency Shelter Plan	
Interview Participants' Recruited	70
Table 3.	70
Participants' Characteristics	
Themes	71
Practice: Effective 'Boots on the Ground'	72
Don't Just Plan, Adapt and Problem Solve.	72
Preparing Practitioners.	74
Relationships.	75
Fostering Safety Holistically	77
The Concept of Space	78
Basic Needs.	81
Control & Defining Safety.	85
Coping Mechanisms.	88
Status Quo: Managing Assumptions and Noting Expectations	90
Women & Children.	90
Privacy & Community.	93
Intersectionality.	97
Chapter 6: Discussion	99
Physical Space	100
Perceived Space	104
Understanding Place & Gender Based Violence	107
Chapter 7: Recommendations & Conclusion	112
Training	112
Integrating Spatial Awareness to Foster Conceptual Safety	113
Trauma Informed Action	114
Exercises	114
Leveraging Internal Capacity	115
Creativity & Play	116

Increasing Awareness	117
Emergency Management	117
Reconceptualizing Planning	118
Redefining Basic Needs	118
Stakeholder Engagement: Who is not at the table?	119
Relationships	120
Communication Plans	121
Policies & Legislation	121
Building Codes, Land Uses & Design Practices	121
Intersectional Policy & Standards	122
Research	123
More Diversity in Engagement	123
Integration of Knowledge	124
Conclusion	124
References	127
Appendix A	144
Key Terms of Reference	144
Terms related to Gender	144
Gender.	144
Gender Mainstreaming.	144
Gender-based Violence.	145
Structural Violence.	145
Terms related to Architecture & Designing the Built Environment	145
Architectural Body.	146
Architectural Procedure.	146
Built Discourse.	146
Terms Related to Criminology	146
Crime Pattern Theory.	147
Space Syntax Theory.	147
Terms Related to Shelter	147
Shelter	147
Permanent Housing.	147
Transitional Housing.	148

GENDER-MAINSTREAMED SPATIAL PROGRAMMING IN SHELTERS	10
Temporary Shelter.	148
Emergency Shelter.	148
Mass Sheltering	148
Appendix B	150
Interview Participation Letter of Consent	150
Appendix C	153
Interview Questions	153

Chapter 1: Research Introduction

Between 2005-2015, approximately 1.5 billion individuals globally were directly impacted by a disaster event, with women and children among those most heavily affected (United Nations Office for Disaster Risk Reduction, 2015). One of the most striking patterns in the wake of disaster events is that gender-based violence against women increases rapidly at home and in communities. Today, approximately 35% of women are survivors of gender-based violence. In a catastrophic event, rates of gender-based violence consistently tend to double (UN Women, 2017). These statistics are relatively ubiquitous in their applicability, as globally, this pattern continues to resurface in disasters' after-action reports and research across various disciplines (Sanhi et al., 2016; UN Women, 2017; Hirani et al., 2019; Valerio, 2014; Chaudhary et al., 2017; Khan, 2016). In addition, there is a documented pattern of increases in gender-based violence rates in the shelters provided by humanitarian and disaster response organizations (Juran, 2012; UN Women, 2017; UNISDR, 2015; Marsh et al., 2006; Martino et al., 2020).

Emergency shelter research and practices focus more on the physical realm and the specific functions provided (i.e., sleep, food, hygiene). The primary function is to remove those impacted by hazards from immediate danger when considering providing a safe and secure environment (Farmer et al., 2018). Though, does this constructed safe space look and feel the same for men and women? Conversations about gender are more functional, discussing women's varying biological needs requiring different spaces and supplies to support their wellbeing. Gender-based violence tends to occur in specific locations in shelters, such as bathrooms and other spaces linked with more privacy (Juran, 2012; Pain, 2001; Farmer et al., 2018). The

research reveals many options alleviate the issue, yet it persists. There is a need to dig a little deeper to understand better if and how gender may change how one experiences their environment. Space syntax theory sensitizes us to how the organization of space can inform and provide insight into why humans may act in the way that they do in specific environments (Change & Liao, 2015). It is a lens used in criminology, architecture, and urban planning circles. The intent is to create safe and more efficiently built environments and highlight how our decisions create space and experience its influence. This project considers if the organization of space in an emergency shelter may be replicating spatial arrangements that encourage problematic or even criminal behavior. It may be possible to understand better why gender-based violence may occur in these particular environments.

Via the examination of how spaces influence human behavior, crime pattern theory lends specifically to identifying trends tied to negative behavior (i.e., violence). This theory tries to foster a shared understanding of why and where crime will occur in specific environments. Farmer et al. (2018) noted that "criminal victimization requires individuals to interpret their environment based on social cues" (p.196). For example, men tend to fear physical violence from a group of men. In contrast, women are more concerned with the fear of sexual violence from one man (Farmer et al., 2018). Pain (2001) stated that women's fear of sexual violence often did not align with the actual likelihood of where that kind of crime would occur. For example, most women fear violence occurring in public spaces at the hands of strangers, despite research demonstrating that it is more likely to happen in their private spaces (Pain, 2001, p. 903). Modern researchers theorized that fear is a combination of the underlying gender inequalities and

underreported domestic violence and rape instances, accounting for this apparent dissonance in the data and fear perceptions (Pain, 2001).

While many agree that underlying societal patriarchal beliefs regarding gender have a role in gender-based violence, there is a keen focus on the lack of an adequate shelter, whether it be one's own home or an emergency shelter. Suppose practitioners are more readily able to understand what adequate shelter looks like for men and women alike. In that case, that may help shift the trends seen with gender-based violence in the aftermath of disasters (Hilhorst et al., 2018; UN Women, 2017; UNISDR, 2015; Marsh et al., 2006; Martino et al., 2020). This project will seek to understand the gendered relationships between space and disasters and consider what a safe space may look like for women.

Research into how to best understand the relationships between women and shelter in the context of disaster and emergency management is slowly growing. Understanding the relationship with space through a gendered lens could expand the tools that emergency managers must draw on when navigating, planning, responding to, and supporting recovery for women following a disaster event. Other fields, such as criminology, urban planning, and architecture, have explored the influence that the physical environment can play in our day-to-day lives (Townsend, 2009; Gerell, 2018; Gins & Arakawa, 2002; Chang & Liao, 2015). These findings consistently point to gender-based violence's social, cultural, and political components, pinpointing the need for a multi-disciplinary approach to effectively address the problem. This research will introduce a new perspective to consider how women and men may experience space differently.

There are functional aspects of physical environments that reduce violence and criminal behavior, such as lighting, humanoid art, and a locking door. There are also social factors to consider and implement, such as cleanliness, cultural awareness, other people, purpose (i.e., spaces for activities and community engagement), and a sense of belonging. This research draws on multiple sectors' knowledge and experiences. The findings of this project help identify how emergency management practitioners can mitigate gender-based violence against women via an emergency shelter's spatial program (i.e., the organization of uses in different spaces in a building). Doing so will enable a more holistically safe and resilient rebound in affected communities post-event.

Research Question

This research project asks the question: can spatial programming in emergency shelters, that considers gendered experiences of space, decrease women's and girls' exposure to potential incidences of gender-based violence? In addition to this, there are vital sub-questions that subsequently explore pieces of this overarching research question:

- How do existing standards and practices consider gender when planning and operating spaces in emergency shelters?
- Do practitioners consider space and its ability to affect behavior in emergency shelters? If so, how?
- What are some of the ways women use space differently than men? How is this accommodated in practice and during events?

- Are there any aspects of the physical environment noted in the research that may prime individuals to commit gender-based violence against women?

By exploring these questions, this project may shed light on ways gender biases are escaping society's more immediate awareness when providing adequate emergency shelter following disaster impacts. Using literature and research methods that look at gender-based violence from different perspectives, this work understands this issue's nature from a new angle and identifies possible solutions. Interdisciplinarity, "the quality or fact of drawing on two or more branches of knowledge" (Lexico, 2021, para. 1), is applied to effectively explore the complex nature of gender roles and their influence on physical spaces and sheltering practices. This integration of the various perspectives and knowledge reiterated in applicable disciplines served to frame the relationship between gender, space, disasters, and violence from a more holistic perspective. Addressing the research question required a melding of knowledge from various areas, including disaster and emergency management, criminology, urban planning, architecture, feminism, and sociology.

Rationale

This study will foster a better understanding of whether shelters' programmed space might be creating an environment that unknowingly fosters gender-based violence against women following a disaster. Disaster and emergency management best practices for providing shelter cite specific minimum requirements to meet to provide the bare necessities to support individuals' needs in a time of crisis. Though there is little guidance built into these requirements that outlines how those needs for men and women may differ and what that would look like

when implemented (Marsh et al., 2006; UN Women, 2017; Vall, 2020; Saito, 2014; Martino et al., 2020; Sweet & Ortiz Escalante, 2015). The goal is to identify how elements of sheltering practices that may not be considering women's unique spatial needs could increase the vulnerability of women to gender-based violence. Instead, the data and findings may provide some insight into practices to avoid and possible alternatives to be implemented in future events to improve the safety and security of women in the shelters. These unearthed options would help foster the balanced consideration of gendered needs in emergency shelter practices (i.e., planning, implementation, recovery), resulting in a more 'gender mainstreamed approach. Eklund and Tellier (2012) point to gender-mainstreaming as an essential practice, which:

refers to the integration of the women and men's needs and perspectives as a fundamental dimension to be considered in any aspect of the creation and implementation of policies, plans, and programmes across the various spheres that govern modern society (pp. 593-594).

This research project seeks to provide practical insights for practitioners, helping them understand what this integration of different gendered needs looks like when considering spaces in emergency shelters.

Outline of the Project

By drawing on various findings from different bodies of knowledge, this study aims to develop a foundational understanding of the relationship between gender, space, disaster, and gender-based violence. The third chapter will discuss the methodology, an instrumental case study composed of two cases: Southern Alberta Floods (2013) and Hurricane Katrina (2005),

leveraging data from the literature and interviews with practitioners involved in the specific cases. The selection of the two cases is due to each community experiencing impacts caused by overland flooding that triggered mass evacuations, which required the provision of emergency shelter for thousands. In addition, the applicable socio-economic contexts for each community may help highlight different vulnerabilities, such as race and economic status, that could be playing out in this particular problem. The analysis of the data will then be discussed, outlining the specific lens and analytic approach. Findings follow, summarizing the key themes unearthed in the research and then discussing them in the context of the literature in the following chapter. The final chapter outlines recommendations for practitioners to implement when planning, operating and managing emergency shelters to better support women's resilience following a disaster event.

Chapter 2: Literature Review

This chapter will draw on peer-reviewed and grey literature from trusted government and non-government agencies. The review will delve into the overarching themes used to establish a current understanding of research and practices regarding gender, space, disaster, and gender-based violence. The study uses a social constructivist and feminist lens when reading and interpreting the literature. These lenses suggest that gender roles are not the result of biological factors but instead fabricated by people. Whether consciously or not, these socially constructed roles may also inform how society makes decisions in day-to-day life. For example, consider a gender bias applied to the physical construction of space, such as considering the layout of a home's floorplan versus a public government building (Auerbach & Silverstein, 2003). Both spaces have unique functions but are typically governed and occupied by men and women in different ways. A social constructivist, and feminist lens, would ask if the spaces are constructed in such a way to reflect, and even maintain, the gender norms of the community. In addition, there is an underlying expectation that disaster and emergency management practices implemented should support diverse needs and facilitate a more equitable recovery within communities (Yin, 2018; Auerbach & Silverstein, 2003).

The literature review has four sub-sections: 'Gender, Space and Disaster,' 'Space and Gendered Violence,' 'Constructing Women-friendly Space,' and finally, an overview of how the available standards in disaster and emergency management consider and integrate gender. Each section works to integrate the literature from various disciplines to build out an understanding of the research problem at varying scales of physical space (i.e., urban, neighborhood, individual).

The interdisciplinarity of the literature review serves to capture how gender roles and considerations are prevalent in many parts of society. Many of these pieces of society interconnect in their influence on how the organization and construction of space happens (Martino et al., 2020; Valerio, 2014; Pain, 2001).

Space, Place & Disaster

Disaster events are the great disruptors of society's status quo. Depending on the hazard, familiar pieces, such as cherished landmarks, and the familiar places one frequently visits as part of daily life, can vanish in an instant. The most direct evidence of the hazard impacts and subsequent disruption is the impact on our built environment. Places that we once loved and cherished become disfigured, spaces that were once safe are no longer available to us. The painful reality is that thousands of people worldwide are displaced annually by disasters (UNISDR, 2015). These changes to our surrounding environments have significant cascading psychosocial, economic, and political impacts (Carroll et al., 2009). Townsley (2009) stated that our attachment to space matters substantially. Foundational elements of our lives are shaped based on where we live: "economic opportunity, social capital, quality of governance, and physical well-being" (Rumbach et al., 2016, p. 2047). These influential pieces of our daily lives inform how our society is built spatially and influence how a society goes about maneuvering, responding, and recovering from the loss of familiar features.

A significant way that space, place, and disaster interact in disaster and emergency management is via providing shelter to displaced populations. The literature frequently stipulates what is required to provide adequate shelter following a disaster event. These components

include protection from the elements, privacy, dignity, access to food, water, and sanitation facilities, security, community services that support social capital (e.g., employment, churches, libraries), and being able to do the essential daily activities (Sphere, 2018; Royal Roads University, 2010; Davis, 2011; Asgary & Azimi, 2019). According to Asgary and Azimi (2019), many variables would change how and where practitioners may erect emergency shelters. These are:

disaster characteristics (i.e., familiarity, duration, severity, the scope of impact, destructive potential, and the length of the warning period), demographic characteristics (such as age, gender, physical disabilities, race, and ethnicity), shelter characteristics (such as campsites and community centers), perceived awareness of hazards and preparedness level, social bonds in emergency shelters and socioeconomic status (such as education and income) (p. 132).

Thus, there can be a myriad of options and different choices made following a disaster event. Each situation will have unique characteristics that inform the emergency management and response agencies' decisions. It is unlikely that there is a single perfect solution. However, a greater understanding of these varied characteristics can help staff in emergency shelters to make more strategically beneficial decisions that support an effective and equitable recovery for those impacted. Increased awareness can be critical when repurposing existing facilities, usually buildings whose original construction did not include supporting needs such as sleeping, childcare, and daily hygiene. Certain types of facilities may be more adaptable to effectively meet the needs of an emergency shelter, with fewer complications, than others. The practice of

repurposing existing facilities to meet the immediate needs of a displaced population is not uncommon, as it is a faster way to meet the needs of larger groups of people. However, these types of shelters have a short lifespan before they start to negatively impact the mental health of inhabitants (Asgary & Azimi, 2019).

Davis (2011) reviewed critical lessons learned from practitioners and users over forty years of disaster shelter provision experiences. He stated that shelter should holistically account for social, economic, and environmental factors for communities. This finding ties into a key lesson: it is crucial to consider that the spaces used to provide shelter and temporarily replace where people live are not merely functioning as a house but as a home (Davis, 2011). It is essential to create a sense of place in shelters, representing the underlying emotional needs met through a sense of connection to the physical surroundings or space. Davis (2011) noted significant improvements in overall recovery when the holistic approach integrating social, economic, and environment into shelter practices were applied. The factors at play in our connection to a physical space also align with factors at play when trying to understand vulnerabilities to disaster impacts.

Considering the reach of the vulnerabilities that exist due to the flaws in our social, economic, and environmental systems when planning the use of space in emergency shelters can help practitioners do so more effectively. For example, women have frequently complained that emergency shelters often lack private spaces to manage their reproductive health and hygiene. In the context of thinking about it from the perspective of vulnerability, it may be helpful to look at how society handles women's health in the day-to-day systems at play. Is women's health a topic

that is commonly discussed and handled positively? Or is it handled with discomfort and disdain? Looking at society's attitudes around certain subjects can shed light on why there may be issues with addressing gaps noted in practice. Cutter (2003) argued that thinking about vulnerability requires considering the interdependent dynamics of all systems present in society today: manufactured, natural and human. This emphasis on interdependence derives from place and vulnerability, resulting from the community's existing social, political, cultural, and environmental practices (Akerkar & Fordham, 2017; Bradshaw, 2012). The interconnectedness of these systems appears in how we build our urban environments. For example, this can manifest in certain types of buildings, parks, and infrastructure constructed in particular areas, how we allocate funding and where we encourage populations to settle. Modern urban planning and architectural practices recognize that "a city or building can thus be literally 'read' as a map of aspects of a society, its social structures and values" (Boys, 1998, p. 206). To date, much of the disaster and emergency management research and practices focus on the physical makeup of structure and its capacity to withstand various natural hazards when looking at resilience and shelter (Farmer et al., 2018). However, what is missing is understanding the integration of the physical and metaphysical realms (Mitchell et al., 2012; Akerkar & Fordham, 2017; Lidewij, 2013). This research recognizes how space, place, and disaster interact, identifying additional opportunities that emergency management practitioners can leverage to improve individuals' and the community's effective recovery.

Gender, Space & Disaster

The architectural body is the scale at which a single person is interacting with a specific space. The built spaces would be the "architectural surround - modularly constructed areas and the architectural procedures they engender" (Gins & Arakawa, 2002, p. 57), spatially programmed or arranged in such a way as the use and users would require. A person is moving through a built space based on their architectural body, meaning "that which prompts (architectural surround) and that which gets prompted (organism-person)," resulting in affecting how one would act in specific spaces versus others (Gins & Arakawa, 2002, p. 57-64). Thus, the architectural body is influenced by space syntax, which unconsciously informs human behavior (Chang & Liao, 2015; Gin & Arakawa, 2002). An example of this would be walking into a public space, such as a theatre or museum. Most of these buildings have similar features, and most result in a certain kind of movement through the space. When entering the building, usually, there is a wide-open space with a marked path to proceed through the space, either through the placement of columns or perhaps a set of grand stairs. People may feel pulled through this space, moving towards certain features as opposed to others. For example, there are likely higher ceilings and brighter lighting encouraging individuals to slow their gait in the initial entry unconsciously. If the designer has areas that need to encourage faster movement, the corridors will start to narrow. The discussion of architectural practices is an example of the different scales of the physical environment influencing the individual to operate in a space in a general way, otherwise referred to as space syntax (Chang & Liao, 2015; Gins & Arakawa, 2002).

The application of space syntax can be helpful when considering the impacted areas following a disaster event and anticipating which areas may be more resource-intensive to support the community's safety. For example, Gerell (2018) identified much lower incidences of violent crime at major public transportation access points where the pedestrian traffic is far greater (p.367). When disaster impacts occur, they can disrupt individuals' known landscape and patterns of navigating it. New options are needed. Depending on the nature of the impacts, women may be more vulnerable to violence. The risk increases if they have to navigate spaces that they are less comfortable with in order to be able to access resources and services to support their daily lives. Other research reiterated this, highlighting the perspective from women's spatial preferences in public spaces. Women tend to prefer urban areas that have a high integration of street and pedestrian traffic, explicitly noting that this preference was applicable only when businesses on these streets were operating (Nguyen & Van Nes, 2013). After which, a notable drop-off in women's use of those spaces occurred. Noting the relationship between gender, space, socioeconomic and political underpinnings helps us deconstruct critical aspects of an individual's spatial influences and, in turn, possibly patterned behaviors. Doing so supports emergency managers in better understanding how this relationship may change how women experience emergency shelter spaces differently.

Feminist literature discussing the relationship between gender and space has advocated expanding research to reach women in their day-to-day lives (Spain, 2016; Martino et al., 2020; Enarson et al., 2007; Valerio, 2014; Lidewij, 2013). The most common pattern in how society builds its communities is the day-to-day private (i.e., home life) and public (i.e., political, social,

professional) divide. The private sphere focuses on the "largely reproductive (women-centered)" spaces of the home juxtaposed with the "public urban life (men centered)" spaces (Sweet & Ortiz-Escalante, 2015, p. 1830). Spain (2016) noted that the expected primary role of care within the home (for children, elderly family members, and spouses) isolated women from public activities and move women to society's periphery. Until recent historical memory, a woman referred to as a "public woman," suggested that she was, in fact, likely a "prostitute" (Ainley, 1998, p. 64). This euphemism persisted as women were generally not seen in the public sphere unaccompanied, as this was not in alignment with where a 'good woman' would find herself. That, and she would have no reason to occupy the public spaces in such a way, as she had no place there professionally, politically, or socially. The exception was when it was in service of men's needs. The euphemism that a woman occupying public spaces is a prostitute illustrates that the general public made assumptions about the individual based on prevailing social norms. When one deviates from the status quo, the deviation implies a particular personal identity, occupation, and values. Such an assumption helps to underline what gender would imply about the spaces that people occupy. Martino et al. (2020) noted that when talking about violence directed at women, many aspects of the women's experience are rendered invisible to society. Emergency shelters often require a temporary conversion of public space to meet individual private needs (shelter, sleep, food). The tensions that women might be experiencing in both public and private may compound. The existing relationship that women may have to the public and private spaces in their day-to-day lives could create complications when the divide between the two blurs during a disaster. This phenomenon in sheltering practices can highlight how

women may be struggling with feeling secure and possibly being disproportionately impacted when seeking support in emergency shelters.

Disasters disproportionately impact women, regardless of location, hazard type, or socio-cultural differences (UNISDR, 2015; UN Women, 2017; Martino et al., 2020; Marsh et al., 2006; Wisner et al., 2003). The expectations surrounding gender roles "is a global phenomenon" (Juran, 2012, p. 4). Everywhere in the world, women have a common thread of expectations tied to their role and activities within society, regardless of the sociopolitical stance of the country. While the disaster's impact may vary in severity, common themes always surface. For example, looking at 4605 disasters that occurred in 141 countries between 1981-2002, the data suggested that women have a higher mortality rate on average compared to men (Neumayer & Plümper, 2007). This discrepancy is partly due to the biological differences in strength that typically exist between men and women. However, the researchers noted that this alone was not responsible. Their data also noted decreased fatality rates as women's socioeconomic status increased (Neumayer & Plümper, 2007). A woman's socioeconomic status also tends to be correlated with her ability to own and access resources, such as physical property, which is generally associated with greater resilience in the face of disaster impacts and recovery (Enarson, 2007; Enarson, 1999; Juran, 2012; UNWomen, 2017; Valerio, 2014). This finding is especially pertinent to this study, as women with more access to these resources are less likely to rely on emergency shelter for support should a disaster occur. Inequities that may go unnoticed are suddenly glaringly obvious when faced with the harsh reality of the aftermath, such as a disproportionate mortality

rate resulting from a socially constructed gender role. Disasters can serve as a rather unfortunate mirror of society, reflecting the reality of society's systems and their beliefs.

The discrepancies amplify between men and women regarding access to essential resources (i.e., such as education, property, income, and healthcare). This gap can act as a barrier to an individual to be more resilient to the resulting physical, social and economic impacts following a disaster (Juran, 2012, p.6). Men typically have more access to economic means, education, and diversified resources and are usually the majority of decision-makers of most households, communities, response agencies, and governments (Spain, 2001; Juran, 2012; Valerio, 2014). These resources also tend to have a spatial relationship. To gain economic means, one must somehow be present in the public space. Reasons for this could be a job, go to a bank, and even build social capital to leverage for economic gain via outings into public gatherings areas. Education is similar, requiring both economic means and time to attend to the studies. Then there are the more 'private' and intimate aspects of daily life such as childcare, reproduction, and the care and maintenance of the home, placing women in private spaces that coincide with these roles. These resources become increasingly more challenging to build when taking care of children and dependents in the home. Most women's daily activities physically tether them to home (Spain, 2001). Disasters draw our attention to just how problematic this spatial limitation is, in rather unforgiving ways. For example, during the Indian Ocean Tsunami in 2007, Rigg et al. (2008) found that women were primarily located in the homes, caring for vulnerable children and elderly individuals while men worked on fishing boats. When the tsunami struck, many women struggled to get to safety due to their proximity to the hazard, lack

of knowledge around swimming, clothing, responsibilities of care, and lack of awareness of the imminent hazard via early warning systems. Some communities reported a mortality ratio as high as 4:1 between women and men (Rigg et al., 2008, p.142). The spatial relationships and the activities and resources (or lack thereof) connected to the home provide critical insights into why women might be disadvantaged (UN Women, 2017; Hirani et al., 2019; Spain, 2016; Enarson et al., 2007; Chaudhary et al., 2017). Applying that insight to how emergency managers plan, organize and operate shelters would help identify the gaps for effectively supporting women in these built environments.

Several gaps continue to appear even now in planning for mass sheltering. Women regularly complain about a lack of privacy, security, access to bathing facilities, water, food, and adequate reproductive health support (Juran, 2012; Chaudhary et al., 2017; Saito, 2014; Hirani et al., 2019; Valerio, 2014; Martino et al., 2020). Many of these specific needs relate to private spaces, such as the bedroom, kitchen, and bathroom. Much like the private aspects of these spaces' uses, the public discourse around reproductive health topics, for example, are not top of mind, nor are they well researched and understood (Hirani et al., 2019). Also, the realm of planning at high levels tends to be male-dominated, leading to unconscious biases or decision-making gaps (Martino et al., 2020; UN Women, 2017; Reid, 2010). Our physical environment will reflect the socio-cultural norms and values that we prioritize as a society. Thus, society's pre-disaster inequities seep into our response and recovery efforts, resulting in a lack of adequate support for specific demographics' differing needs. The inequities experienced in day-to-day society exemplify this lack of support manifesting in disaster and emergency

management approaches. Enarson et al. (2007) asserted that "disaster vulnerability cannot be understood outside of patriarchy and historical dynamics of global capitalism and colonialism still shaping the developing world today" (Enarson et al., 2007, p. 132; see also Valerio, 2014). This research project seeks to clarify where these patriarchal constructs might occur in emergency shelters and how they might create a spatial syntax that influences the architectural body of those occupying these spaces.

Temporary mass sheltering demonstrates the current understanding of modern society's essential components of a safe and supported space. It is a micro-scale example of our macro-scale urban environment. In studying aspects of what is required to be present in an emergency shelter, the degree to which societal norms inform decision-making becomes clear: gender roles and patriarchal influences that may be playing a role in day to day living will manifest likely in the floorplans of the shelter (Gins & Arakawa, 2002; Spain, 2016; Nguyen & Van Nes, 2013).

Space & Gendered Violence

Throughout the various waves of feminism, space played a pivotal role in combating gender-based violence. There may be a gendered division in the care and occupation of space, and property ownership is ultimately a 'public' affair. Thus, control of the private domain would land with men, despite care falling to women. These constructs can then manifest metaphorically on a smaller scale on individuals' bodies, with men being the owner and women the owned (Sweet & Ortiz-Escalante, 2015). When dispossessed of their 'public' role, men might turn to women to release their frustration, potentially rectifying their sense of emasculation through

verbal, physical, or sexual abuse (Spain, 2016; Valerio, 2014; Juran, 2012). Spain (2016) noted that "privacy operates as a mask for inequality, protecting male violence against women" (p. 148). The prevalence and increase of domestic violence rates tend to be higher in areas with destabilized economies, governments, and social fabrics (Felten-Biermann, 2006 as cited in Juran, 2012; Sweet & Ortiz-Escalante, 2015; Spain, 2016; UN Women, 2017; Valerio, 2014; Martino et al., 2020).

Broken and unstable public spaces lead to private spaces becoming less secure; "under such circumstances, gender-based prejudices, patriarchal values, and behavior patterns are likely to gain new vigor and scope" (Acar & Ege, 2001, see also Villarreal & Meyer, 2019, p. 286). In the first wave of feminism, women-friendly spaces provided spaces for those who needed safety from domestic violence (Spain, 2016). At the time, these spaces were only in residences. Second-wave feminism then pushed women's spatial presence beyond the home. It was a way for women to push back against many barriers to equality that still existed in either physical or conceptual ways in their day-to-day lives (Martino et al., 2020). These findings regarding the evolution of women shifting their relationship to space to shift the confines of the gender norms can help understand how men and women relate to public space differently.

Nguyen and Van Nes (2013) revealed that women more consistently preferred streetscapes that involved more urban integration of various uses but only during hours with public use. Once shops closed, women's presence dropped significantly. Also, streets empty of people and singular in their use were explicitly avoided. To illustrate what this may look like, consider the downtown center of a major urban city. There are usually various shops, restaurants,

hotels, offices, and even apartments. There are usually many people milling around or at least able to see the street and sidewalks. With eyes all around and an environment that encourages people to gather, women are comfortable navigating the area as long as everything is open (Nguyen & Van Nes, 2013). A singular use road would be a low-density residential street or an industrial area where there is one type of use and fewer people moving through the spaces. They might be quieter and darker as a result of the lower occupation of the spaces as well. Women make a point to specifically avoid being out alone in these areas where possible (Nguyen & Van Nes, 2013). Decisions made around our public spaces result in a consistent sentiment among women that it is not entirely safe if set up in a certain way. When women do not feel safe, informal social support systems alleviate that sentiment, usually relying on increased numbers and the men present in that dynamic (Cobbina et al., 2008; Reid, 2010). For example, Cobbina et al. (2008) noted that young urban African-American women all felt safest either in the company of family or in their own private spaces. These women cite physiological disadvantages compared to their male counterparts (i.e., strength, stature) and socioeconomic reliability as the rationale for their increased sense of security. A lack of perceived physical security experienced by women in society can be a cage that keeps women in specific societally deemed acceptable dynamics in day-to-day life (Cobbina et al., 2008).

When examining this situation in the context of disasters, the same patterns emerge. Felten-Biermann (2006) stated that "sexualized violence increases during the phases of instability, and breakdown of social structures immediately following disaster" (p. 83). Again, *place* matters. Disasters invariably disrupt impacted individuals' relationship to their

environment in some capacity, be it via removal, destruction, economic access, or sociopolitical structures. Covid-19 exposed this severity, where gender-based violence rates soared by 35% (Vall, 2019, p. 3). While no physical change to the space itself may have happened to the private space, there was a significant change in its occupation. Women were at more risk for domestic violence, restricted to private spaces with more occupants, potentially a lack of resources and support (i.e., childcare), mixed with potentially increased stress within the home from all the changes, the hazard, job loss, and possibly even loss of life. There were also significant disruptions to our public space and its constructs (i.e., employment, economy) due to the hazard Covid-19, removing it as an option for women to seek some reprieve (Vall, 2019). This trend proves to be true for women throughout various disaster events. Access to services that attempt to address childcare and care for dependents tends to be removed or compromised as options. Doing so leaves women with greater exposure to further fragmentation of their daily lives and potential collateral impacts (Martino et al., 2020; Vall, 2020; Valerio, 2014). Recognizing how disruptions to the use and access of public and private spaces impact women can provide insights into building out emergency shelters to reduce the barriers to meeting their unique needs following a disaster more effectively.

In emergency shelters, strangers must reside in tight spaces where amenities loosely resemble what may have existed in individuals' homes (i.e., sleeping areas, bathrooms) (Juran, 2012). The divide between public and private is blurred—private uses of space move into a facility designed as a public space, such as a stadium. Many women occupying these environments have little privacy (Saito, 2014; Marsh et al., 2006; Juran, 2012). Women try to

mitigate the risks they perceive in shelters in much the same way they do in public spaces, such as "walking in pairs...to ward off harassment from men" (Sarma et al., as cited in Juran, 2012, p. 18). Unfortunately, this is not enough. Gender-based violence occurs throughout the facilities--in bathrooms, bathing areas, dark areas, even in sleeping areas between partners (Juran, 2012; Hirani et al., 2019; Marsh et al., 2006). As noted above, integrating various spaces and their diverse functions fosters a sense of safety among women in public spaces (Nguyen & Van Nes, 2013, p. 171).

Emergency shelters repurposing a pre-existing, publicly oriented space with an underlying singular function driving its design, such as the Caesar's Superdome in New Orleans, could then run into unforeseen circumstances (Nguyen & Van Nes, 2013). Essential resources could be in more isolated areas (public/private divide). An example would be bathrooms separated from newly programmed sleeping spaces by long, unattended corridors. In many cases, reported rapes happened where there was a lack of sufficient lighting or separation from the larger group to access amenities (Saito, 2014). Morenoff et al. (2001) stated that "criminal events require the intersection in time and space of three elements: motivated offenders, suitable targets and the absence of capable guardians" (p. 521). This project looks at how emergency shelters might be replicating circumstances that result in women experiencing higher rates of gender-based violence.

Constructing Women-Friendly Space

A general sentiment noted among women is that attending a public emergency shelter should not be done unless vital. The primary reason women felt this way was a concern for their

safety, specifically the increased risk of sexual assault (Farmer et al., 2018). A vital component of improving how emergency managers address this perceived concern about safety will be gender-mainstreamed policies, practices, programs, and access to resources (Eklund & Tellier, 2012; Lidewij, 2013). Ensuring that women are involved in the conversation is an essential first step (UNWomen, 2017; Valerio, 2014; Juran, 2012). Vall (2020) noted that during the early months of the COVID-19 response in Canada, the overall presence of women consistently hit a glass ceiling of roughly 30% when looking at those in positions of leadership and critical decision-makers. By most counts, Canada is relatively progressive on the world stage in gender equality. However, in 2020, female representation in government had only just reached the bottom end of the required ratio of women needed to note their influence in decision-making (p. 5). Women in planning, logistics, and operations must have an equal voice (Shah, 2012; UN Women, 2017; UNISDR, 2015). Martino et al. (2020) stated that in policy, "the way gender and violence are inadequately referenced, or ignored reinforces and legitimizes the invisibility of women and care in planning dis-course" (p.6). Women consistently lament a lack of basic amenities such as a lack of privacy, laundry, bathing facilities, bathrooms, child care, reproductive health services and supplies, female staff - doctors, security, shelter management, and childcare support missed, overlooked, or dismissed in emergency shelters (Hirani et al., 2019; UN Women, 2017; Marsh et al., 2006; Martino et al., 2020; Valerio, 2014; Hilhorst, 2018; Juran, 2012; Saito, 2014; Enarson, 1999; Rumbach et al., 2016).

First-wave feminism marked the beginning of residences for those who needed emergency shelter from domestic violence in the late 19th century. Many shelters developed into

small communities where women shared childcare responsibilities, learned new skills and built connections (Spain, 2016). Spain (2016) noted that women-only spaces are potent tools in empowering and supporting women's needs, as long as segregation is not required and women can voluntarily access them as needed. Chaudhary et al. (2017) stated that establishing safe spaces for women to have their reproductive health needs met and seek solace in the company of other women should be a priority. Approximately 4 percent of the women occupying emergency shelters will likely be pregnant (Valerio, 2014, p. 151). Even basic reproductive health needs, such as sanitary napkins, are often overlooked when planning emergency shelters following a disaster (Juran, 2012). In addition to women's biological reproductive role, they are often the primary caretaker for children and vulnerable family members. Women have noted difficulty or a lack of access to resources and privacy to care for members. For example, reproductive health and care needs such as women who have to nurse young ones may be challenging to manage in emergency shelters if not considered. Existing patriarchal concepts of women's bodies "as objects, especially sexual objects, or as victims, disempowered, inferior; not as subjects, protagonists or social agents with power" (Sweet & Ortiz-Escalante, 2015, p. 1829) creates limitations to women exposing parts of their body in public spaces. Exposing themselves in this way may be interpreted to be indecent, inappropriate, or misconstrued as an invitation for sexual advances due to these socio-cultural patriarchal beliefs (Wies & Haldane, 2011). These limitations can unnecessarily create additional stress and risk for women attempting to navigate these environments. Corotis and Enarson (2011) argued that an essential piece of a community's ability to reconstruct the social fabric of their lives is most likely a community facility organized,

managed, and occupied by only women. The lack of reproductive health support, child care, women's presence in response agencies, and decision-making capacity has been noted as a consistently recurring gap in disaster sheltering efforts and pointed to as factors increasing women's exposure to gender-based violence in these spaces (Marsh et al., 2006; Valerio, 2014; Juran, 2012; Hirani et al., 2019).

Failures to consider gender-based needs equitably contribute to what Wies and Haldane (2011) point to as "structural violence," which is to say that our systems, processes, and social norms are what decides the individuals who are the most exposed to the risk of violence against them, and those that will likely escape accountability for the act. Wies and Haldane (2011) argue that supporting women adequately requires considering their social and biological needs. The planning and use of spaces provide an opportunity to explore the idea of "social + biological = Whole Woman" (Wies & Haldane, 2011, p.22). Doing so can draw more attention to the uses and functions that are missing when bringing private spaces into public spaces. Therefore, the noted gaps in emergency shelter spaces can feed into barriers to women's comfort and exertion of socioeconomic capacity in public spaces.

In the literature, success is experienced both in communities and in times of crisis when employing women-only enforcement agents and creating capacity for women to participate and contribute in recovery phases. These types of actions empower women as agents of change as opposed to victims, with these attitudes potentially carrying over into systematic changes within the community's underlying social constructs (Valerio, 2014; UN Women, 2017; Martino et al., 2020; Cupples, 2007; Eklund & Tellier, 2012; Reid, 2010; Lidewij, 2013). These practices all

challenge existing social constructs, specifically in space. Emergency managers say that practices that leverage women have value, as women-friendly "spatial practices can be practices of resistance" (Pain, 2001, p. 904) in the face of underlying patriarchal values.

This research project examines critical elements of a woman-friendly space to understand better how spatial programming in emergency shelters may be employing these empowering practices or a lack thereof. Gins and Arakawa (2002) noted that our constructed physical environment is a sort of physically constructed conversation, that is to say:

an Architectural procedure resembles its predecessor, a word, in two respects for a start: First, it is a repeatable item that readily lends itself to discursive use; second, charged with conveying a specific experience or range of experiences, it can be evaluated as to how well it serves its purpose or how effectively it has been put to use. (p. 57)

Essentially, an architectural procedure is a notion that buildings are a physical representation of how a society may speak about a particular subject. Consider, for example, a church. Churches are spiritual sanctuaries, a physical symbol of human reverence for something divine. When entering any such space, there are consistencies in the construction of such spaces. For example, a church usually has natural light, unique acoustics, and exceptionally high ceilings. Observing how society builds its spiritual spaces aligns with how spiritual texts speak about their divinity or divinities. With this theory in mind, the literature can point to the social discourse in shelter practices as they have spatially manifested (or not). Based on this data, there may be more specific heuristic tools for emergency shelters to employ that can change trends with gender-based violence following a disaster. Unfortunately, due to the site-specific nature of

design, a template of 'women-friendly space' is not available; each site, building, and internal space will have unique factors. Therefore, making something systematically applicable is challenging.

Depending on the findings, this project aims to provide specific best practices for spatial configurations in emergency shelter plans. By coding diction describing the architectural surroundings, a greater awareness of the features of problematic spaces can be better understood (i.e., bathroom facilities, lighting, travel distance). It draws from the concept of the "architectural body" (Gins & Arakawa, 2002, p. 64), which refers to the integration of actions and prompted behaviors of an organism concerning the surroundings that it finds itself occupying. The cases will help highlight these indicators via paying particular attention to the descriptions of space correlated with higher instances of gender-based violence, women's increased fear of violent crime, and lack of security.

Emergency Management Shelter Standards: 'To be or not to be' equitable?

Understanding how these ideas are reflected in Disaster & Emergency practice today requires examining how they manifest in our current standards of practice. These documents are the guideposts for practitioners. In much the same way that laws help to identify the values of a society, the components highlighted and discussed in common standards of practice reveal the priorities of a body of practice.

The United Nations and the Red Cross are significant players in international disaster response efforts on the international stage. When looking at these groups, both refer to *The Sphere Handbook: Humanitarian Charter and Minimum Standards in Humanitarian Response*

(2018). Sphere was founded in 1997 by many non-government organizations that partnered with the Red Cross and Red Crescent to consolidate knowledge and practices to support the effective response to humanitarian crises. This standard has been regularly updated throughout the decades to incorporate practical lessons learned and new evidence in relevant fields. In the most recent edition, women and girls are specifically mentioned in each chapter and consistently identified as an at-risk group in the four core areas of focus: Water, Supply, Sanitation, and Hygiene Promotion; Food Security and Nutrition; Shelter and Settlement; and Health (Sphere, 2018). Themes highlighted in the research regarding protection from violence are reiterated here, including the need for engaging women and girls in the emergency management planning processes, including the shelter design, location, tools for additional privacy, hygiene, and reproductive health needs.

In addition to functions, an essential skill of those operating the shelter was: “ensuring staff know how to refer any protection concerns around domestic violence or abuse, violence, exploitation or neglect of children,” as a vital resource to those who may need additional support to maintain their safety and sense of security (p. 256). Pre-existing societal hierarchies and systems are the root cause that generates the lack of equity between men and women, which may be the root cause of gender-based violence against women and girls (Sphere, 2018; Enarson, 2011; Valerio, 2014; UNWomen, 2017). By acknowledging that these social hierarchies exist, it is possible to dismantle them through awareness and adequate support for those attempting to navigate some of the darker outputs of these socially constructed inequities.

What is fascinating is that the *American Red Cross Sheltering Handbook* (2012), while referring to Sphere, does not appear to layer the gender lens throughout the recommendations very thoroughly. There are defined areas with specific functions (sleep, childcare, health, etc.) they recommend be in the emergency shelter. However, the only noted space that is gender-specific is a private space for breastfeeding. Outside of this, women are only mentioned twice in the document regarding the dormitory area set up and the separation of single men and women. Any reference to children concerns a family unit. How this may be adapted if needed is unclear. *The 2017 FEMA Field Guide* is similar, though without the space for breastfeeding. The main difference is that FEMA included a sample floor plan for those setting up and operating a shelter. This floorplan is undoubtedly a helpful tool. It may foster a holistic understanding of the spaces as they work together and flag potential issues for safety or gaps in use. However, it may also be detrimental. Looking at the FEMA drawing, there is a clear public/private divide. The sleeping area is in the larger assembly area. The surrounding uses support more personal needs (hygiene, mental health supports, childcare) in the smaller surrounding rooms that offshoot longer corridors. There is no staff space integration; instead, the staff spaces are in one area opposite the public sleeping area. What is more, the guide recommends separating single men and women in the sleeping area. This recommendation is likely more conceptually accomplished based on the arrangement of the sleeping materials than an actual physical separation: the large assembly area in the plan does not delineate specifics. It is simply a homogenous square with a single label on it.

Richter and Flowers (2010) noted that disaster and emergency management sheltering practices tended to treat most spaces in a relatively uniform way, with the intent of being gender-neutral. Researchers have referred to this as gender-blind (Enarson & Fordham, 2010; Lindsay, 2003). Thinking about needs in such a way runs the risk of disregarding the complex needs of those using the facilities adequately. What is interesting is to see the simplification of materials as one moves from the high-level strategic considerations to the operational implementation tools. The *Sphere (2018)* standards are a richly laden text of gender dimensions. Nevertheless, both the FEMA and Red Cross guides have only two or three words referencing gender variation. Given time constraints in a disaster, reading the *Sphere (2018)* standards and then translating the high-level material into implementation materials while managing the many balls in the air is unlikely. It is well over 300 pages and does not provide a clear and concise ‘how-to’ direction. This issue with length and accessible resources is applicable within planning contexts; practitioners usually work with limited time, resources, and skillsets, especially at the local level where implementation happens. The function of these documents is inherently different, but that should not mean that efficiency precludes inclusivity. This project looks at how to understand better the manifestations of gender considerations that may or may not be happening through discussions with practitioners. The discussions help to recognize other tools practitioners may leverage and understand what might be the best mechanism to move the gender-mainstreamed discussion in standards such as *Sphere (2018)* into more the practical resources used for implementation.

Summary

In exploring the literature and examining the complex needs of individuals when considering emergency shelters, the depth of potential gender biases in society's physical environment becomes apparent. This literature review provides a solid foundation to allow for a combination of a deductive and inductive analytical framework to the data that follows in the case study by identifying vital underlying patterns in the literature (Feraday & Muir-Cochrane, 2006; Yin, 2018). The theoretical lens applied to this data combines social constructivist and feminist perspectives with the fundamental perspective that society constructs the roles assigned to specific genders and not due to biological attributes. In addition, there was an underlying assumption that recovery is only equitably achieved once society integrates the diverse gender needs into our environments and decision-making (Auerbach & Silverstein, 2003). The critical component of this lens is that it considers the construction of society's practices. This consideration includes how the urban environment is built directly from what is believed, assumed, and omitted from socio-cultural conversations. This lens was established for this particular research project through the literature review to provide transparent and clear insight into the interpretation of the data (Yin, 2018; Creswell & Creswell, 2018; Auerbach & Silverstein, 2003). In doing so, this project explores how the integrated nature of the patterns identified in the literature review, via a social constructivist and feminist perspective, might manifest in emergency mass shelters. The examination happens via a structured study of two events that relied on mass sheltering in public facilities to maintain the life safety of citizens fleeing overland flooding.

Chapter 3: Methodology

The research sought to identify if and what shelter practices may inadvertently increase women's exposure to risk when seeking refuge in emergency mass shelters following a disaster event. The approaches used included an instrumental multiple-case study. The case study is composed of two cases, which aimed to "provide insight into a particular issue, redraw generalizations, or build theory...facilitat[ing] understanding of something else" (Mills et al., 2010, p. 475). Yin (2018) also notes that a case study could be "an empirical method that...

- Investigates a contemporary phenomenon (the "case") in depth and within its real-world context, especially when
- The boundaries between phenomenon and context may not be clearly evident." (p.15)

This research project examined how gender may be influencing physical spaces. The findings yielded potential strategies and practices that may mitigate violence against women, as various factors can influence the construction, navigation, and interpretation of space. Given the exploratory nature of this project, the case study methodology creates a structure to examine the similarities and variances of the events within the context of the literature review. The two cases are the Southern Alberta Floods (2013) in Calgary, Alberta, and Hurricane Katrina (2005) in New Orleans, LA. This methodology seeks to address this primary question: can spatial programming in emergency shelters that considers gendered experiences of space serve to decrease women's and girls' exposure to potential incidences of gender-based violence? In addition to this overarching research question, there are vital sub-questions that this study examines as well:

- How do existing standards and practices consider gender when planning and operating spaces in emergency shelters?
- Do practitioners consider space and its ability to affect behavior in emergency shelters? If so, how?
- What are some of the ways women use space differently than men? How is this accommodated in practice and during events?
- Are there any aspects of the physical environment noted in the research that may prime individuals to perpetrate gender-based violence against women

The two chosen events presented opportunities to address these questions based on similar hazard events and the following mass evacuations. A desk study of peer-reviewed and grey literature released from reputable government and community agencies (e.g., YWCA) was conducted for each case to understand the disaster event and the impacts on those communities. Having established the cases with literature, semi-structured interviews with practitioners in relevant fields, identified through the research, provided data to inform the study further. Using two streams of data allowed for shelter practices' theoretical and practical applications to be addressed, analyzed, and synthesized, and provided plausibly practical implications for practice (Creswell & Creswell, 2018; Yin & Campbell, 2018; Huang, 2010). The context understood in the literature for both cases helped more strategically inform the semi-structured interviews (Yin, 2018; Auberstein & Silverstein, 2003).

Cases

The two focus events within the case study will be the Southern Alberta Floods (2013) in Calgary, Alberta, and Hurricane Katrina (2005) in New Orleans, LA. Both of these events had a significant impact on national, regional, and local agencies. They each had mass evacuations and mass sheltering when confronted with a similar hazard: overland flooding. However, the communities also had significant variances: the scale of the evacuations, the areas affected, the social significance and implications, and those that required shelter, to name a few. The pre-existing socio-economic, political, and cultural vulnerabilities that shape the two communities may change the construction of physical spaces, the use of spaces, and the users. The diversity in vulnerability may help shed some light on intersectional vulnerability, which may not come to light if only examining one case and community. For example, New Orleans has different ethnic demographics and history tied to specific groups unique to the United States. Calgary has various ethnic demographics but with a different history. There were also different uses of the urban areas primarily impacted. Yin (2018) spoke to the advantage of multiple-case study designs is the capacity to note the divergent factors and converge the data. Doing so helps foster a better understanding of the issue in question and how it manifests differently with changes to the surrounding contexts (Yin, 2018).

Due to the events' timeframe, research and grey literature were available for each of the two events. Therefore, the hazards were high risk to both locations. In addition, there were similar types of hazard impacts to the sites (i.e., overland flooding) (Yin, 2018; Creswell & Creswell, 2018). The following sections describe each case in greater detail. The factors

contributing to the severity of the event's experience and emergency sheltering in the research are factored into the interviews' findings to inform the recommendations.

Case 1: Southern Alberta Floods, 2013 in Calgary, Alberta, Canada

In June 2013, significant precipitation events in Southern Alberta set off a cascade of events that overwhelmed the existing rivers' shores, resulting in one of the costliest events in Canadian history. It impacted approximately 55,000 square kilometers, including 30 communities, and thousands of individuals were directly affected (Sahni et al., 2016). The floodwaters inundated an estimated 14,500 homes, and approximately 100,000 people had to evacuate. There were also five lives lost in the immediate aftermath (Government of Alberta, 2014). In addition, there were over 1.7 billion in insurable losses and approximately 6 billion in recovery costs (City of Calgary, 2018). The 2013 Southern Alberta floods laid bare Calgary's complex human dimensions and systemic inequities, as disasters often do.

Calgary is the largest municipality impacted among these communities, with more than 75,000 residents required to evacuate and seek emergency shelter. Of that 75,000, the floods displaced roughly 2,000 of Calgary's most vulnerable individuals from existing emergency and transitional shelters (i.e., YWCA). Many of these individuals were already struggling with various intersections of vulnerability in their daily lives, such as addictions, homelessness, women escaping domestic violence, and mental health issues (Dozois, 2014). This event triggered the most significant urban evacuation that had occurred in Canada up until that point. Despite previous experience with flooding, Calgary had not seen an event of comparable

magnitude since 1890 (Haney & Gray-Scholz, 2014; Tanner & Arvai, 2018; Calgary Emergency Management Agency, 2018).

Following the flood, the social services sector was overwhelmed with citizens needing support due to the impacts and losses caused by the disaster. Dozois (2014) found that despite disruptions to their resources due to funding reallocations, these agencies' support to vulnerable Calgarians experienced a 400% increase in demand for their services. As a result, the impacts and needs of vulnerable populations in Calgary escalated quickly. With that, so too did gender-based violence. Sahni et al. (2016) completed an overview of the impacts to public health in various dimensions: sexual assault-related emergency visits in Calgary had tripled compared to past years. A combination of entrenched and intersecting factors makes Calgary's women more vulnerable following a disaster event, specifically to gender-based violence. The Southern Alberta Floods in 2013 was yet another disaster event reflecting this trend. To better comprehend why the impacts were felt to the degree that they were, it is helpful to understand where Calgary stood before the event and the cracks in its foundation (Wisner et al., 2003).

Before the 2013 flood impacted Calgary, the city was already in the process of navigating recovery from the 2008-2009 recession. Approximately 9.7 % of Calgarians fell within the low-income bracket (United Way, 2014). On average, households shouldered significant debt loads compared to their other Canadian counterparts (United Way, 2014). Calgary's housing market was already challenging for most to navigate. With an exceedingly low vacancy rate that dropped to essentially zero following the flood, many individuals and families had to find new shelter options (Lammiman, 2019). Despite the GDP expecting promising growth in the spring

of 2013, unemployment rates continued to increase, more keenly felt by women and immigrants. This trend was notable given that 30% of Calgary's population self-identified as a visible minority, and women made up approximately 30% of those experiencing homelessness (City of Calgary, 2012; City of Calgary, 2013; see also Lammiman, 2019). A key influence for many factors was the intersectional and embedded social norms and legislative discrimination tied to political leanings that ran deep in Alberta's history for several decades (Clément, 2013; see also Lammiman, 2019).

Calgary's population had recently seen significant growth, and as a result, rapid urbanization (City of Calgary, 2012; Calgary Emergency Management Agency, 2018). Rapid urbanization does not often allow enough time to properly engage different demographics and stakeholders, especially marginalized populations (Kaner et al., 2014; Arup, n.d.). This exclusion can significantly impact a community's ability to build sustainable cohesion due to a potential lack of equity in accessibility, social support services, and resource distribution. When communities proliferate, some may be left behind or excluded from conversations around how to build out the type of urban environment that supports their needs. Thus, an environment that those who participated in the planning processes may be considered safe could result in those omitted feeling unsafe. For example, with women, many take note of well-lit and heavily populated areas and avoid those lacking these features as they do not feel safe (Nguyen & Van Nes, 2013). These considerations may not be something that is immediately thought of if the decision-makers are all men. Depending on how individuals interpret queues from their environments, things that may seem fine to one person may not suit another. There is a greater

likelihood that those omitted from development conversations may also, due to increased discomfort in day-to-day movements, have an increased vulnerability to the severe impacts of disaster events (Kaner et al., 2014; Wisner et al., 2003; Valerio, 2014).

In Canada, women are more likely to be vulnerable to physical or sexual violence. In 2002, women accounted for roughly half of the victims of reported violent crimes and an estimated 85% of sexual offenses (Cotter & Savage, 2019). By 2008, women accounted for 92% of reported sexual offenses (Statistics Canada, 2014; see also Canadian Women's Foundation, n.d.). Between 2009-2013, rates of sexual assault, where the perpetrator was an intimate partner, rose by 17% (Statistics Canada, 2015, p. 31; see also Canadian Woman's Foundation, n.d.). In 2014, "women self-reported 553,000 sexual assaults", a rate almost seven times greater than their Canadian male counterparts. In addition, an estimated 70% of spousal domestic violence incidents go unreported, with the majority of victims in these reports being women (Statistics Canada, 2014).

Before the flood event, gender-based violence was already a significant issue in Alberta. For example, Esina et al. (2013) noted that in 2012 when surveying 900 Albertans about the presence of domestic violence in their neighborhoods, only 5% believed it did not occur in their communities. Also, nearly 50% voiced that they were aware of some form of violence occurring (Esina et al., 2013). In addition, the Canadian Women's Foundation completed a study that found that approximately 67% of Canadians know a woman who has experienced physical or sexual gender-based abuse. Alberta, unfortunately, exceeded this number with a 74% incidence rate, based on what was reported (Esina et al., 2013).

Case 2: Hurricane Katrina (2005) in New Orleans, LA, United States of America

On August 29, 2005, Hurricane Katrina made landfall on the Southern Coast of the United States, particularly impacting Alabama, Louisiana, and Mississippi. The Mayor and Governor had called for the evacuation of New Orleans the morning of August 28, and roughly 80% of New Orleans residents heeded the warning. However, more than 100,000 people did not, or could not, heed this warning and remained in their homes. The majority of those left in the city were elderly and African-American populations: lower-income, living in the highly vulnerable areas of the city (i.e., 9th Ward), and they generally did not own vehicles (Thornton & Voight, 2007). This storm was a category three storm when it made landfall and resulted in a catastrophe caused by multiple social, technological, and environmental systems (Pardee, 2014). In addition, Thornton and Voight (2007) noted that:

What was unique about Katrina was the fact that it represented a multi-impact series of catastrophic events, comprised of the impact of Hurricane Katrina, the breach of several levees in the city and subsequent flooding, a significant oil spill, a chemical storage facility explosion, [and] a complete breakdown of law and order for several days... (p.25)

In less than 24 hours, roughly 80 % of New Orleans was underwater. The Superdome was a desperate solution to a need for shelter, meant to act as a means of enabling survival in the face of the immediate hazards (Nigg et al., 2006). At least 9,000 people initially found themselves bused to the Superdome; 3,000 others were in 45 surrounding shelter locations; and as of September 1, roughly 25,000 people were sheltering at the Morial Convention Center. After the

storm made landfall, the situation worsened with the subsequent failure of the levees. The next day, the Superdome and Morial Convention Center became the shelters for an additional 38,000 people (Nigg et al., 2006). That day, the New Orleans Police Department (NOPD) sent roughly 88 police officers to wrangle the desperate crowds and were utterly overwhelmed (Nigg et al., 2006; Thornton & Voight, 2007). However, the NOPD's resources were limited and severely compromised, with radio batteries dying. In addition, their main district office flooded, and reduced staffing left them unable to evacuate stranded locals (Brezina & Kaufmann, 2008). Over two weeks following the initial landfall of Hurricane Katrina, an estimated 600 shelters were in place to support at least 200,000 evacuees in at least 18 states (Callaghan et al., 2007, p. 308). On September 2, the government deployed the National Guard, and 1000 troops arrived on the scene at the Superdome to start transporting evacuees to other shelters in Houston, TX, days later. Between the chaos on the ground, the chaos reported (and refuted), and the inefficiencies happening in the response due to conflicts happening at different levels of government and between agencies, New Orleans quickly began to transform "into a vast refugee camp" with a "social milieu ...described by some as a 'wild west'" (Thornton & Voight, 2007, pp. 36-7). Moreover, significant and disproportionate impacts on the impoverished 9th Ward city highlighted this event's deeply entrenched, disproportionate, and intersectional racial dimensions.

Before this event, New Orleans was a popular tourist destination for its homegrown cultural anarchy and is known to be "a place of murky beginnings and shady history." Hence, many flocked to the area to enjoy the unique and edgy experience (Simmons & Casper, 2012). Despite its reputation as a unique travel experience for visitors, New Orleans was in a difficult

economic situation. Just shy of 25% of locals fell below the poverty line. The median household income was approximately 34% less than the national median of \$46,242 (Fussell, 2007). In the 1950s and 1960s, there was a significant movement to desegregate the region. The city's population growth had slowed since 1960. The demographics rapidly shifted in the 1980s to a nearly equal division of Caucasian and African American residents. The majority of African American residents in New Orleans at that time were far below even the local median income levels. In the 1990s, crime waves rolled across the city, and it was known as the murder capital of the nation (Simmons & Casper, 2012). Housing costs were also unattainable for most, resulting in a positive feedback loop of poverty. Fair-market rent prices for a three-bedroom unit equated to "335% of what a full-time, minimum-wage worker earned in 2002" and skyrocketed by 35% in the year following Hurricane Katrina due to demand (Pardee, 2014, p. 21). This economic situation with affordable housing created patterns for how the construction of the urban environment in New Orleans unfolds.

Place-based poverty was a feature of this city. This inequity manifested as a lack of access to resources, jobs, transportation, and social support disproportionately unavailable to many who needed them most based purely on their geographic location. Many of those in New Orleans did not, and could not, own a car, and that was a primary reason for the lack of effective evacuation during the event (Nigg, Barnshaw & Torres, 2006; Pardee, 2014; Reid, 2010; Fussell, 2017). Many of the city's most vulnerable populations, the majority of whom were African American, were exposed to the initial physical impacts of the hurricane (Fussell, 2007; Reid, 2010). This disproportionate degree of impact was, in part, caused by the urbanization and

housing development history of New Orleans, which had racial biases entrenched in its origins that persisted for decades (Fussell, 2007; Reid, 2010). Pardee (2014) noted that New Orleans demonstrated similar urban planning patterns as other cities with high poverty rates. Tools that created a more severe form of segregation of racial minorities included "legally sanctioned racial residential discrimination, including blockbusting, redlining, race restrictive covenants, and racial steering" (p. 18). These actions compounded over time and removed African Americans from much of their city's political and planning decisions. The local social and physical infrastructures' maintenance efforts and schedules were also known to be well behind those of the other states in the nation, specifically within the Gulf Coast region (Berke & Campanella, 2006). These factors, coupled with a history of insufficient policies, resulted in a lack of emergency planning and poor development decisions that further exposed residents to local flood hazards (Burby, 2006). This increased risk exposure was especially applicable to women, who had continued to lack equitable access to resources and a seat at the decision-makers table, even in 2004 (IWPR, 2004; UN Women, 2017; Valerio, 2014; Brezina & Kaufman, 2008; Reid, 2010; Jenkins & Phillips, 2008; Pardee, 2014; Thornton & Voight, 2007).

In the United States, there were still many ways women's status was lagging behind their male counterparts. The Institute for Women's Policy Research (IWPR) (2004) noted that women "have not achieved equality with men in any state" (p.1), and women were the poorest in the demographics examined. There were also significant variances between states. For example, women in D.C. showed a 7.6% disparity in their wages compared to their male counterparts, while women in Wyoming experience a 43.7% wage gap (p.3). Reproductive rights, health, and

wellbeing for women were far worse across the board in the United States, with additional barriers and discrimination at play for women of color. Effective 2004, IWPR (2004) ranked Mississippi as the worst state for women. Louisiana is not far behind, noted amongst the six states whose social and economic autonomy indicators (i.e., four or more years of college, health insurance, above the poverty line). African American women in Louisiana also ranked last regarding their incomes, averaging only \$19,400 per annum (IWPR, 2004, p.5) and last in women actively participating in the workforce at 52.1%. New Orleans represented concentrated intersectional vulnerabilities for women that had been built and reinforced for decades.

In many cases, women, especially women of color, represented the most vulnerable in New Orleans. There have been those in the community who had tried to advocate for better housing and infrastructure to support their children and families in public housing areas but to no avail (Reid, 2010; Pardee, 2014). Women accounted for the majority of the population living in public housing areas. Butterbaugh (2005) noted that these women accounted for roughly 80% of those left behind to endure further impacts (p. 17). A number were either alone or left to care for many dependents. With the breakdown of many social agencies, routines, and the actual environment itself, they could no longer rely on their informal support systems (Reid, 2010). Many of these women lived below the poverty line, with African American women in this category earning, on average, just shy of \$20,000 in a year. New Orleans already had high community and gender-based violence rates, concentrated in the areas with the lowest incomes, primarily occupied by African Americans.

During Katrina, the National Sexual Violence Resource Center noted 47 reported rapes. Findings noting that many incidences may not appear on the record due to first responders navigating various immediate life-threatening demands. This trend in unreported violence, coupled with offline jurisdictions, meant that women were frequently unable to report the crime for days to weeks after it had occurred (Thornton & Voight, 2007). Of those officially reported, "31% occurred in evacuation shelters or sites" (p. 25). Though some studies consider the violence exaggerated, those examining the event from a gendered lens note women were a specifically targeted demographic, victimized by violence throughout all stages of the event (Brezina & Kaufman, 2008; Reid, 2010; Jenkins & Phillips, 2008; Pardee, 2014; Thornton & Voight, 2007). Issues with funding models following the event played into this. Many of the financial support applications for those impacted by disaster are built for a nuclear family and assumed the head of the household was male. These attributes were required to receive support. As a result, some women were in a position where they had to choose to return to an abusive partner to secure the funding to support dependents (Jenkins & Phillips, 2008).

Participant Recruitment

The literature review coupled with the established understanding of the two cases informed subsequent semi-structured interviews with specialists in crucial sectors of practice: women's shelters, social work, emergency management, first responders, criminology, psychology, women's health, and urban planning (Wies & Haldane, 2011, Martino et al., 2020; Yin, 2018; Spain, 2016, Townsley, 2009; Nigg et al., 2006; Khan, 2016; Marsh et al., 2006; UN Women, 2017). Having both the insights of the literature and the hands-on perspectives of

practitioners will help bookend what the process may look like in application. The selection criteria for interview participants included sectors that may influence emergency shelters' planning (policies, selecting preferred locations, implementation outlines & strategies), and those on the operations side (set-up, management, logistics, security, health - first aid, emergency medical needs). Participants in the sectors of influence for shelter planning and operations also had some connection to the two chosen cases. Also, to ground the validity of the data provided in the interviews, all participants had a certain amount of experience in their field of practice (Yin, 2018).

The chosen participants received a written email invitation to participate, and those who agreed to take part fell into the professional realms, noted in Table 1:

Table 1

Agencies Sourced for Interview Participants

Agency	Role
Affordable Housing Authority & Owners	Managers, operators, enforcement - security, social services, bylaw officers
Women's shelters	Operators, Counsellors, health practitioners supporting residents, social workers
Emergency Management Agencies (CEMA, AEMA, FEMA, Governor's and New Orleans Office of Homeland Security & Emergency Preparedness, Emergency Medical Services, State Authorities, Emergency Social Services), Red Cross	Planners, shelter operators, first responders
Police Authorities - local to area (Calgary, AB and New Orleans, LA)	Criminologists/analysts familiar with local trends, with shifts in trends during events, police officers

Architecture Firms	Designers
Urban Planning Department	Planners, Planning technicians, policy writers
Social Services	Additional NGOs, public and private sector stakeholders that the research might point to that may only be specific to these events

Following the initial participant recruitment, additional participants came to provide their perspectives. The Snowball-sampling method, meaning a "convenience sample of a few research participants and asking them to select others," supported the efforts in acquiring additional data (Auerbach & Silverstein, 2003, p. 24). Participants referred their peers when they felt that others might have more niche expertise and provide more specific data to answer the questions. This study seeks to refine further the current understanding of the phenomenon of gender-based violence in emergency shelters while identifying potential gaps and barriers to practices on the ground not yet understood.

Ethics

Before any participant recruitment, the project sought approval from the Royal Roads University (RRU) Research Ethics Board (REB). Submitted for consideration were the interview questions (see Appendix 1), a letter of consent (see Appendix 2), and the completed application that outlined the research project. Once approved, the same letter of consent and questions were provided to the participants during the recruitment processes and interviews conducted. These documents were provided to all participants to ensure that each one understood the purpose of the research and the parameters (i.e., time allotment, means, and confidentiality) of the interview.

I am also a practitioner, so many steps were taken to ensure that participants understood that I was conducting these interviews independently as a student at RRU. All references to my professional role at Calgary Emergency Management were omitted from the recruitment and subsequent correspondence. All personal identifiers were kept confidential, including the agencies to which the participants were professionally tied. These measures ensure that their perspectives and insights would not be detrimental to their careers, reputations, or employers. It was made clear in the initial request that participation was entirely voluntary. Before beginning the interview, there was time to review the consent form again, answer any questions, confirm consent to being recorded, and affirm that participation was voluntary. With the participant's permission, interviews were recorded to support accurate transcription; if not, the data were captured with only written notes. Later, a data set of all the amalgamated written notes set the stage for the analysis.

Conducting the Interviews for the Cases

The interviews occurred via the digital communication platform of Microsoft Teams due to the health and safety precautions required for COVID-19. Extensive notes were transcribed during the interviews. Notes were taken during the interview and then reviewed for accuracy if the participant was comfortable recording the conversation. Interviews were approximately 1 hour long and were semi-structured to allow for more exploratory conversation based on aspects the participants felt relevant. These data helped to highlight additional pieces of the problem at hand from the insights of practical experience. Throughout the interview, notes captured the conversation. If the participant permitted recording the session, recording occurred to confirm

the accuracy of these notes for the analysis. Participants, at specific points, also recommended additional grey literature sources to corroborate further their insights and integrate them into the analysis of all the data collected.

Chapter 4: Data Analysis

Using a deductive approach based on the literature review's social constructivist and feminist lenses, critical patterns in the language used when discussing the problem are extracted and developed into narratives (Guest et al., 2012; Feraday & Muir-Cochrane, 2006). The thematic analysis happened in stages, the first of which was transcribing the notes taken during interviews into an anonymized data set. Then, the data was examined and distilled over several iterations, grouped into themes; and then built out into narratives. There were variances in the technical language and jargon used across the disciplines' data. Examples of these variances included referring to forms and processes commonly used during a response, such as those familiar in the Incident Command System or for building assessments. In the interviews, requests for clarification of technical jargon in plain language enabled more consistent analysis and mitigated against potential bias from my interpretation. The chapter will explore data analysis by establishing my role as a researcher, looking at how my background and perspective influenced the research project structure, followed by a brief analysis process.

Researcher Role

My role in this study is to gather and analyze data to understand if spatial programming in emergency shelters can decrease women's and girls' exposure to gender-based violence. I am currently an emergency management practitioner, though most of my previous academic and professional experience is in Architecture and Urban Planning. Johnston (2014) noted, "research is about creating new knowledge and that its development is based on a judgment of what is known and how it is known" (p. 207). Thus my education and experience working in the fields of

architecture, urban planning and emergency management would provide me with a unique perspective, especially when considering the spatial elements of this research project. A common aspect of these professions is the involvement and coordination of multiple stakeholders.

Generally speaking, emergency management, architecture and urban planning navigate problem-solving through coordinating multiple specialists. The integration of multiple streams of thought significantly shaped how I conceptualized this project. In my mind, this approach aligned with my understanding of how to design space. Inputs are required from multiple experts and users, and these inputs then need to be assembled into a cohesive object (e.g., a building).

When considering stakeholders inputs, there also are patterns of execution in design that could be detrimental but entrenched due to the status quo. It is often worthwhile to explore these patterns to understand how the application could be improved to better support the diverse users who may occupy it. As a woman operating in this field of practice, I have had to navigate these primarily male-dominated environments, encountering barriers and assumptions. One goal was to find ways to create better experiences for women who used space and, in turn, better experiences for those who sought to work in these areas' realms professionally. However, these concerns can bias my approach, as I cannot speak to the male perspective or understand the dynamics or potential factors at play. When tackling this project, I wanted to consider how this problem might result from a relational interaction between the two polarities of the gender spectrum. The same reflexivity that I have to apply as a designer to a building (i.e., understanding and adapting various perspectives into a whole) influenced how I tackled and conducted the research problem. There needed to be a willingness to be open to being wrong,

explore other perspectives, and reflect insights. In Architecture and Urban Planning, there is a lot of negotiation, calibration, and integration that must happen. I incorporated these strengths of the observation and multi-sectoral integration of various bodies of thought and experiences to explore this problem uniquely. This research project leverages these skills, biases, and practices to bridge the knowledge gap of the current problem with a unique lens. The findings and recommendations then provide practitioners with new gender-mainstreamed options to consider when adapting spaces for emergency shelters.

Thematic Analysis & Coding

By grouping themes that were identified based on the repetition of ideas and patterns throughout the data collected, the individual pieces of data built from idea, theme, and construct to culminate in an overall theoretical narrative (Yin, 2018; Auerbach & Silverstein, 2003). Table 2 (see below) shows a sample of the initial stages of data analysis of codes extracted from the case data. The raw data and analysis were kept, coded, and distilled manually via OneNote and color-coded as the themes focused. When considering themes, analysis was initially in the context of the questions answered in the interviews. Then, repeated words and concepts were highlighted and carried forward for further analysis.

These themes evolved into narratives by examining patterns between gender, place, and disaster, as shown in Figure 1. The analysis began to shift from deductive to inductive, as there was no robust pre-existing framework to defer to for integrating the bodies of knowledge in this specific way. However, the firm foundation provided by the deductive analysis of the data revealed specific and surprising trends in how participants were discussing the questions. Figure

1 is a photo of the stage in which distilled narratives and their components were all laid out and reorganized by the original interview question that triggered the discussion with the participants. The interview questions slowly built on one another, moving first from citing experience in emergency management to inquiring about humans and relating to space, understanding how gender factors into decision-making, and finally, exploring the aspects that lead to gender-based violence emergency shelters. Data were color-coded to highlight and coordinate trends to unearth novel perspectives regarding the research problem.

Table 2

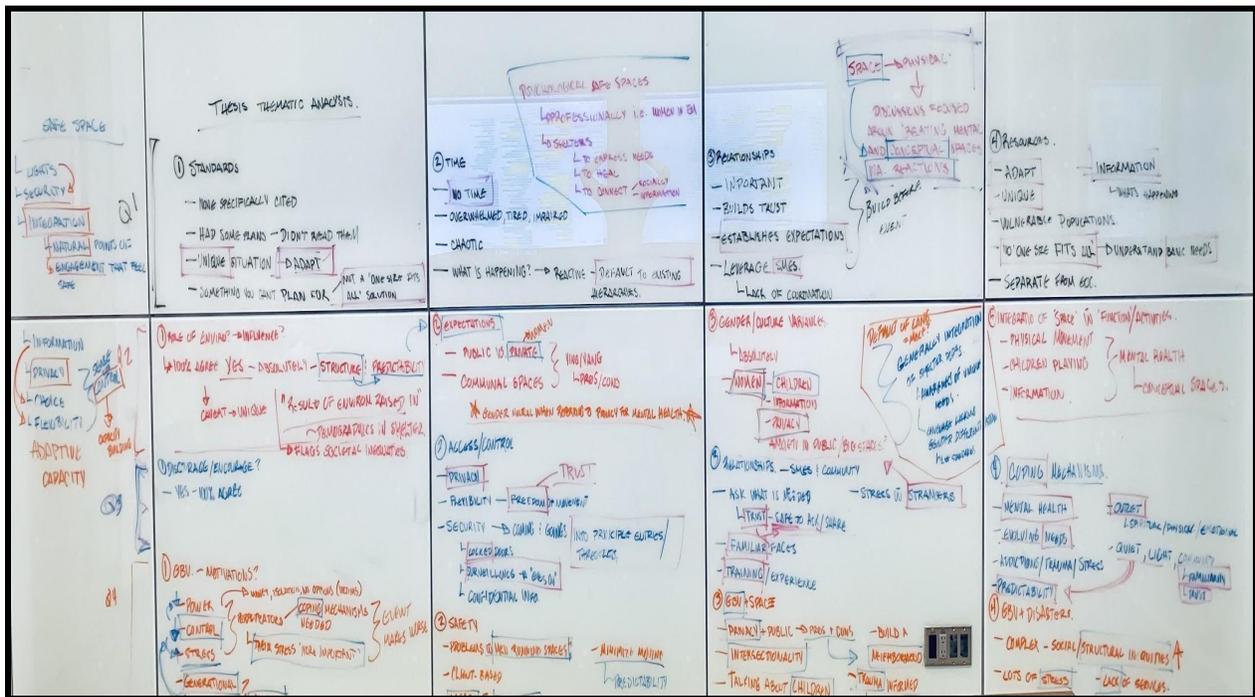
Sample of trending themes extracted in context of research questions

Motivation	Factor of Disaster	Increase of GBV?	Decrease of GBV?
<ul style="list-style-type: none"> - Power - Control - Stress - Coping - Generational - Complex - Desperate - Loss 	<ul style="list-style-type: none"> - Loss of control - Loss of resources - Increased stress - Loss of services - Opportunity to shift - Exposed systemic inequities 	<ul style="list-style-type: none"> - Isolation - Trauma - Stress - Lack of economic options 	<ul style="list-style-type: none"> - Coping mechanisms - Security - Special Matter Experts (SMEs) - Community - Choice
How do existing standards and practices consider gender?	Do practitioners consider space and behavior? If so, how?	What are some of the ways womens' use of space and needs differ?	How is this accommodated in practice and during events?
<ul style="list-style-type: none"> - Privacy - Children - Reproductive care <p>Comments regarding standards in response:</p>	<ul style="list-style-type: none"> - Function - Basic needs met - Mental Health - Quiet - Privacy - Choice - Unique 	<ul style="list-style-type: none"> - Privacy - Children - Anxious about next steps - Security - Smaller spaces - No corners 	<ul style="list-style-type: none"> - Adapting SMEs - Psychological First Aid training - Confidentiality - Relationships - Communication

- Overwhelmed
- Tired
- No time
- Hard to plan for
- Unique
- Shouldn't just be a plan
- Adapt
- Evolving needs
- Leverage SMEs
- Cultural variances
- Vulnerable populations
- Coping
- Flexibility
- Information
- Security
- Light
- Surveillance, "eyes on"
- Intersections
- Trust
- Trauma informed
- Expectations
- Basic needs
- Children

Figure 1

Thematic Analysis shifting into Narratives



The existing foundation in the literature provided a structure to identify and pull these narratives to the surface. However, inductive analysis was needed to help see the evolution of

narratives in the context of space and the use of place (Feraday & Muir-Cochrane, 2006; Guest, 2012; Yin, 2018). In addition, discussions and research that link the various bodies of knowledge, specifically from a North American perspective, are lacking (Enarson, 2006). Thus, while some excellent insights came from this analysis, some limitations warrant consideration before delving into the findings and recommendations.

Study Limitations

More research to determine more generalized findings is needed to apply the findings to various scenarios that involve different hazards, populations, and socioeconomic and cultural backgrounds (Yin & Campbell, 2018; Creswell & Poth, 2018). Also, case studies are laborious and time-consuming. Due to the constraints of the scope of this particular project, a more in-depth study with more cases to flesh out the nuances of the research problem is not feasible. Having more range of similar municipalities or a fuller spectrum to review in addition to the two cases examined: the Southern Alberta Floods (2013) in Calgary, AB and Hurricane Katrina (2005) in New Orleans, LA, would be beneficial in future work. This study's findings may help provide a foundation for more of that work to be done around spatial relationships and disaster and emergency management practices.

Recruiting participants who had experience as practitioners supporting the response and recovery efforts of Hurricane Katrina proved difficult. This difficulty is understandable given the time that has elapsed since the event and the vast number of agencies that may or may not still have the same personnel or contacts. There is also potentially the barrier that those contacted by me may not be familiar with Calgary, Alberta, and my affiliations with the university.

A fundamental limitation of this study is the direct attribution of causation to a specific component of space that results in gender-based violence and the ability to confirm this with an accurate number of incidences specifically. There are several reasons for this limitation. The first is that gender-based violence against women is consistently highly under-reported (United Nations, 2011; Cotter & Savage, 2019). The reasons for this are complex, including social stigmas, shame, and fear of not being believed to name just a few. Cotter and Savage (2019) also pointed to one of the main reasons possibly being that "various sources of data show that the perpetrator is most commonly known to the victims" (p.19) and that when this was the case, victims were less likely to report the incident as the fear of being blamed for the victimization was higher. This situation becomes even more complex in communities with people of color, who may also be hesitant to reach out to law enforcement.

Another limitation is the ethical considerations involved with asking victims about their experience of gender-based violence. Engaging victims can induce trauma and potentially create additional harm (Government of Canada, 2019; Halse & Honey, 2005). Therefore, the chosen methods did not involve interviewing victims directly in any way. These types of discussions require specific training and support to be beneficial to support the individual's healing process. This kind of expertise is training that I do not possess, and therefore not an avenue explored to garner data in this project. First-hand experiences may provide more specific insights into gaps in spatial awareness associated with gender-based violence not captured in the literature, or the interviews, primarily since reports of some incidents did not occur. This lack of data is a limitation. More research that can ethically support those who can provide this data and integrate

it into the context of spatial awareness would help refine the understanding of the relationship between gender-based violence and the physical environment.

The available literature mentions cross-over between the needs of cis-gendered heterosexual women, the spectrum of those identifying as women in the LGBTQS2+ community. However, there is a need for more research to understand better how to support all women of all backgrounds. The literature notes that the more layers of social intersections that a woman may possess (i.e., race and ethnicity, sexual orientation, income, age, disability), that vulnerability to all kinds of discrimination and a lack of resources tends to increase (UN Women, 2017; Lammiman, 2019). Participants did refer to the unique needs of these populations. However, data gathered for this project did not specifically focus on providing a detailed understanding of the unique needs and experiences of the LGBTQS2+ community in emergency shelters. More support for women of all backgrounds to do research that garners more diverse perspectives through the eyes of the researcher and interview participants is needed to truly understand the whole gambit of women's needs in our communities.

Chapter 5: Findings

This chapter will present the literature and the cases' desk study in conjunction with the interview data from participants involved in the two chosen events. There were strong consistencies between the key themes in the literature review and the data analyzed for this project. Therefore, this chapter will first highlight the current standard of practice by reviewing a sample floor plan, which is the only one available in the standards. Next, there is a breakdown of the interview recruitment results to provide context for the data discussed. The findings are then presented in the themes distilled in the analysis process, following the data triangulation.

Literature to Reality

Following the literature review, there was a singular floor plan available in the standards of practice. Looking at the standards and the information provided in the literature, I did a simple spatial study often used in architecture. This method helped see if the elements highlighted in the literature manifested in operational tools practitioners use as a template for emergency shelters erected in a pre-existing public facility (i.e., repurposing stadiums or community centers). The template studied was the singular sample floor plan provided in the standards reviewed. In the architectural design process, a standard tool for developing a floor plan is overlaying trace paper on your initial concepts or concepts that others pull together and highlight specific elements. This practice can help reduce the 'white noise' in a plan and help the designer focus on a specific aspect of the program they wish to address. In Figure 2, there are four simplistic sketches of the overlays of the template provided in the FEMA 2017 Field Guide:

Figure 2

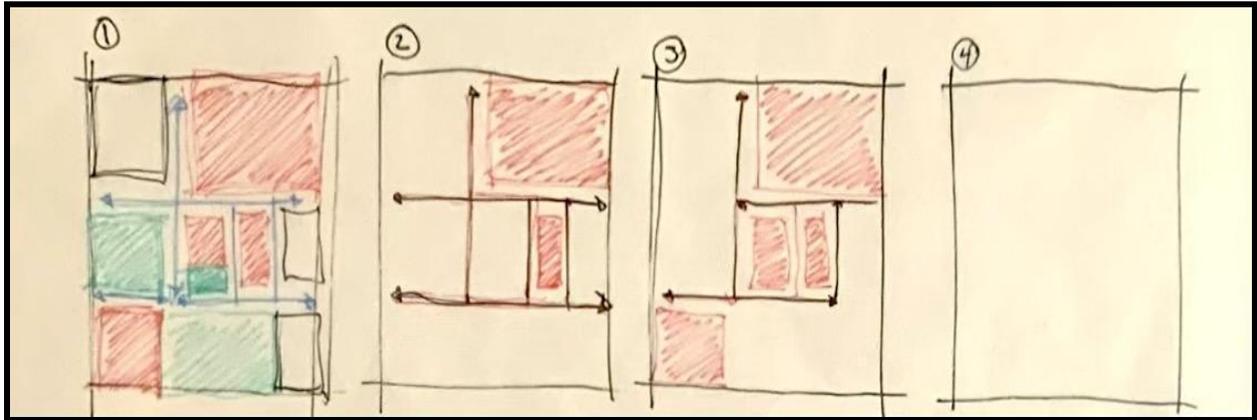
Spatial Analysis of a Mass Emergency Shelter Plan

Diagram 1 shows the public (green) and private (red) spaces, with the blank squares used for Operations and staff supporting the evacuees. Diagram 2 then looks at the spaces where women have been more vulnerable to gender-based violence, as noted in the literature (i.e., sleeping, hygiene, hallways to and from these spaces). Diagram 3 shows the spaces most heavily used by women, as identified by the literature (i.e., sleeping, childcare, bathrooms, healthcare support). Finally, in Diagram 4, I wanted to highlight the spaces noted in the plan specifically designated to be used by women. There were none. All spaces intended for childcare were to be accessible to families. While not denoted, this seems to suggest the typical nuclear family. Women are only explicitly mentioned when considering separating single women in the sleeping area. In the guide, there is a noted need for a breastfeeding space, given that at any given event, there are pregnant and nursing mothers who need this allocated, private space. The gaps noted in the spatial analysis proved to be incredibly insightful. These gaps reflected many of the omissions in the implementation of emergency shelters noted in the literature.

Interview Participants' Recruited

A total of 14 practitioners lent their expertise and insights to this project. A high-level overview of the demographics is outlined in Table 2 below to help contextualize the data provided by participants. Overall, 65% of the participants were women, populating almost every area of focus for the practitioners interviewed. Also, the minimum number of years of experience noted within this group of participants was eight years and ranged upwards to 31 years. When referring to participants' quotations in subsequent paragraphs, only an assigned number is noted in the text as identified in the table below to provide context for their input. To protect the confidentiality of the participants, in alignment with the letter of consent and research ethics approval, Table 2 does not include names, agencies, and identifying information of the participants.

Table 3.

Participants' Characteristics

Practitioners' Area of Focus	Number of Participants Interviewed in Area of Focus	Number assigned in text (i.e. Participant 1)	Participants that are Women	2013 Southern Alberta Floods	2005 Hurricane Katrina - New Orleans
Disaster & Emergency Management	4	1-4	2, 4	3	1
Social Services	3	5-7	7	2	-
Affordable Housing	1	8	8	1	-
Building Industry (Engineers,	1	9	-	-	1

Architects, Urban
Planners) *engaged
in response and
recovery

Women's Shelters	2	10-11	10, 11	3	-
Policy	1	12	12	1	-
Law Enforcement	2	13-14	13, 14	2	-

Themes

Throughout the interviews, participants flagged specific ideas consistently, regardless of individuals sectors and which event participants were referencing. The main difference in the participant discussions was the level of emphasis placed on particular themes and practices, depending on the field of practice of the individual. The themes noted below were extracted from coding data and noticing repetitive patterns in language and emphasis, which were then further refined through several iterations of review of the data (Yin, 2018; Auerbach & Silverstein, 2003). Several themes were highlighted and then organized into three groups to understand how the findings pointed to crucial aspects of the problem. The themes are grouped into three overarching categories to support further analysis and recommendations: practice, fostering safety, and status quo. Given the interconnected aspects of this study, some overlap occurs with some themes between categories; the overarching basis for categorization ties to the more prevalent thematic focus and application (Yin, 2018; Auerbach & Silverstein, 2003). The basis for this categorization is grounded in the applicability of the findings (i.e., for practitioners,

planning, social awareness, and considerations), with each category highlighting more nuanced aspects of the category.

Practice: Effective ‘Boots on the Ground’

Throughout the interviews, there was a certain level of focus on practitioners' need to plan, manage, and operate a mass emergency shelter. In addition, practitioners spoke to the challenges, lessons, and shifts in practice that resulted from their experience managing either of the case events. There were three vital components that all participants spoke to in some way, regardless of their professional background and area of focus: adapting, preparedness, and relationships.

Don't Just Plan, Adapt and Problem Solve. The scale of each of these events was unlike anything that these communities had previously experienced. There was a consistent narrative of a sense of being overwhelmed. Participant 5 noted that they managed “overwhelmed staff, and some were not managing personally very well” and that “[staff] had to construct the shelter in real time” as people arrived at the shelters. Many participants stated that they had to figure things out as they went. Participant 6 explained that they had to “learn on the fly,” suggesting that being able and willing to do so was invaluable. Participant 9 noted that when they picked up the phone after Hurricane Katrina had made landfall, they heard, “it’s horrendous, you need to come.” When the impacts happened, time was in short supply. There was no time to stop and read plans, review procedures and apply them to the varied factors of the reality of the situation and resources (including staff) who were available. Participant 2 stated that “there is always something you can’t plan for” and that “each event is unique.” Hence, there is a lot

decided and adjusted to suit the nature of the needs and situation. Many of the participants had experienced various other events, including the Fort McMurray Fires, Slave Lake Fires, Hurricane Mitch, Hurricane Sandy, and other smaller-scale events. The scale of the events examined and the mix of demographics impacted presented participants supporting the response with an experience unlike anything seen before. Participant 2 described it as driving home “the human side of disasters...”, which involves considering and managing “more than just life safety” for those in the shelters. Many participants echoed this sentiment, citing how vital it was to adapt as the needs shifted from physical safety from the hazard to supporting safety in the more holistic sense; physical, emotional, and psychological. Participant 3 summarized this sentiment well. He stated that it was essential to foster adaptability and flexibility when supporting different populations, citing examples such as culture, sexual orientation, economic status, gender, and even variations in nutritional needs as factors for providing care in emergency shelters.

The theme of adaptability expanded as participants provided additional clarity and began highlighting the need for creative problem-solving. Participant 6 noted the value of being able to “adjust as needed” to consider various perspectives before moving forward with a solution. Participant 4 provided an overview of problem-solving. She stated, “it’s important not to do a fatal flaw analysis right after, reverse engineer the problem [...] think about what it looks like from a life safety perspective, a fiduciary perspective, and affiliated with your network”. This participant was highlighting how flexibility around how an agency approaches problem-solving is important. Linearly rushing through problem-solving and seeking to move quickly to action

may not always be the best means to address a situation under stress creatively. There was an awareness that one must consider both the individual and the collective needs to adapt effectively. Participant 5 noted that “one or two people having a bad day means the group is having a bad day,” and that “you can have the best set up in the world, but people are people,” further highlighting the influence and complexity of these emergency mass shelters. Being able to adapt to a complex situation is a valuable skill. It is vital to appreciate how individuals may be experiencing the impacts (i.e., physically, emotionally, and psychologically). This understanding helps staff to address people’s unique needs in emergency shelters effectively. What is even better is that this skill is something that can be taught and practiced.

Preparing Practitioners. Due to the complex and wide range of intersectional vulnerabilities of the primary clientele that tend to use emergency shelters, having an essential skillset to fall back on when supporting these facilities' operations was deemed incredibly valuable. Participant 8 shared some constructive insight:

When crises happen, people want to come out in droves to help generally, and I mean, it’s good to have manpower, but it’s also good to have people who have had some training and who understand, who have volunteered, something that shows that they have compassion, and people who have training in human services. I think some people are well suited to it and others aren’t. I’ve seen lots of people who want to come out to help who are business-oriented, and it doesn’t work as well. They’ll go, “wow, that was crazy,” and I’ll go, “yeah, it was.” They’ll come at it from a business perspective, and

sometimes, well, hopefully, it opens up their eyes to the reality of a crisis. It is not all just numbers and statistics. This is what it is like.

Participants referred to the different types of human experiences that one might encounter in a shelter environment and the complexity of support that may be needed. There were several references to the need for training to support practitioners and volunteers who manage emergency mass shelters. Training included psychological first aid, previous experience volunteering in the community, understanding diversity and intersectionality, knowing whom to escalate issues to, and identifying issues. Participant 2 suggested that "we need to be aware of all needs. It's hard to plan and have one plan." She suggested that the solution was instead "training, relationships with special matter experts and awareness of who to escalate things to." There was a significant focus on training to support emotional and psychological wellbeing. Participant 11 explained, "psychological first aid is important for immediate needs"; Participant 7 reiterated this with the note of how valuable "program development for capacity building" is for staff's success in emergency management, later adding that "business continuity shouldn't just be a plan." With such training, staff could better assess and understand how to create a basic sense of psychological safety in emergency shelters and reduce the incidences of individuals acting out due to stress, potentially compounding existing issues. Supporting people's wellbeing on many levels builds trust between all involved, and the relationships generated help move the community one step closer to recovering from these disaster events and their impacts.

Relationships. The belief in the value of relationships was ubiquitous throughout the interviews. The primary focus of building relationships with other agencies was to leverage their

expertise to support particular populations. Participants deemed it essential to recognize that specific dimensions are prevalent in those who use these facilities following a disaster event when considering mass shelters. Participant 3 spoke to this by saying, "the longer an event, the more critical it is to have trusted relationships," highlighting the value of these relationships in managing mental health impacts. The value that exists in the relationships already built-in local communities is often under-utilized. Participant 7 stated that "rather than agencies [that] just parachute in, use those relationships." Marginalized populations in communities, such as those with a lower income, experiencing homelessness, or lacking resources (economic, shelter, vehicle, education), are understood to be those that rely heavily on emergency shelters. Participant 5 stated, "chances are any one of us ending up in the shelter are slim," referring to emergency management practitioners in Calgary. He went on to add, "disasters illuminate structural inequities, these shelters are not a cross-section of the community. Anyone with means utilizes those first. All citizens don't need support in the same way". An excellent tool to provide for these populations during the events was what Participant 11 described as a "client-based approach," meaning engaging and collaborating with existing agencies and special matter experts. Participant 7 explained the critical value of "having folks and relationships with the expertise if needed" to support staff and those impacted, as we "live in the speed of trust"; many participants echoed this sentiment. Participants 2, 5, 6, 7, and 11 all stated something similar: "leverage Special Matter Experts (SMEs)." Participant 7 expanded on this statement, recommending "engaging SMEs and industry leaders [referring to social services] to understand their clients and people." She then cautioned that this effort "needs to be very intentional," as it

affects whether trust is built or dismantled. Participant 3 cited Calgary's efforts following the flood to apply the lesson learned regarding the value of "emergency planning partnerships and relationships directly with the non-profit sector" and stated that "we know a lot of that will happen ad hoc but the fact that we have put structure behind that ahead of time has really benefited us I think." Those navigating significant losses of familiar environments and routines may find solace in the familiar faces of those who are managing their access to necessities, such as food, water, and shelter.

Many of the individuals residing in the emergency shelter may or may not have had positive experiences with government agencies in the past. For example, Participant 8 spoke explicitly to this point about individuals who may have immigrated as refugees or are members of a marginalized group: "trauma [might be] tied to congregate living [and] government-run facilities, which differ from the Canadian experience." Relationships and social networking are of particular importance to women. Participant 13 shared that while visiting the shelters, "the women tended to gather and talk...it was more of a social thing" where they were building networks and connecting with other women. They also mentioned that "men tended to come and go" once they had what they needed and seemed to prefer to socialize outside of the shelters. Participants' generally understood across the board that women tend to leverage and build their social networks and placed greater importance on their informal social ties and relationships.

Fostering Safety Holistically

Throughout the interviews, there were many ways in which to foster safety. At times, there were discussions around physical spaces and their attributes (i.e., clean, locked doors,

lights). The conversation with participants would invariably evolve. Most practitioners expanded the consideration of creating a sense of physical safety to basic needs and considering psychological impacts. The themes discussed below show how participants created a sense of safety physically, emotionally, and psychologically, or at the very least, the lessons and observations gathered through their experiences in the case events.

The Concept of Space. There was a unanimous agreement among participants that the physical environment affects human behavior. Many also identified that culture, gender, and life experience change individuals' need to navigate specific spaces safely. Features regarding using space in a physical sense for mass sheltering were generally focused on security, explicitly empowering surveillance and privacy for mental health purposes. For example, participants 5 and 6 both mentioned "eyes on - keep[ing] them [children] safe with more eyes" regarding safety in the congregate living situation. Other participants reiterated this practice to reduce the likelihood of violence against women, specifically domestic violence. When discussing fostering safety in spaces, there was an exciting focus on tools that support psychological safety more than the physical attributes or pieces that may construct the space. Once access controls were discussed, such as locked doors, security, and confidentiality information regarding those staying in the facilities, the discussion shifted more to the types of needs functionally met within the spaces. Participant 2 noted, "getting emergency managers to think about the citizen is hard. Once safe, they think the job is done. That is not the case, they have other needs, recovery needs," following this statement with examples that touched on emotional, psychological and spiritual needs. Practitioners built on the need to foster safety more holistically; for example, participants

2, 4, 5, 6, 11, and 14 all specifically highlighted: "quiet," "privacy," and "spaces to support coping mechanisms" such as spirituality, play, and physical activity. This shift from the physical controls into space (i.e., doors) shifted to constructing a perceived space. This perceived space manifested as sort of a theoretical space to, as Participant 1 noted, "build trust," "to ask questions," "to understand where they are in the process." These types of activities can happen in any location. However, it was noted that having familiar staff and some sense of continuity and structured uses in their environment helped to facilitate more of a theoretical space, one of psychological safety.

The conversations trended towards discussing tools to support healing and wellness as we moved past securing physical safety and promoting a sense of safety. Key features such as light, clear sightlines, access to the outdoors, play, spiritual and cultural practices, movement, and the ability to build community were highlighted. Participant 14 stated that "decent lighting outside deters people from gathering with ill intent" as an example of a way to increase one's sense of safety at home, as well as in public spaces. There was much overlap between safety features and those described as fostering healing. For example, participant 11 explained that natural light is a tool that "creates an atmosphere for healthy creative work and healing" if used thoughtfully. With light, there were distinctions between bright, industrial lights and softer lighting. Participant 14 commented that "industrial lighting works in extremes: on and off, which makes you feel anxious," referring specifically to large gyms and converted public buildings (i.e., community centers, public schools). Being able to feel more at home and less institutionally contained was also discussed. Words such as 'sterile' and 'cold' were often associated with stress, anxiety, and

discomfort. Creating a sense of home and fostering a sense of agency for evacuees to address their spatial needs in small ways was also mentioned to bolster psychological ease in a new space. Doing so was vital where there may be a public and private dissonance, given it was adapted to meet an unintended use. The scale was a big piece of this, and participant 8 explained that we must "take away the vastness" of spaces like gyms to foster a sense of safety. Another practitioner, participant 9, noted a similar sentiment regarding their experience responding to the Hurricane Katrina event: "I think if you want safety and to reduce the threat of violence against women in these emergency shelters, I think it is more practical to spread them out." Use smaller communities, FEMA trailers, hotels...". The attention to scale, light, and the ability to survey and understand one's environment readily in emergency shelter spaces was reiterated, specifically regarding fostering safety for women.

When talking about shelters in emergency management, there was attention to the different categories and types used for different phases in the response. While recognizing the planned types and categories, participants spoke more about operating emergency mass shelters as more of a continuum. In both events, relocation of evacuees happened, and in both events, those using emergency shelters needed to remain there for more extended periods than expected. Relocation and continually managing reassessing one's environment were considered to be something that should be avoided. Participant 11 stated that it was "too much to handle" for some individuals and explained that agencies would "lose people [in the emergency shelter] to going back to abusive partners, and rough sleeping." This experience helps to highlight the profound impact that a consistent space, or lack thereof, can have on individuals in difficult situations.

When given the option to occupy a public space Macgyvered into a private space, some women choose to go back to an unstable but familiar environment in place of adapting to new environments, as there are more knowns about how to get basic needs met when in a familiar setting.

Basic Needs. There were repeated insights around the demographics that these types of mass shelters would typically support in an event throughout the discussions. Participants 5 and 6 observed that disasters reveal cracks in the societal systems that govern our day-to-day lives; the existing inequalities are often disproportionately worsened. Those who need to come to the mass sheltering facilities following an event do not have other options. This detail suggests practitioners must adapt to meet unique and diverse needs prevalent in vulnerable populations that may not be readily apparent, such as mental health issues, existing and new traumas, PTSD, and addictions.

When discussing basic needs, there was a blended focus. Participants who worked more in the realms of social services tended towards expanding to include psychological safety into the discussion more readily. Other participants who worked in the front line response roles outside of the shelters focused on buildings being functional and physical safety maintained (i.e., removed from hazard, shelter, power, water, lights, structure). However, all participants mentioned and recognized the importance of physical and psychological safety and the role of societal stressors in impacting them.

All practitioners had an appreciation for the psychosocial elements at play in these environments. One difference noted was that female practitioners generally tended to note an

integrated emotional component of space, drawing more examples of familiarity, community, scale, and layering the different intersections of personal identity to feel less fear. These aspects were addressed in a more functional capacity when discussing space with male participants, who tended to describe tools and processes that supported increasing a sense of safety (i.e., trailers, vests, walkie-talkies, locked doors). Though both understood there were emotional and psychological pieces at play. Some participants provided more elaboration regarding needs that evolved following the initial evacuation and arrival to the shelter. Participant 9 noted that "there are stages of a disaster. The first weeks after a hurricane, it's all about saving lives" and explained that expanding considerations into spatial planning tended to play more of a role in the recovery stages. Participant 1 reiterated this:

when something big time is going down and the city is overwhelmed like it was in the 2013 floods, it's very easy, or not very easy but what I think ends up happening is that you go to the biggest, urgent need, you know, life safety, and what I'm getting at is that as long as someone was looking after the people and reception centers, from an overall administrative point of view, we didn't care about how the shelter was set up. It might have a part, this notion; instead of just being thrown over the fence to an ESS group, it might take more of a forefront in the overall event...What you are working on is too detailed at that point in the event. I'm not saying it isn't essential, but for how we were overwhelmed at that time, not that many people died, but that's kind of what we were worried about. We weren't so much worried about the overall interaction of people and their environment.

Both men and these participants' synopsis exemplify the prioritization of physical life safety and highlight the gap in practice that many of the participants spoke of needing resources and tools to address. Again, both of these participants were acutely aware and could appreciate the value of expanding how we consider safety in an acute situation. When it comes to providing emergency shelter, it is not enough to provide physical safety. This action may not always be enough to make individuals in these environments feel safe.

When exploring the concept of basic needs and spatial planning, there was a focus on the functions of the spaces to support mental health, cultural variations, families, and children. Physical attributes of space again leaned more towards controlling access points and maintaining surveillance to support safety. Then, the discussion shifted to manipulating spaces as known locales to access resources such as food, hygiene, sleep, and information. Participant 10 stated that "technology is a basic need" and noted how they scrambled to find chargers to support those in the shelter during the 2013 flood event. Modern cell phones can do so much now; participant 10 explained that phones were a gateway to access information, money, and vital social support. Many others supported that cell phones are a basic need. Participant 9 stated that when they arrived on-site, they had to track down a computer and printer to do their work for one event. As a result, he quickly became in charge by default of being one of the few equipped. That anecdote highlighted how, in a crisis event, having the right tools to navigate and manage a difficult situation can be a game-changer.

Understanding the severity of impacts of disaster events on an individual's psychological health led to conversations about the public's coping mechanisms, access to information, and

social support through a sense of community. Preparing to adapt and accommodate cultural needs, spiritual practices, and means of a diversity of identification was encouraged by most participants, who recognized that these aspects of identity and routine minimize stress. For example, participant 6 mentioned that it is vital for staff to ask questions and be open to requests that may seem different from a norm that staff expects. Asking questions and listening mitigate any sense of shame and helps build trust. Having healthy food and culturally appropriate needs met were routinely mentioned as an example and prepared to provide a space for prayer for those that may need it. These conversations also touched on sexual orientation, as well as enabling individuals to self-identify. Several participants mentioned that individuals in the LGBTQ2+ community tend to be more vulnerable to violence. Many noted that if gender diversity was not supported and recognized, this gap could increase tension and possibly even violence.

These aspects of a person's identity (i.e., their physical body, psychology, culture, sexual orientation, spiritual practices) were all considered within the realm of basic needs. Many practitioners stated that these might be "difficult to plan for" and that there is no "one size fits all" solution. Tools that practitioners noted could support meeting these needs were not so many physical spaces as they were means of communicating consistency of roles through visual queues. Participant 5 noted examples such as "vests," "signs," and "walkie-talkies," and participant 9 noted the importance of establishing "expectations for behavior," with others highlighting the value of a perceived direction in the response and of the use of programmed spaces. These tools implicitly created a sense of societal structure to ease accepting an adapted physical space and further support a sense of safety in emergency shelters.

Control & Defining Safety. It is essential to recognize that having a sense of control over some elements of their lives can establish a sense of safety. However, fostering some semblance of control for individuals may look different for different people. For example, with emergency shelters, participant 4 cited a tendency towards a "command and control" approach and practices that men have long governed; thus, actions may not necessarily support the public received there and not used to this particular culture. Participant 2 noted that "getting emergency managers to think about citizens is hard. Once they are safe, they think the job is done." She expanded further, stating there is much value that those who work in social services can bring to the table to address this issue. Expanding on who needs control and the value of its role for emergency managers and the populations' to both create a sense of safety was center stage when explicitly exploring how to support women's resilience in emergency shelters.

Control was a significant focus for participants in three distinct ways. First, they recognized the role that it plays in fostering a sense of physical safety. Many participants routinely mentioned the need for "doors that locked," (Participant 14; Participant 1; Participant 9; Participant 13; Participant 10) and "eyes on" (Participant 5; Participant 5; Participant 2; Participant 14) the space for those operating and staying in the emergency shelter to know who is occupying their space. Participant 4 specifically mentioned a "locker for belongings," which aligned with many comments about those in shelters. In particular, they mentioned women being distracted while keeping track of their belongings in a congregate living situation with people they may not know or trust. Second, there was an awareness of the value of controlled access to emergency shelters in general. Controlling the access to spaces was explicitly noted for those

known as violent offenders or who may present themselves at a shelter looking for a partner seeking refuge from domestic violence. Participants with experience in these dynamics identified controlled access as a great tool to support situational awareness of the complex supports needed by those occupying the shelter. There was also an appreciation for controlled access was also recognized as a means of increasing security for women who may be escaping violence. Participant 5 highlighted that those operating the emergency shelters during the 2013 flood event all understood the value of confidentiality for these reasons. He mentioned that staff used a messageboard system in the publicly accessible spaces (i.e., lobby) for people to communicate they were looking for someone instead of just offering access to that individual. Participant 2 mentioned the difficulty managing an individual's "right to shelter" if they are a known violent offender; participant 4 echoed this sentiment and noted that "there is still not a good solution for this." These dilemmas of managing fundamental rights to shelter and the need of those in emergency shelters to feel, at the very least, physically safe and secure in a tumultuous period of their lives.

The second piece of control discussed was less about physical access and more about behaviors that supported a theoretical sense of control. Quick visual references noted to support this semblance of structure included an organized, clean space and a clear set of expectations regarding behavior. Participant 5 explained how "two practical things helped...colored vests and walkie-talkies" helped individuals' expectations. These visuals signaled who the staff was for those who needed to talk about their needs and questions. Participant 9 noted that it is crucial to have a "functional building," pointing out that in Katrina, this was not always the case. For

example, some individuals used the stadium seating areas in place of non-functional bathrooms. Interestingly, they pointed out this influence on behavior: it "set the tone for people's behaviors" (Participant 9). Given the instability generated by an event, these small visual cues of cleanliness, color, and structure helped foster the semblance of control. In addition, participants used words like "flexibility," "choice," "voluntary," and "freedom" around access, use and, adjusting spaces to meet their needs as a means of fostering a sense of agency to reduce stress.

The last piece of focus was with regards to increasing rates of gender-based violence. When participants provided their thoughts and experiences with gender-based violence and its underlying motivations, they consistently discussed control and power, especially with those who worked in capacities that might support those who managed or escaped gender-based violence, such as women's shelters and law enforcement, and social services. Even participants who had no direct experience with it hypothesized it might be due to these similar motivations. Participant 9 speculated that it might be stemming from "boredom, desperation, lack of direction of future for some of these people," with others suggesting "a sense of losing control" or self-efficacy. Participant 13, who has more day to day experience in this realm, confirmed this sentiment: "these guys all want control [...] It does not matter if it is a family with six kids and indigenous, a family with two kids and immigrants, or a wealthy white family in a 2 million dollar home" and pointed to "feelings of jealousy and control - real or perceived." This concept was especially true if a loss was experienced, such as income, property, and other stressors. Discussions noted the cultural variances as having some influence in the prevalence of violence against women as

an outlet for lack of control. However, the overarching concepts of power and control were there regardless and more keenly felt when financial aspects were affected.

Fostering a sense of agency and capacity helps to build a feeling of safety regardless of gender; the value of this is explicitly highlighted in supporting women and children's safety in this dynamic, as they are usually on the receiving end of these coping mechanisms. Stress can increase the likelihood that individuals may take advantage of others' vulnerabilities as a means of seeking a sense of control. Understanding the relationship between increased stress levels and increased violence is important in ensuring that safety is maintained equitably for those utilizing emergency shelters.

Coping Mechanisms. Mental health was at the forefront of these discussions. All participants had a strong appreciation for the impacts that the stress of an event can carry with it, especially for those who tend to come to emergency shelters. Many of those who relied on emergency shelters in these events had existing complex stressors tied to addictions, loss, and trauma. There was an exploration of how to approach this, with suggestions ranging from removing individuals to establishing expected conduct. Participant 9 noted that it is important to "remove bad actors" who cannot abide by the expectations of behavior noted in the shelter. Others commented that, at times, this may not be an option, citing examples of those who are known violent offenders in the community still having the right to shelter. Alcohol and substances are an example of a coping mechanism that can exacerbate stressors and problematic behavior. Many participants expressed that disasters are complex situations to manage. Participant 14 noted that "alcohol is an accelerant," especially in the context of gender-based

violence. Participant 5 stated that setting expectations around behavior and fostering those relationships with those in the shelters in Calgary helped diffuse a situation where an individual returned to the shelter inebriated. There does not seem to be an easy solution to these situations. However, staff's awareness of these aspects of behavior and training can provide staff with ways to adopt coping strategies for those who need them.

One of the tools to cope with stressors constructively was the ability for those in emergency shelters to play or entertain themselves in some capacity. Participant 4 spoke about the value of the ability "to process what they are feeling in constructive ways" to help to ease tensions. Both play, and entertainment resources were vital in equipping shelters to support healthy mechanisms to cope with the disruption caused by such a major event. Participant 13 referenced an example of a shelter that they were aware of that created "a sense of community" using "common rooms, games, activities." The reduced tensions and connections that can come from play and entertainment are valuable. In addition, play and entertainment can support the wellbeing of those relying on the shelter to escape the hazard and the staff operating it.

The value of creating community while managing stress in these environments can help to reduce the severity of trauma that comes with the impacts of disaster events and alleviate the strain on staff. Participants were keenly aware of the importance of supporting staff's wellbeing to enable overall success throughout these events' response. There was a sense of what over 50% of participants described as "overwhelm," with participant 12 pointing out that mechanisms to monitor staff's stress and wellbeing need to be more integrated. More specifically, participant 12 noted that "people are very dedicated and do not stop when they are doing this work,"

referencing that she was aware of some staff and volunteers who took years to recover from serving citizens in 2013. She then concluded that staff's "ability to be creative and fresh is impacted" when they are stressed, tired, and not tending to their own needs (food, rest, recovery). Attention to the wellbeing and psychological strains involved in operating these facilities can reduce the likelihood of compromised adaptability and problem-solving skills, a valuable resource noted throughout the discussions.

Status Quo: Managing Assumptions and Noting Expectations

How society expects individuals to behave in their day-to-day lives does translate to the expectations placed on those impacted following an event. Throughout the interviews, certain dynamics regarding socio-cultural norms were discussed and highlighted by participants time and again. This focus was especially prevalent when discussing women in the context of emergency shelters. Many participants expanded the conversation to consider not just gender but ethnicity and economic status. There was an appreciation for the complexity of how people's experiences can vary in day-to-day life, and with them, their needs, actions, and behaviors. The themes discussed below were the three overarching patterns that repeatedly surfaced as participants shared their insights about supporting resilience and security for women in emergency shelters.

Women & Children. When discussing ways to support women, children invariably became part of the discussions. The focus often would shift quickly from women to support the children to ease the women's strain indirectly. There were often notes of women playing with children, entertaining them, feeding them, and helping them rest in describing the spaces.

Participant 5 described an emergency shelter set up in a building in Calgary with a climbing gym space that contained the children physically. The families and mothers with small children were moved here. Participant 5 noted that "it took the pressure off" and made it easy to know where the children were, who was around them, and potentially socialize with others in similar situations. Participant 5 then explained that when "talking about gender-based violence against women, you're talking about children"; it is an assumed default and reinforced in the participant's experiences with the emergency shelters. There were cultural and generational elements highlighted as factors that make supporting those that need help complex. Participant 11 stated that "this is a whole family, it's complex....as a society we want an instant solution, but it's not instant", simply removing the child may not resolve the family turbulence and gender-based violence. Participant 14 stated that there "has to be an opportunity for women and children to have their own spaces," with many other participants echoing this.

There was also a call for some degree of privacy, especially when discussing women who were previously in transitional or emergency shelters before a disaster event. The focus was primarily a means of release and play in these spaces as a coping mechanism for children. There was more a sense of containment for women, of a smaller space to manage their situational awareness. There were also suggestions to empower those in these spaces to have tools to discreetly communicate if women need additional support through signage or resources specifically tailored to those occupying these spaces. The focus was to create a haven that allowed women and children to relax and build their connections and communities in a safe space.

Congregating and networking among women is an exciting focus for the participants, even more so for those who work directly with those who experience gender-based violence. Participant 10 noted a fascinating observation in the 2013 Flood event. Both the transitional housing and emergency shelter for women were evacuated into a joint space. She explained that the women organized themselves not based on where they were in their living circumstances (i.e., transitional shelter or emergency shelter), which was what the shelter providers expected. Instead, the women gathered in groups based on who had children and who was single. The lesson, participant 10 explained, was "the need for flexibility, not leaping to boxes and assumptions." Participants provided other examples of how insights from programs and services before the flood event could extend into the disaster. For instance, a shelter in the community that offered options for those experiencing homelessness to sleep inside during winter and have a hot meal provided practitioners with some exciting observations regarding gendered needs. Participant 11 noted a tendency for women to choose to sleep in the women's only space offered instead of sleeping in the spaces that allowed both men and women. She suggested that "they felt safer with only women," and this happened regardless of their having a male partner who was present in that setting. Participant 14 stated that "women feel fear all the time; at best they may just feel vulnerable, and at worst, they feel fear," which was even more applicable if they have experienced past traumas.

Another piece of the discussion was around being open to women's unique needs. Participant 2 stated that it is crucial to listen to questions and requests with an open mind and not dismiss cultural, spiritual, child care, or health supports requested as unimportant. Participants

11, 13, and 14 independently pointed out that women have often developed ways to diffuse stress in their household and manage their responsibilities as the primary caretaker that may be unique to them and their family members. Enabling women to identify their unique needs and possibly the needs of other women in their network is invaluable. Women can then leverage their informal support systems to help them connect with those operating the emergency shelters and support the staff's awareness to adapt and prioritize resources in more nuanced and inclusive ways for those that need it most.

Privacy & Community. There was an interesting dichotomy between enabling a sense of community and also providing privacy in emergency shelters. Privacy and community were not specifically unique to women as a need, but for all individuals, regardless of gender. This balance was highlighted by 100% of the participants and often reiterated on multiple occasions throughout the interviews. The main reason for incorporating privacy and community in emergency shelters was to manage mental health impacts. Participant 6 pointed out that some individuals may get agitated due to having "nowhere to go to escape" or "to recharge." Public spaces were not explicitly described that way, but there was a focus on congregation and information gathering nodes. Participant 11 stated that it was essential to "create natural intersections in admin areas to intersect and meet and engage [with other residents]," as a form of "horizontal integration," as opposed to siloing people into specific areas based on function alone. Not doing so disregards the opportunities that exist when transitioning from one space to another. The integration and coordination of flow from space to space helped support a sense of surveillance and cohesive community when handled intentionally.

Despite the attention to integration for creating community, there was also an appreciation for unique needs and preferences. For example, where some may feel safer with many people around them, others may not. Participant 2 said that "everyone is different," it can depend greatly on how that person grew up and the experiences that shaped them. Again, as participant 3 noted, there is not a "one size fits all" solution. Many practitioners reiterated that there are so many factors to consider in disasters. Each event is unique; what worked in one situation may not be applicable in another. With privacy, there was a focus on access, specifically ingress and egress. When planning out spaces that women may need to access in emergency shelters, Participant 14 stated that it was imperative to place these spaces in proximity to exits to facilitate escape if women feel unsafe for any reason. Participant 14 noted that this would often be the first instinct of a woman who feels threatened. This practice is vital for spaces such as bathrooms, and participant 14 explained that a locked door would be critical for women to control access into space.

When thinking about accessibility of spaces for women, it is also important to recognize how women perceive a lack of safety or potential danger in their environment. Participant 14 explained that "threat cues are super complex, and we may not always be able to explain why someone makes us feel uncomfortable even if our body perceives the threat"; and stated that it is vital that emergency shelters "give women opportunities to get away from people that make them uncomfortable." Participant 5 noted a women-only room located on the 3rd floor of one emergency shelter. However, it was unclear what prompted this. A woman's ability to access these private women-only spaces readily would need to be considered either in a physical sense

(i.e., proximity) or with processes (i.e., buddy system) to ensure that accessing these spaces does not create situations where women may be isolated. Participant 14 explained that it is essential to avoid creating "a target-rich environment" where individuals can exploit vulnerabilities.

Participant 4 reinforced the implications for women and privacy and said that "when you provide privacy, you provide risk." For women, privacy has the capacity to both foster safety and make them vulnerable. Understanding how to manage spaces to leverage the former for women would be vitally important.

A tool frequently referenced to support practitioners with discouraging poor behavior in emergency shelter spaces was Crime Prevention Through Environmental Design (CPTED). CPTED is a practice used globally to support urban design that supposes that "the proper design and effective use of the built environment can lead to a reduction in the incidence and fear of crime, and an improvement in the quality of life" (Alberta Provincial Rural Crime Watch Association, 2021, *CPTED*, para. 1). This resource is a globally recognized tool that is grounded in research and best practices. For example, participant 9 noted that "it was against all of these principles: poor lighting, you can't see anything..." when discussing some of the emergency shelters they had seen in New Orleans. Also, participants 3, 7, and 9 all spoke to an increased awareness of the population demographics in the facility. Both CPTED and understanding the individuals being supported help increase situational awareness, anticipate and adapt to diverse needs to mitigate further internal tensions within the emergency shelter.

There was a very careful demarcation between privacy and required seclusion. Participant 11 spoke to old approaches in sheltering, stating that they were "all about locking the door and

shutting them away" and discussed the need for greater integration. When discussing private and public spaces, participants often used words such as "privacy" and "spaces to congregate," "create community," and "connect." There was a distinction with larger spaces, with participants citing examples such as gyms, stadiums, and arenas as problematic. Participant 8 said to "take away the vastness" to increase a sense of safety, with others reiterating this view. When asked about gender-specific safety, most participants noted the need for smaller facilities spread out in the community. Smaller space enables operators to facilitate a sense of being welcomed and a more manageable scale for personal and staff surveillance. These facilities tend to touch on other qualities noted to foster safety and a sense of community. Participant 13 provided some examples: "more homey", less "cold", "less institutional", "with couches and a TV", "carpets". Participant 14 reiterated similar sentiments, stating emergency shelters should not be "sterile," possibly with softer lighting.

The types of facilities used for emergency mass shelters (i.e., built with a specific intent to foster community connection) may also be more readily adaptable. Participant 2 said that it is important to consider keeping those who need emergency shelter close to their community if possible to minimize the sense of disorientation and loss. While that may not always be possible, using similar scale facilities that may seem familiar could help. Participant 14 mentioned that they were set up in a space to sleep in a lab while supporting a response for a different event; stating that another group stayed in a classroom instead and, while not ideal, at least it was "a known space" as "we have all spent a lot of time in classrooms, they are familiar to us," and so much more mentally comfortable. Familiarity was important for spaces used for both privacy and

community in emergency shelters, reducing stress and encouraging acceptance of a new environment and new people during a difficult time.

Intersectionality. Intersectionality consistently entered discussions, whether directly or indirectly. There was a robust understanding of the unique needs that can exist within a community of diverse individuals. Many agreed that gender is an essential piece, but not one that operated in isolation. During interviews, discussions about gender invariably led to many other dimensions. For example, participant 11 noted that it is crucial to think about "horizontal versus vertical silos" when thinking about space and sheltering diverse individuals who may be in need. Participant 5 discussed this as well:

Gender is another lens, and from an intersectoral approach, you know, women who may have experienced violence prior to coming to a shelter...the trauma that this would bring on is tremendous and it wasn't one of the considerations that we were looking at at the time.

Many participants expanded this notion of gender as one of many lenses to speak to examples of intersections of vulnerability, such as income, age, language, sexual orientation, and race. Equity was another example of a lens mentioned on more than one occasion, with participants appreciating flawed social systems' role in outputs such as access to resources, habits, and coping mechanisms.

While all participants noted attention to different needs based on social, economic, cultural, and health needs, it can be challenging to speak to other intersectional experiences without a frame of reference or someone to help bring it forward. There was an exciting moment

where participant 12 asked that I consider the demographics of those involved in this research as participants. She highlighted the potential assumptions that can happen when diverse perspectives are not at the table to highlight how we all may experience the intersections of race, ethnicity, culture, gender, systems, and institutions. Participants showed a depth of appreciation for the intersections that may be happening. Many suggested practitioners "ask questions," "be flexible," and "consider assumptions" when supporting populations following an event in an emergency shelter. There are many moments, especially in a crisis, where it can be challenging to understand, process, and adapt to different perspectives and approaches; this is vital in emergency shelters. The first step in integrating an intersectional lens to emergency shelters is increasing our awareness of the many lenses that influence the diverse individuals that make up our communities.

There was a big push to increase awareness regarding the diversity of experience and needs amongst participants. Operators of the shelters and the public residing in them need to be able to indicate needs and issues discreetly and constructively. This ability ensures that the right SMEs can be engaged to best support the individual. There was also the mention that women may not be ready to leave, or culturally, it is not acceptable when managing gender-based violence. Therefore, removal may not be an option. However, recognizing what women are navigating may create an opportunity for staff to discuss the specifics of the woman's unique situation to enable a more adaptive response and facilitate their ability to move forward with recovery.

Chapter 6: Discussion

Each of the above-noted themes ties into spatial relationships in some capacity, with more than just the physical dimension of spaces in emergency shelters, exploring the psychological spaces that individuals in these environments may create and navigate. The participants were well versed in situational awareness and conscientious of how individuals may have unique needs that can factor into their sense of safety. Many of the insights shared in the interviews reflected the insights shown in the literature. The practitioners were operating based on best practices from hard-won lessons. They showed great attention to the complexity of engaging with the public that may rely on emergency shelters following a disaster event. The central oversight was more so the practice of conceptually evaluating space from a strategic level to support resilience for women in emergency shelter environments. The discussion below will integrate and explore the findings in relation to the literature in three ways. The first section explores the tangible, physical aspects of the emergency shelters and types of spatial needs and relationships that may be at play when considering how to support women's resilience. Next is an exploration of the psychological space that people are navigating, influenced by the physical environment. This section is referred to as the 'perceived space,' as it is the cues and influence of emergency shelter experiences that create the perception of whether space is, for example, safe or not. Finally, there is understanding how the two dimensions, physical and psychological, are interacting in a way that fosters safety or creates additional vulnerability for women occupying the spaces within emergency shelters.

Physical Space

Critical aspects highlighted in the literature as warranting attention were top of mind for the participants regarding safety and basic needs. Lights, locked doors, privacy, and security for access control were all noted, though for the benefit of all, not just gender-specific. When focusing on gender-specific needs, elements such as locked doors, surveillance, and privacy that highlighted bathrooms and sleeping spaces as a vulnerable point became front of mind. There was a similar observation noted in the literature, where these types of spaces are particularly vulnerable to gender-based violence when in emergency shelters (Juran, 2012; Chaudhary et al., 2017; Saito, 2014; Hirani et al., 2019; Valerio, 2014; Martino et al., 2020). One noted vulnerability in the findings was the concept of egress to and from different spaces being possibly problematic. It was only discussed a handful of times, with one participant specifically suggesting the need to locate women-specific spaces closer to egress points if possible when allocating spaces in emergency shelters. Those with a background in law enforcement and participants who supported the response efforts in Katrina paid attention to potentially dangerous spaces in "dark alleys" and potential "corners to hide behind" when moving through space. This observation made sense given professional backgrounds, as well as the more tumultuous situation and the differing context in so far as far more severe pre-existing crime rates in New Orleans vis-a-vis Calgary (City of Calgary, 2013; United Way, 2014; Simmons & Casper, 2012; Fussell, 2017).

This perception also touches on similar points raised in the literature. The spaces between the assigned spaces, such as unattended corridors or stairwells, can be problematic as

these spaces are generally not considered in the programming (Saito, 2014; Nguyen & Van Nes, 2013). Outside of physical upgrades, such as widening the stairwells, improving lighting, or installing surveillance, little flexibility to physically adapt these spaces (i.e., corridors, stairwells) for a mass emergency shelter. Emergency shelters can only be used as a last resort to support citizens needing immediate shelter from the hazard (Farmer et al., 2018; Quarantelli, 1982). There is limited time and resources available to adapt a space physically in any significant way, without advanced planning and multi-purpose needs integrated into the design of the buildings typically used for this purpose.

At the onset, there was a lack of time, planning, and resources for both events; this makes the automatic allocation of uses to the adapted emergency mass shelter spaces vitally important. In the interviews, the primary focus of these converted emergency shelter thoroughfare spaces was as opportunities for sharing information (i.e., signage) or as points for building a connection. Three participants pointed to nodes of thoroughfare possibly being useful, where they may intersect with public areas (i.e., lobbies) or for gathering information on notice boards. Integrating these functions aligns with the literature, noting that women prefer the direct access points in urban environments. This fact is especially with significant pedestrian traffic and integration of the theoretical street and essentially eyes on the street to feel more secure moving through public spaces (Gerell, 2018; Nguyen & Van Nes, 2013).

In both events, there was little planning for emergency mass shelters. In New Orleans, the agencies resorted to selecting the Superdome as a shelter of last resort (Simmons & Casper, 2012). Those participants who managed emergency shelters spoke to a sense of chaos and

overwhelm at the onset of these events. There was a lack of capacity to assess and strategically maximize the use of spaces from a gender-mainstreamed perspective in the moment.

Gender-mainstreaming needs to be part of the baseline planning requirements to appear in any implementation in the field to avoid overlooking the gender-specific needs of women (Hirani et al., 2019; UN Women, 2017; Marsh et al., 2006; Martino et al., 2020; Valerio, 2014; Hilhorst, 2018; Juran, 2012; Saito, 2014; Enarson, 1999; Rumbach et al., 2016).

When discussing certain aspects of emergency shelters concerning gender, the spatial organization changed; for example, privacy equated to fostering or managing security instead of looking at it with a gendered, women-centered lens. The literature stressed the privacy needed to support reproductive health and care needs. These needs are typically unique in the breadth of applicability to women (i.e., hygiene, breastfeeding, child care) and the vulnerabilities and societal implications involved in their physical exposure (Martino et al., 2020; UN Women, 2017; Reid, 2010). The focus was on the individual scale, honing in on the primary caretaker, stereotypically the woman. Given this, the structure reinforces the societal focus on a woman's body as an object with the gender constructs of the private domain (i.e., caregiver, reproduction) tied to its presence. However, through conversations with participants, privacy for women was more about women's ability to control and readily maintain situational awareness of these private spaces and those that occupy them. Participants consistently noted that privacy, while essential, is also problematic. Participant 4 specifically noted that "when you provide privacy, you provide risk," with others echoing similar sentiments, as safety is not a guarantee in private situations. Several participants stated that "there are pros and cons" to private and public divides.

The literature substantiated this concern for women: "privacy operates as a mask for inequality, protecting male violence against women" (Spain, 2016, p. 148). Many participants suggested that a successful solution is one whose objective is to create trust and opportunities for women to reach out for support discreetly, fostering their ability to rebuild informal social support systems. Physically, pieces such as signage in strategic locations and thoughtful spatial programming to socialize. There are possible downsides and dangers of privacy for women supported in the literature. In many cases involving gender-based violence, it is more likely to happen in private spaces. Women often know the perpetrator (Pain, 2001; Statistics Canada, 2014; Canadian Foundation for Women, n.d.). Thus, women having physical control of access to their private spaces via the locking of doors and the ability to maintain a sort of container for themselves, and their children, were noted in the findings to be helpful to support a sense of safety for women in the physical spaces.

Another interesting physical element supporting women's ability to manage their space in this research was the scale of a space. In the discussions with participants, there is an association of smaller-scale spaces with an increased sense of safety. Participants cited many reasons for this: temperature, reduced numbers of strangers, noise, lack of privacy, and a general sense of overwhelm. Participant 8 said it was essential to "take away the vastness," with many others in emergency management, law enforcement, engineering, social services, and women's shelters reiterating this. Nguyen and Van Nes (2013) had pointed to a problem with "mono-functional" divisions of spaces, such as rinks, stadiums, and gyms. The perceived sense of safety increased for women through greater connection and diversity of the use of space in the public sphere

(Gerell, 2018; Nguyen & Van Nes, 2013). In addition, smaller, modular spaces at the scale of the individual body were easier to maintain awareness of the critical factors influencing safety, such as those that occupy the space, entries, and exits, lighting, as well as areas to avoid (Nguyen & Van Nes, 2013; Gerell, 2018; Gins & Arakawa, 2002; Townsley, 2009). This finding reinforced participants' preference for smaller spaces (i.e., gyms, rinks) and more integration with varied spaces. One participant with significant experience in post-disaster sheltering practices expanded on the discussion of scale: she stated that shelter practices should apply flexibility and modularity to enhance safety when considering spatial programming.

Perceived Space

Our relationship to our physical environment is powerful and one that the literature and the findings noted to be influential. Participant 9 spoke to being properly equipped, referencing a government agency that:

prides themselves on having warehouses full of gear and stuff, like they bring in semi-trailers before a hurricane just to have that fast response, right. So I don't think that they had the right tools in place for that kind of scenario.

This comment was concerning supporting the response efforts for the people in New Orleans. Participant 9's experience highlights the following dynamic of the findings as well. There is another type of space built and influenced for individuals in an emergency shelter, a psychological space built based on individuals' unique perception and experience. Participants had a significant appreciation for mental health's role in how people may interact with the provided shelter space. Asgary and Azimi (2019) determined that emergency mass sheltering can

be detrimental to the mental health of inhabitants, emphasizing the role that space and place have in fostering a sense of psychological safety. Within the literature, this manifested in discussions around the societal norms, with the public and private functions of space aligning with the gender-specific roles assigned to women leaning more to that of reproductive care, familial obligations, and priorities (Enarson et al., 2007; Juran, 2012; Spain, 2006; UN Women, 2017). In the findings, there was an appreciation for the role of building out this sense of stability by channeling elements that create a sense of familiarity and home. The end goal of fostering this sense of familiarity is to reduce stress and stabilize the situation. Many of the participants' recommended reducing stress and creating a sense of control for those using the emergency shelter. Participants suggested solutions aligned with Felten-Biermann's (2006) findings, tying the breakdown in societal structures and a sense of lost stability to greater incidences of sexualized violence. In both cases, the physical surrounding changed significantly. Resources, communities, and daily routines were all disrupted. Then thousands arrived in shelters to try to have their basic needs met. This disorientation was a significant focus of participants, who appreciated its role in people's behavior.

Drawing on the concept of the built discourse, where words can manifest an environment, the diction used and not used by participants and the literature demonstrated the gender divide in public and private spaces (Gins & Arakawa, 2002). Planning of these emergency mass shelters was not at the scale needed in both events. Where it is not feasible to physically alter a space significantly for an emergency shelter, and the rapid response required, the concept of the perceived space as a sort of psychological container emerged. Coping mechanisms were always

focused on stabilizing the internal space of individuals. The event first destabilizes the physical space. Then tensions are exacerbated as individuals enter an environment where the private functions must exist in a public space (Felten-Biermann, 2006; Spain, 2001). Managing and adapting to these tensions can be more readily done if individuals have less internal stress and are allowed more familiar forms of agency (Martino et al., 2020). The focus on communication and signage, on fostering discourse within this space was an essential tool noted as well, further building on this concept of creating a sense of social stability or new social 'container' within an adapted space, specifically through the use of language (Gin & Arakawa, 2002). One participant noted that in COVID-19 care facilities that existed in adapted spaces, mentioning curtains used to "create the illusion of privacy;" she suggested there is a lot of value and mild relief of having even a tiny amount of control of one's space.

In the findings, conversations evolved to the emotional aspects of emergency shelter spaces that needed to be supported. The dynamics of control and power were undoubtedly appreciated by practitioners, reinforcing the literature findings that pointed to overarching patriarchal influences. These conversations were more nuanced when looking at the Calgary 2013 case, given that the scale of physical instability and disruption were much less severe than the context applicable to New Orleans (Gerrell, 2018). However, appreciation for setting expectations and creating a welcoming atmosphere was reiterated again and again by participants. Rebuilding that social container creates a sense of structure, of stability, of place. The literature spoke to a gap in understanding the integration of the physical and metaphysical realms; however, practical understanding exists and was front and center in many discussions

(Mitchell et al., 2012; Akerkar & Fordham, 2017; Lidewij, 2013). The potential points of weakness included having the right tools to integrate these realms more effectively.

Understanding Place & Gender Based Violence

Going back to the pieces that are at play when choosing a location for an emergency shelter, Asgary and Azimi (2019) pointed to:

disaster characteristics (i.e. familiarity, duration, severity, the scope of impact, destructive potential and the length of the warning period.), demographic characteristics (such as age, gender, physical disabilities, race and ethnicity), shelter characteristics (such as campsites and community centers), perceived awareness of hazards and preparedness level, social bonds in emergency shelters and socio-economic status (such as education and income) (p. 132).

While these are all critical features to consider, there is little direction in operationalizing all of these intersections of human dimensions and environmental influence. Participant 11 noted that the physical environment is "an ecosystem"; there is a very functional approach to choosing a location from the discussions. The integration of public and private should seek spaces where we can accommodate siloed areas based on function.

With command and control dynamics to operations, the nuanced and inclusive language of Sphere (2018) for gender-mainstreaming falls away the further down the jurisdictional and operational chain you move. Participant 4 noted that this tendency to rely on command and control and the agencies within this structure might not be practical. She described it as managing "force with force"; relationships with governing and enforcement agencies may not

always be the best option. Defaulting to command and control may not be the best option to de-escalate a stressful environment. Participant 4 also explained that it is crucial to be mindful of whether the public feels that these command and control individuals (i.e. military, security and first responders) can be trusted. The literature illuminated a similar sentiment and dilemma, referencing the problematic abuse of power between male security and women who used the emergency shelters (Valerio, 2014; Enarson et al., 2007). The tendency of emergency management to lean on the linear, top-down command and control approaches resembles the implementation of the functional building blocks of an emergency shelter. Our spatial relationships move from a complex ecosystem with places tied to socio-cultural norms, expectations, and comfort to the command and control system's tactical lists with boxes to check. Participant 4 noted that the public generally does not operate well in the command and control dynamics, as it is often not a realm they inhabit. There is a call to strengthen the horizontal relationships as much as top-down relationships to ensure an effective response (Kettl, 2006).

When thinking of safety in emergency shelters, isolating only physical safety without creating significant risks to women is impossible. Hillhorst et al. (2018) spoke to the need to consider the "relational" qualities of gender dynamics (p. 55). Looking at how spatial programming can impact women's safety in these environments, the tendency to approach the operation and prioritization of physical necessities, followed by building in psychological supports and moving linearly, is detrimental. Unfortunately, the physical and psychological handling is not usually an integrated approach in initial response in both the literature and the findings, at least not for emergency shelters.

Quarentelli (1982) noted that sheltering occurs in a much more complex way. The physical space allocated during an event can play host to anything from emergency shelters to temporary shelters. The intention of emergency shelters and shelters of last resort is generally only to provide the bare minimum for survival (RRU, 2010; Asgary & Azimi, 2019; Nigg et al., 2016). Participants did not speak in specifically phased and siloed language when discussing emergency shelters. Instead, participants had heightened attention to mental health and stress management support. One mentioned that more strategic considerations of spatial programming were not in response and usually appeared later in the recovery stages. A participant had pointed out that it can be challenging to have those in a response role take what women highlight as relevant with the same level of concern as their male counterparts (i.e., physical safety versus mental health). Simmons and Casper (2012) discussed various aspects of power in their work, pointing to "the ability to control the discursive rules of the game" (p. 677); this was vital when thinking of those who have power versus those that do not. The social dynamics are slowly changing.

In an emergency response environment, where the decision-making and operational approaches are typically male-dominated, the lack of diversity reveals what we prioritize and consider important in the heat of the moment. Interestingly, participant 4 noted that women tend to be prevalent in recovery roles. Men tend to occupy response roles within the disaster and emergency management profession. The more siloed dispersion of gender could potentially create problems for women in shelters, where addressing escalated stress, a lack of control and

safety can potentially result in forfeiting their physical safety in the interim (Pain, 2001; Spain, 2017; Valerio, 2014; Pardee, 2014).

Managing the escalation of existing tensions following a triggering disaster event and then possibly sustained through the following stages in shelter environments can mitigate the release of stress and frustration in more violent ways. Furthermore, the literature noted a tendency for men to use women as a tool for emotional release, specifically for coping with public stressors (i.e., income, job loss, property loss, public role, and identity) that foster a sense of emasculation (Spain, 2016; Valerio, 2014; Juran, 2012). Current patriarchal constructs still project a sense of women's bodies "as objects, especially sexual objects" (Sweet & Ortiz-Escalante, 2015, p. 189). It is vital to understand that "violence against women faces an "intersection of invisibilities"" (Martino et al., 2020). The research maintains that women's bodies are not just objects but a manifestation of a private 'space' controlled with all familiar spaces and places men felt they were in control of disappearing following a disaster event. Interestingly, participants focused mainly on women having agency, control, and power over their own spaces, whether expressed by determining who could access their space or voluntary comings and going from shelter locations. Pain (2001) referred to women having to control their own spaces as "spatial practices," which can "be practices of resistance" (p. 904). Participants included examples from their experiences, such as individuals in shelters being able to ask for needs to be met and know they will be listened to and adapt spaces as needed. There were also comments from participants and the literature regarding considering the need for female-only staff, ensuring

that power dynamics remained horizontal within spaces used to heal and feel safe (Kettl, 2006; Enarson et al., 2007).

The need for shelters to build in micro-spatial supports for stress management for all individuals and developing social capital so that those occupying the shelters can leverage each other's capacities to navigate their next steps. Within the shelter, developing a sense of safety through familiarity, touches of home, movement, privacy, and understanding one's sense of place in the new norm (i.e., economically, socially, community) are vital. This shifts emergency shelter from just being a safe space to a safe place. Place matters. It is a guidepost and constant physical reminder for our social and human identity, and, as one participant noted, "people rise to the level that you meet them." Thus, our first touchpoint for the needs of those displaced is to be at a level where we support individuals to rise and build back better and more supportive communities.

Chapter 7: Recommendations & Conclusion

Many different solutions were discussed to address the research problem in conversations with participants and the literature. Below are different categories and realms that disaster and emergency management practitioners can explore and build out in their sheltering practices. Spatial programming can be approached from a myriad of ways, not just physical alterations of spaces but also by our engagement within them. This chapter will discuss the different recommendations that have come about as a result of this research project. There are four categories of recommendations, organized based on how they would be applied. The first category is training. The practitioners identified that more training is vital in the planning and preparedness phases of emergency management. The next category focuses primarily on emergency management as a practice and the recommendations for changes to the current practices to address women's resilience in emergency shelters. Then, the recommendations shift to the policy and legislation that impact the urban built environment and how it can better incorporate gender mainstreaming. This approach can support greater awareness and integration of gender mainstreaming in emergency shelters in a time of crisis. Finally, the last category looks at the need for more research to better understand the problem of gender-based violence in emergency shelters. Greater awareness of the problem can increase resilience and equitable security for everyone who may need to rely on emergency shelters following a disaster event.

Training

One of the pieces highlighted by participants, particularly in Calgary, is the value of practical training for properly equipping those that support sheltering efforts in the response.

There were lessons learned discussed in the interviews and subsequently applied following the case events. Efforts to better prepare staff and volunteers with tools like psychological first aid have yielded positive results and more effective support in response efforts since the event.

People's ability to continue readily learning and adapting is becoming more and more vital as we understand the complex impacts of disaster events more and more. This section will flesh out specific training that may enable practitioners to have more knowledge and trained skillsets at their disposal. The suggested training intends to enable practitioners to adapt more readily to the diverse needs of those they support in any given event.

Integrating Spatial Awareness to Foster Conceptual Safety

Practitioners demonstrated a strong appreciation for our physical environment's role in influencing and impacting human behavior. While the Sphere (2018) standards speak to integrating private and public spaces, this approach does not seem to manifest in the practical application of that standard. What does it look like, physically, to integrate public and private space effectively? When reading the Sphere standard, this was not made clear. Practitioners noted a standard guideline regarding principles for fostering safety and influencing behavior from a spatial perspective: Crime Prevention Through Environmental Design (CPTED) principles. This guideline is an example of a readily available tool that can support planning these settings. CPTED principles can improve awareness of the architectural elements of the spaces coupled with how these elements might be priming poor behaviors and various ways to address these primers. The solutions range from structural alterations to more accessible options that leverage color theory and minor adjustments to egress and ingress. In addition,

collaborations with local architectural and urban planning practitioners to foster more awareness of spatial programming and how to adapt it could support those in the field as they adapt to the event and individuals' shifting needs.

Trauma Informed Action

Mental and emotional health were both at the forefront of this research. Participants highlighted supporting these needs, especially given the disruptions that follow a disaster and existing traumas and complexities that individuals navigate. Psychological first aid and training that supports staff's awareness of how and to whom to escalate incidents of gender-based violence will help foster trust and ensure that those victimized can receive the support they may need. Training, such as Psychological First Aid, helps staff identify the needs of those in the shelter, pivot more effectively to support individuals, and recognize when to source other forms of intervention.

Exercises

Exercises that specifically enable practitioners to develop and hone spatial awareness practices (i.e., CPTED) would be helpful to support more readily identifying problems in emergency shelter plans. It is one thing to learn a skill and another to apply it, especially in a high-stress situation. Most will default to more familiar and comfortable practices, so using exercises to help ingrain spatial awareness can improve how practitioners make spaces safer for women. Both events demonstrated a lack of time and significant pressure to choose an adequate emergency shelter location. Participants noted that these large-scale events are challenging to plan for and that there is no one-size-fits-all solution in emergency shelters. Having the time and

resources to set up an emergency shelter in different spaces and look at emergency shelters from a gendered lens requires awareness and time. Leveraging CPTED and other spatial tools can help support more effective and rapid decision-making in the response phase and as the event evolves. Time was an invaluable resource. More hands-on experience can help accelerate recognizing spatial programming decisions that may create unnecessary risks for women, especially amid a chaotic and fast-moving response effort.

Leveraging Internal Capacity

Training that equips staff operating shelters to leverage the internal capacity of individuals residing in the facilities would benefit the efficiency of sheltering and the recovery process for many of those impacted by the event. Transforming those in emergency shelters from just individuals who need saving to those that can also act as champions of their communities needs to be integrated into the response process. This action would help build a sense of community in the emergency shelter itself and alleviate the strain that staff responding to the event may feel as they manage long shifts and demands. Training staff to recognize which individuals can help others around them and who may need additional support would be essential to mitigate disproportionate access to resources. At check-in, including a section for individuals to cite strengths and skills that might be helpful in the emergency shelter is a simple way to recognize the capacity of those around them to contribute to the recovery of their community and sense of place.

Creativity & Play

Participants identified the need for individuals in these spaces to process the events and their experiences throughout the interviews. Training that equips volunteers and staff working in emergency shelters with games and creative tools that help relieve stress and build community cohesion ensures these practices can be readily employed when needed. Some examples of planning for these activities suggested were ensuring there are quiet spaces, spiritual spaces to practice, or simple supplies (i.e., pens, pads of paper, books, music, movies, sports equipment) to express or play therapeutically. Recognizing the place these activities play in creating psychological and emotional safety for individuals while possibly rebuilding a sense of community is invaluable. Having staff on site that can lead these activities or support the facilitation of creativity and play while possibly encouraging those in the shelter to facilitate will help the task less onerous to implement. These skills are also accessible, low cost, and adaptable for varying demographics. For example, different cultures may have different game variations. These variances present an opportunity to share and learn more about one another, and are a quick win that empowers residents, builds cohesion, and fosters a sense of play. Understanding of which modalities may be best would naturally vary depending on the individual. Leveraging the expertise of local practitioners in mental health coupled with community leaders in the planning and preparedness efforts may help to adapt these approaches more effectively. More research regarding the best approaches to do so in the specific context of emergency sheltering would be needed.

Increasing Awareness

The first step to addressing any problem is increased awareness. Taking steps to discuss gender-based violence in a myriad of environments more openly can foster a better understanding for staff operating emergency shelters. Understanding the nature of the problem, how it comes to be, the impacts, and how to help stop it enables staff in recognizing how they can best help address what women may need to navigate their particular situation. In addition, normalizing this discussion can help take it out of the shadows. Doing so will reduce the societally programmed shame that can prevent those affected by seeking the support and resources they need. Also, increased awareness helps staff and community volunteers understand the role they can play in supporting women through difficult situations.

Emergency Management

There are many opportunities to learn, grow, and evolve the practice highlighted in the findings within disaster and emergency management. Practitioners have implemented some recommendations suggested by both the literature and the participants following the case events. Thus, there were anecdotal improvements referred to in the interviews that have since come about. Below are some specific recommendations noted in the findings to be certain changes in practice that would have the most significant possible impact on incorporating gender-mainstreaming into emergency shelter practices. These recommendations leverage existing practices that are relatively commonplace in disaster and emergency management and shift the implementation and objective of the practice to incorporate a gender lens.

Reconceptualizing Planning

There is great value in planning and preparing communities for the local hazard that might impact their day-to-day lives. However, recognizing the dimensions and ways people might use and operationalize resources and plans can make them more useful for practitioners. Each event has its unique challenges, and this research highlighted the importance of integrating human dimensions into operations. When planning for these large-scale evacuations, understanding the needs of these populations and the types of facilities available to communities is helpful. Exercises are also valuable for identifying the gaps in training or practice when setting up and operating an emergency shelter to support the diverse needs of those who typically access these shelters. Gaps may generate recommendations such as using different types of equipment, training staff to approach the scenarios differently, and shifting how staff may provide or seek access to resources. There is even the possibility of building more relationships with critical stakeholders ahead of time and leveraging them more rapidly in the initial response phase. Instead of a specific plan that may not cater to the event's needs or create rigidity in operations, planning should focus on developing the adaptive capacity and support systems that feed into these operations. That way, practitioners can feel more comfortable in their decision-making and have mechanisms to adapt and ask for more resources if needed.

Redefining Basic Needs

The priority in response is often saving lives. However, the research findings noted that physical and psychological safety does not operate in isolation. Initial response efforts need to recognize the importance of preserving the safety of both, expediting and supporting the more

effective recovery of communities, and mitigating the negative impacts of being projected onto more vulnerable populations. The basic needs of displaced populations need to include supporting and meeting their physical and psychological well-being. This shift needs to become more prevalent in Disaster and Emergency Management practices and reflected in our standards and guides. Currently, psychological support happens in siloed spaces in the shelter guides (i.e., healthcare and mental health have their own space). Instead, it would be better integrating opportunities to improve mental health into how individuals occupy these spaces. There are opportunities to expand the application of these considerations more holistically. To do so would first require a review and adaptation of how we define basic needs. This shift has begun at the international policy and standards level, but more work to integrate these approaches in the localized practices must be done. Equalizing the corresponding value of psychological safety with physical safety can also help support the importance of other needs (emotional support, mental health, spiritual, cultural) that an emergency operations center should consider.

Stakeholder Engagement: Who is not at the table?

There were several points in the literature and interviews where awareness of the intersection of invisibilities played a significant role in approaching response. Having more diversity in perspective and experience at the table is important, ensuring that practices and efforts are inclusive. This inclusivity helps to not leave the most vulnerable behind by representing all demographics of the community with a voice at the table. Those who can speak to the diverse needs of communities are invaluable assets for mitigating complications in response efforts and expediting recovery. Recognizing intersectional disparity in our practices

and taking steps to address it will support a more inclusive, supportive, and practical approach to all phases of managing a disaster.

Relationships

Building and leveraging relationships with subject matter experts, community leaders, infrastructure operators, and different levels of government were proven to be vital in creating a more supportive emergency shelter. There are various complexities in these environments, and disaster and emergency management practitioners may not have the specialized expertise to effectively address all of the dilemmas. Having these relationships in place before any event and understanding each agency's capacity and limitations may empower more effective resource allocation and decision-making when a disaster strikes. In addition, relationship building within the shelters is vital. Staff and those they are supporting are not separate entities but rather a community. Building trust and seeking to understand and connect with those in the shelters would significantly improve the facility's dynamics and facilitate critical awareness around unique needs that existed and evolved in the shelters.

Communication Plans

There is much work to be done around communicating to the public, especially involving the role of emergency shelters. Communication plans and strategies that empower bystanders and those women within shelters to alert operators to their need for support discreetly is vital. This kind of communication practice can increase awareness of issues that may previously have gone unknown to the staff. Community awareness was deemed especially important for mitigating gender-based violence and creating a path for women to access supports that suit their specific

needs. Information sharing about the event's status and where individuals using the shelters find themselves in the response and recovery processes were also crucial to reduce stress and foster a sense of control. Understanding and planning for these different communication needs, thinking about spaces that might be options for sharing different types of information, and using technology to do so are fundamental. Considerations for language barriers and cultural variations within the community around societal needs and norms will be needed to ensure the communications are accessible to as many people as possible.

Policies & Legislation

These recommendations speak to how human behavior, valued and not, tends to manifest in our legislation, policies, and standards. Recommendations for policy and legislation are needed better to support a more holistic approach to the research problem. The literature and findings highlighted instances where our legal system, standards, bylaws, and codes still have aspects that apply patriarchal values and disadvantage women when a disaster occurs. Our laws and policies are a reflection of our societal values. These recommendations propose options that would incorporate gender-mainstreaming to support women's resilience in emergency shelters and disaster recovery.

Building Codes, Land Uses & Design Practices

Some types of facilities are consistently leveraged during responses as emergency shelters to support displaced populations. Building codes and design practices can be adapted to incorporate these functions as part of their initial construction. Most of the features described in the research are not exclusively supportive of fostering a sense of safety and community during

emergency events. Incorporating these elements would also enhance the accessibility of these facilities in day-to-day use. Considering the location of infrastructure and implementing better structural protection concerning geographic hazards and locally applicable hazards (i.e., severe storms) can also support communities by having more options to leverage in the event of a disaster. Intentional urban planning might reduce the likelihood of having to name shelters of last resort that may not be the best option and resulting in relocating evacuees. How we build and plan our communities matters. Building resilience into our decision-making processes at the onset of development can result in less severe impacts, should the worst-case scenarios become a reality.

Intersectional Policy & Standards

There is a need for more work and research to build out policies and systems to recognize and leverage the diversity within our community. Our legislation tends to reflect our societal values. It requires work to more equitably support and address the root cause of vulnerabilities in our communities. By building socio-political and economic systems that lift women and empower them through equitable access to resources, fewer women are vulnerable to gender-based violence. Applying the GBA+ standard to existing systems and disaster and emergency management practices can identify gaps and areas for improvement in the systems that ultimately build our communities and our vulnerabilities. Having those who can speak to the unique needs of women at the table when writing policy and legislation is vital in building adequate support. Unfortunately, women struggle to get a seat at the table, especially those navigating compounding intersections such as race, ethnicity, sexual orientation, and lower

economic status. Ensuring that those populations have representation in decision-making roles is critical when crafting holistically beneficial legislation.

Research

This research project and its findings helped to further expand on the discussions happening in various fields that look at the role that gender plays in influencing human behavior. Below are recommendations to guide those conducting additional research to understand the interaction of gender, space, and gender-based violence, from the perspective of disaster and emergency management. Some of the recommendations come from the findings, recognized limitations of this study, or the limitations of available literature. Overall, given the focused nature of the research method, exploring this research problem using different methods would be beneficial in highlighting additional practices needed to support the entire spectrum of gender identity.

More Diversity in Engagement

This research utilized a mostly binary conception of gender. It did not explore the full spectrum of gender identities and the unique intersectional experiences of those who may identify as members of the LGBTQ2S+ community. The literature and the findings suggest that individuals who identify outside of the cis-gender (i.e., man, woman) and heteronormative points on the spectrum and their sexual orientation are subject to the same discrimination and violence as women, possibly in greater frequency and severity. This pattern would also apply to more culturally and ethnically diverse experiences, especially of those women who identify as minorities within North America. Work that explores women's perspectives and needs in Disaster

and Emergency Management literature tends to be more internationally focused. More research to understand the unique perspectives and needs of all community members to understand better where social and cultural norms and barriers may still exist in our built environment, specifically in our emergency sheltering practices.

Integration of Knowledge

This research project required an amalgamation of knowledge and expertise from many different fields of practice and research to clearly understand this particular approach to shelter and women's resilience. Disasters touch every part of our society. As such, our most effective solutions will be the result of collaborative and integrated problem-solving. Our urban environment continues to grow in complexity, interconnectivity, and interdependence. Looking at problems in silos will not yield holistic solutions and may exacerbate them in some cases. More research on this complexity in disaster and emergency management practices would be essential to further our capacity to support improved practices in mitigation, prevention, preparedness, response, and recovery.

Conclusion

This research determined an awareness and alignment with the literature and practitioners' awareness of the role of space in supporting safety and well-being. There are micro-spatial elements of space that can, if considered strategically, reduce the likelihood of gender-based violence against women. By changing how we consider space to include an integrated approach to emergency shelters that support the "whole woman," emergency shelters can support the catalyst of change that disruption makes way for; recognizing women "as

subjects, protagonists or social agents with power" (Sweet & Ortiz-Escalante, 2015, p. 1829) and empowering women through spatial awareness to shift the dynamics.

Our sheltering standards, such as Sphere (2018), do include gender-mainstreaming language and practices. However, moving down the ladder to more front-line resources, such as the FEMA (2015) Shelter Field Guide, gender-mainstreaming is conspicuously absent. In the cases studied, the Southern Alberta Flood in Calgary (2013) and Hurricane Katrina's impacts in New Orleans (2005), neither of these standards, or any others specifically for sheltering for that matter, were mentioned as being used by participants. This gap was due to no evacuations of this scale in these areas in recent memory. As a result, there was little point of reference to guide the planning for emergency mass shelters. Both events essentially served to demonstrate that 'you don't know what you don't know.' Despite this, practitioners demonstrated a strong appreciation for the need to support an integrated approach to responding to the physical and psychological needs (stress management, emotional support) of those sheltering, which aligned with the ideas presented in Sphere (2018) and the literature. This integration is critical to mitigating violence against women and foster resilience in all individuals in the community. Participants also recognized the social demands for care and privacy placed on women's shoulders. Recommended solutions included tools for women to build social capital and exert some spatial control to reduce their vulnerability to gender-based violence and support recovery following a disaster.

There were several limitations to this research project, and the need for more research to better understand how to support women's resilience in emergency shelters is undoubtedly needed. First, the research methodology used, a case study, does not lend well to generalized

understanding and answers that may be more widely applicable for practitioners (Yin, 2018). Given that gender-based violence in emergency shelters has been noted in research for events worldwide, ensuring that the measures taken support women outside North America would be vital. Another limitation was that recruitment of practitioners who supported the response efforts in New Orleans was challenging to recruit due partly to the length of time that has passed since Hurricane Katrina happened and my geographical location. This recruitment issue limited the amount of data gathered for that particular case event. Additional research to better understand Hurricane Katrina's unique contextual experiences may be needed. Finally, the analysis involved both an inductive and deductive approach. There were significant amounts of literature in specific fields and limited amounts in others. More research to better understand the factors at play regarding gender-based violence and its relationship to space would be beneficial to understand better other aspects of the theoretical framework needed to recognize more nuance in future research.

This research reinforced our ability to adapt spaces. Hence, they are more than simply physical. It reiterated the influential role that the perception of our environment is as powerful as the physical space itself (Chang & Liao, 2015; Gia & Arakawa, 2002; Sphere, 2018; Pain, 2001). Not paying attention to both our physical and perceived environments and how they interact at the onset of an event will make people more vulnerable to disaster impacts. Due to existing social inequalities, women are consistently present in these ranks and thus subjected to further risk of gender-based violence.

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Appendix A

Key Terms of Reference

There are essential terms of reference defined in the context of this study. Many of these terms may have slightly varied definitions and parameters outlined for their application, depending on the context of the conversation. There are four groups of terms: gender, architecture, criminology, and shelter.

Terms related to Gender

All of the terms noted below outline the parameters of the terms used throughout the project. These terms are used in various ways, depending on the project and context of the work. The definitions below rely on peer-reviewed literature, reputable agencies (i.e., United Nations) or a combination of the two.

Gender. Throughout this project, gender refers to the socio-cultural constructs of men and women based on key dimensions such as which resources are available to them, familial expectations and duties, unique daily necessities, limitations, experiences, perspectives, and opportunities (Moser, 1993; see also Hillhorst et al., 2018). Therefore, gendered identities may vary depending on the specific context of a local area. These identities are not static, as they may adapt and change as shifts in the status quo do. These constructs' influence will provide insight into what society expects and permits for each gender, ultimately informing behavior (UNDESA, as cited in Eklund & Tellier, 2012). A key focus in this project is not to see gender as "binary and separate categories" but instead as "relational" (Hillhorst et al., 2018, p.55). This relational perspective is vital because it informs the methodology and approach to developing the literature review. This project will consider and integrate differing gender needs in the spirit of the relational perspective. Doing so will help understand how these needs may overlap, interact and oppose one another, as identified by the research findings. Doing so can encourage assimilation and a more collaborative approach to the collective differing and complementary attributes.

Gender Mainstreaming. The process of gender mainstreaming refers to the integration of women's and men's needs and perspectives. This process is a fundamental dimension considered in any aspect of creating and implementing policies, plans, and programmes across the various spheres that govern modern society (ECOSOC, 1997, as cited in Eklund & Tellier, 2012 pp. 593-594). This practice includes but is not limited to social, political, economic, and environmental realms. Recognizing the systemic and interrelated societal systems at play is relevant to issues with gender inequity, including the more insidious expressions (i.e., gender-based violence). Given the widespread application of gender inequities, addressing the problem is considered a complex problem that requires an interdisciplinary solution (Valerio, 2014; Martino et al., 2020).

Gender-based Violence. Throughout this project, When discussing *gender-based violence* is throughout this project, it refers to an umbrella term under which for any harm that is perpetrated against a person's will; that has a negative impact on the physical and psychological health, development, and identity of a person; and that is the result of gendered power inequities that exploit distinctions between males and females, among males and among females. (Ward, 2002, para. 7; see also Marsh et al., 2006, p. 144).

The inclusion of gender identities of men and women and the components that construct them is critical, as this research examines our conceptual relationship to space and how it manifests in reality. The physical environment will manifest in ways that reflect how the society may use a space, and also who. Thus, if men and women are operating based on specific social constructs, the spaces that they would occupy would reinforce the parameters of the expectations through the physical attributes, access, resources and needs of the primary user.

Structural Violence. There is a widely accepted underlying concept of *structural violence when referring to gender-based violence*; this refers to the underlying components of our social, political, economic systems that generate the lack of equity in our modern society. This inequity is the best means to "determine who will be at risk for assaults and who will be shielded from them" (Wies & Haldane, 2011, p. 3). Understanding that structural violence can manifest itself in how we as a society build out systems and, in turn, our communities. We will discuss key concepts that demonstrate this process in designing the built environment.

Terms related to Architecture & Designing the Built Environment

Below are a handful of terms that help to describe the implicit processes of designing a space. Using these terms is not necessarily heavily prevalent in practice in a formal sense. However, the mechanisms that they describe are well understood and applied throughout an iterative design process. In addition, the definitions draw from peer-reviewed literature in the field of architecture.

Architectural Body. In architecture, designers consider and navigate various scales as they create a space. For example, Gins and Arakawa (2002) explain that the architectural body is the 1:1 scale of how individuals are influenced by and interact with a constructed space. Expanding further, they describe it as "the harkening to any feature or element of the architectural surround, bodily stirrings and promptings included: an articulation of the architectural body" (p. 64).

Architectural Procedure. How we speak about and our choice of words to describe space and its features would inform an architectural procedure or the various components of a space that a designer would orchestrate to construct a space. For example, how someone might describe their home (i.e., light, open, flow) would completely change the design of space compared to another person's description of what they want for their home (i.e., warm, cozy, depth). There is a notion that an

architectural procedure resembles its predecessor, a word, in two respects for a start: First, it is a repeatable item that readily lends itself to discursive use; second, charged with conveying a specific experience or range of experiences, it can be evaluated as to how well it serves its purpose or how effectively it has been put to use (Gins & Arakawa, 2002, p. 57).

These procedures, the described needs of the space, inform the tools at the designer's disposal based on various factors such as culture, building practices, funding, and client needs.

Built Discourse. A built discourse is an overarching way of describing how architectural practices are procedures manifesting from words. These architectural procedures then come together to create the interior room of a building, then the building as a whole, and finally feed into the overall built urban environment as we know it. Diction codes and transmutes into a visual floor plan that manifests a constructed space, the architectural surround. The architectural surround is the constructed physical space that an individual occupies. It is a composition of architectural procedures serving various needs and functions (Gins & Arakawa, 2002).

Individuals may choose to adopt an existing space for purposes other than its intended use due to unique circumstances, as seen when supporting displaced populations during a disaster event. For example, how one person might describe a safe space may differ from how emergency management practitioners approach creating a safe shelter space. There could also be variations in the manifestation of these spaces depending on cultural, linguistic, geographical, and other aspects of individual, communal and national identities. Thus, societal and cultural norms drive the built discourses, informing the architectural design and spaces we occupy, both consciously and unconsciously (Gins & Arakawa, 2002).

Terms Related to Criminology

Criminology developed concepts about space to better predict and understand human behavior in a community. The terms discussed below are usually applied to support the analysis of existing spaces. However, they can be applied to conceptual designs as well. Peer-reviewed literature provided the sources for these definitions.

Crime Pattern Theory. The findings of criminology research for understanding spatial influences on human behavior are helpful because they can help more accurately understand the “micro spatial explanations” of gender-based violence in emergency shelters (Townesley, 2009, p.457). Crime Pattern Theory has a spatial focus that explains the likelihood of crime occurring in specific areas based on their physical arrangement, activity levels, and intended uses (Townesley, 2009; Gerell; 2018). Therefore, societal and cultural norms influence architectural procedures and the subsequently built environment.

Space Syntax Theory. Chang and Liao (2015) defined *space syntax theory* as the concept that the organization of space can inform and “explain human behavior” (p. 2014). It is most commonly applied to the built environment to predict where crime may occur. Space syntax refers to an action or series of expected behaviors that occur in a space with a particular programmed use. Based on data around the experiences of individuals in the events researched, space syntax may also serve to conceptualize how to encourage or discourage behaviors.

Terms Related to Shelter

The terms in this section describe what qualifies as shelter and the different types of shelters that emergency management practitioners may provide for displaced individuals. The different types of shelter tend to vary due to the intended lifespan and degree of complexity of the resources provided. The definitions below are from trusted agencies and peer-reviewed literature.

Shelter. For many lead agencies, such as the United Nations, shelter is a primary need for any individual (UNWomen, 2017, Sphere, 2018). Following the initial impacts of a disaster event, emergency management agencies and those supporting the response will ensure accommodation for individuals who may have lost their access to shelter. Accommodation can take many forms, from repurposing existing buildings, using hotels, erecting tents, or building temporary shelters. There are four distinct shelter categories considered in disaster and emergency management: emergency shelter, temporary shelter, transitional shelter, and permanent shelter. Quarantelli (1995) noted that these categories for shelters are “ideal types,” meaning that each category “does not refer to desirable [shelters], but how the phenomena would look like if it existed in a pure form” (p.45). The length of stay individuals may use the facility for is the primary difference between these categories is the length of the stay that individuals may use the facility. However, there are also notable differences in the extent of planning and time needed for implementation.

Permanent Housing. As the name suggests, permanent housing replaces a dwelling for displaced individuals who lost their homes in the impact of the disaster event (Quarantelli, 1995). The lifespan of this shelter supports the evacuee for the remainder of their lifespan, should they choose to remain there. The shelter becomes a part of the rebuilt community in the recovery stages. The location of the new structure may not be where the original structure stood (Sphere,

2018). At times, communities have to relocate to avoid further hazard impacts in the future (Quarantelli, 1995), such as political, socio-cultural, and economic challenges. Therefore, significant planning and time are needed to erect permanent housing successfully. Often individuals who may be waiting for this type of shelter must defer to using one of the other categories of shelter in the interim (Quarantelli, 1995).

Transitional Housing. Many will often find themselves occupying transitional housing as they await the completion of their permanent housing. This category of shelter is usually akin to permanent housing. It generally resembles housing. Quarantelli (1995) described transitional housing as a category of shelter that "involves disaster victims returning either to their repaired or rebuilt original homes or moving into new quarters in the community [temporarily] – but in both cases, the moves involve occupying permanent, residential facilities" (p. 45). The critical difference between permanent and temporary housing is that this location is not the permanent solution for the individuals using the provided housing. Transitional housing has the same implications for the length of time to plan, implement, and demobilize as permanent housing. Another feature of transitional housing is that household routines typically resume to some degree (Quarantelli, 1995). The extent to which this type of shelter supports daily routines is far greater than Temporary and Emergency shelters with shorter expected lifespans in other shelters.

Temporary Shelter. Temporary shelters are a type of shelter intended to support individuals in the short term following a disaster event. As Quarantelli (1995) observes, temporary shelter "refers to peoples' temporary displacement into other quarters, with an expected short stay" (Quarantelli, 1995, p. 45). These can manifest in mobile trailers, motels, or public buildings converted to provide shelter. The main difference with this type of shelter is that the staff creates some semblance of daily routine, such as providing meals to the individuals (Quarantelli, 1995). Even though the ideal situation for this category is for shorter-term stays, temporary shelters have lasted anywhere from days to weeks, months, and years. These more prolonged periods of use may occur because emergency shelters need to extend their functionality for evacuees (Asgary & Azimi, 2019; Quarantelli, 1995).

Emergency Shelter. The lifespan of an emergency shelter is short while determining other longer-term shelters solutions by agencies involved in response and recovery (Asgary & Azimi, 2019; Sphere, 2018). Generally speaking, this category of shelter involves the least amount of planning and time to make decisions. Emergency shelter protects lives from the hazard in the immediate aftermath of a disaster. With the impacted residents safe and the hazard risk contained, agencies can then determine the path forward as to how to support those displaced (Quarantelli, 1995). Shelters of last resort, such as the Superdome in New Orleans, LA, following Hurricane Katrina, would also be part of this category and that of mass sheltering.

Mass Sheltering. This type of shelter usually occurs in an existing large facility to accommodate many individuals (Asgary & Azimi, 2019; Royal Roads University, 2010). Royal Roads University (2010) defined mass shelters as "transit facilities located in pre-existing structures, such as community centers, town halls, gymnasiums, hotels, warehouses, disused

factories and unfinished buildings” (p. 88). Mass sheltering may occur due to a large-scale evacuation or large-scale impact either in a specific area or to support those arriving from a different impacted area (i.e., refugees).

Appendix B

Interview Participation Letter of Consent

Informed Consent for Professionals Engaged in the Research

Researcher's Information		
School Affiliation	Professional Affiliation	Contact Information
Royal Roads University (RRU)	Calgary Emergency Management Agency	Kerrie Green P: 403-312-6019 E:
MA - Disaster & Emergency Management	Business Continuity & Risk Reduction Planner	kerrie.green@calgary.ca
Thesis Advisor: Dr. Tim Haney (RRU Associate Faculty Member, Humanitarian Studies)		E: thaney@mtroyal.ca
Thesis Committee Member: Dr. Jean Slick (RRU Core Faculty Member, Humanitarian Studies)		E: jean.slick@royalroads.ca

My name is Kerrie Green and I would like to invite you to participate in my thesis research project: How gender-mainstreamed spatial programming in emergency shelters can mitigate gender-based violence against women following disaster events. I am currently a graduate student at the post-secondary institution of Royal Roads University.

The intent of this research is to help understand the factors that may be contributing to incidents of gender based violence post-disaster events, and how emergency management practitioners can plan shelters in such a way that supports the safety and well-being of women throughout the entirety of their occupation of emergency shelter resources. This project is not funded or sponsored by Royal Roads University or Calgary Emergency Management Agency. It is conducted only as part of the Masters' Thesis program, and is required to fulfill my academic requirements. You may verify the authenticity of this project by contacting my thesis advisor: Dr. Tim Haney (thaney@mtroyal.ca).

Your Participation:

If you agree to participate in this research project: How gender-mainstreamed spatial programming in emergency shelters can mitigate gender-based violence against women

following disaster events, you will be involved in a single 1 hour interview scheduled to be conducted in person/teleconference in the months of December-February, 2021, based on a time that works for both parties. This aims to gather input based on your professional experiences and expert opinion regarding gender-based violence and its relationship of incidence to the features of the external environment. This input will be used to help refine the learnings drawn from the systematic review of existing research, as well as to ensure the implications for practice will be holistic and realistically accessible solutions for practitioners to employ in the field. This will ideally serve to help minimize exposure to unnecessary risks for women in emergency shelters, increasing their resilience as they navigate the recovery process following a disaster event.

Confidentiality:

Please know that respect for your privacy is an incredibly important component to this research. The interviews will be recorded for the purposes of analysis and accurate transcription of your input. This interview will be conducted via digital correspondence tools (Skype, Facetime, Google Meetings, Microsoft Teams, Zoom, etc.) due to the COVID-19 pandemic health requirements. If Zoom is the method of communication that is preferred, please note that the Zoom session may be recorded and the data is stored in the USA. Data stored on servers in the USA may be subject to examination by the US government under the USA Patriot Act. While this likelihood is small, I am required to let you/my participants know this possible risk. Permission to record the audio only will be requested prior to commencing the interview to assist with transcription, though it is not required. If consent is not provided to record the audio at the time of the interview, no recording will occur. All data will be kept on the researcher's secured, password-protected computer. Audio recordings of the interview are for the sole purpose of accurate transcription. Personal identifiers will be redacted in the transcription process to protect your privacy, and the files will be differentiated by an assigned unique numerical identifier. Once the transcription process is completed, the audio recordings will be immediately deleted. All audio files related to this project will be destroyed by May 1, 2021. The anonymized transcripts will be kept indefinitely, to support future research efforts in this domain. Your input will be kept completely confidential and anonymity applied for the summarization and review of the data. If you prefer to conduct the interview with another participant, you may do so as long as both parties have provided their full permission and understands that the second participant will be privy to your input and though all data will be anonymized, the second participant who engaged in the conversation may have awareness of the data you provided if used in publications. Please note that all possible measures to protect your privacy will be employed. All data will be stored under a numerical code and no personal identifying information will be associated with or included in the data. Please note that your valuable ideas and opinions will appear in the report itself. However, no personal information such as your name or personally identifiable information will be used to attribute those comments to you. The results of this study will have all input provided by experts presented anonymously, with no mention of professional affiliations or personal information, unless you have indicated specific permission to do so. The results will be made available to you prior to any public release, and should you have any questions,

clarifications or concerns, please do not hesitate to contact me directly by phone (403-312-6019) or email (kerrie.green@calgary.ca).

Release of results:

Please note that if you consent to participate, the results will be made public via the submission of a finished final report to Royal Roads University as a means of fulfilling the academic requirements of my program. In addition to this, the results will be located on Royal Road University's Digital Archive, Pro-Quest and Library and Archives Canada. It may also be shared in published articles, in professional conferences and engagements and through key professional stakeholders' websites and social media, should the results have practical merit for those organizations. In addition, the researcher may also use this research for subsequent projects in the future, however all participants' data will be presented using the above mentioned numerical code pseudonyms. This will ensure that privacy and confidentiality is protected in any future dissemination of the data.

Foreseeable Harm & Benefits:

I do not foresee any harm through participating in this research and hope to create a forum for you to share your expertise and to give it a voice through this research in the Disaster & Emergency Management industry. Your participation is completely voluntary. Should you wish to withdraw your input prior to the analysis of the research results, you are welcome to do so at any time prior to March 1, 2020. If you choose to withdraw your participation and input from the project, any data provided will be destroyed and will not be included in the published results.

Please note that my research project has been reviewed by the Royal Roads University Research Ethics Board. Should you wish to speak to someone with regards to your rights as a research participant, please contact the Office of Research Ethics at ethicalreview@royalroads.ca; 1-250-391-2600 ext. 4425. If you have any questions regarding the project or the interview process, please do not hesitate to contact me at any time and I will be happy to provide additional information and clarity if needed.

By signing this letter and/or replying in the affirmative to this emailed request for your engagement in this project, you are indicating that you agree to participate in the research project based on the terms noted above. Please note that in doing so, you are not waiving any legal rights.

Name: (Please Print): _____

Signed: _____

Date: _____

Please keep a copy for your records. Thank you for your time and consideration.

Appendix C

Interview Questions

The intent of this study will be to identify if there is a relationship between gender-based violence and the spatial programming and elements (i.e. lighting, doors, egress) of emergency shelters. The aim of this research to understand what these relationships may be and then identify if there is a way to organize emergency shelter spaces to reduce the likelihood of incidences of violence against women in these environments. This research project will be combining quantitative and qualitative data using systematic reviews and interview data to synthesize research to acquire a holistic answer.

The interview process will involve the perspectives of professionals across key industries that deal with gender-based violence and human behavior in various ways that the data has demonstrated to be of influence. This data will provide a picture of where practitioners and researchers are, if there are gaps between the two, and what their insights are with regards to the best path forward. This will also serve to review the solutions and/or results of this research and ensure that they account for this data, and will be presented in such a way that they are readily actionable by the practitioners.

Interview Introduction:

The intent of this interview today is to garner insights from professionals in industries that may have experience or knowledge around the influence that a physical environment plays in the incidence of gender-based violence, specifically against women, in emergency shelters ('physical environment' = the features and function of a built space occupied (i.e. washroom, office, stairwell, etc.)). The overall structure of this interview will be semi-structured, with some key questions that also leave space for more explorative conversation. There will be some limitations to exploration, due to time and potential technological constraints (social-distancing practices due to Covid-19) and to maintain consistency between interviews.

Please know that if at any point in the interview you feel uncomfortable answering a specific question, you are not obligated to do so. If you require clarification, please feel free to indicate this and I will do my best to answer your questions. Finally, if at any point, you wish to stop the interview or take a break, you are more than welcome to do so, as your participation is completely voluntary. Any data and information that you may have provided either before, during or after will be permanently deleted from the secure laptop that it is stored on.

We'll go over your completed consent form to ensure that we are both on the same page, and then we will begin the conversation.

Interview Questions & Prompts:

1. Who they are

I'd like to begin by asking you to tell me a little about yourself, specifically your professional experience and areas of focus?

Possible Prompts:

- What is your professional background and expertise?
- What about your field is of greatest interest to you?
- What about this project appealed to you?
- Have you participated in many responses/recovery efforts/planning processes for a disaster event (in either a reactive and proactive capacity)?
 - If so, did you participate in anything related to emergency shelter?
 - Did you have standards you worked to meet? Where did these come from (legislation, policy, best practices, etc.)?
 - What worked well?
 - What didn't work?

2. Our relationship with our environment

I would like to understand your perspective on the relationship that you think may or may not exist between a person and their physical environment. Do you feel that our environment can influence human behavior?

Possible Prompts:

- If no, why?
- If yes, why?
 - Do you think it can vary across genders? Across cultures? How?
 - What do you think might be some of the key differences?
- Are there any specific patterns that you have experienced or witnessed?
 - What do they suggest to you? Why do you think they might exist?
 - If applicable to the participant: When planning out a space for a shelter, what are some of the key aspects you would focus on? Why? Are there any you don't that you wish you could? why/why not?
 - Was gender considered? If so, how? If not, why?

3. Features that might act as a positive or negative influence violent behavior or a lack of safety

Do you think it is possible to discourage certain behaviors with the physical environment?

Possible prompts:

- Why do you think this can be done (or not)?
- How would you approach discouraging bad behavior?
- How would you approach encouraging good behavior?
- What would you describe as a safe space to be in? (i.e. well lit? Warm? Busy?)
 - If applicable to the participant: When considering emergency shelters, does any of the potentially influencing good and bad behavior factor into your planning processes? If so/If not - how? Why?

- If this is uncharted territory...is this something that might be useful? Do you see any need for these types of considerations?

4. Perspective regarding gender-based violence

Do you encounter gender-based violence indirectly through the work you do in some capacity?

Possible Prompts:

- Based on your experience (and specific training), what are underlying motivations for committing gender-based violence (against women)?
 - Is there anything that specifically might increase the likelihood that it would occur? (i.e. lack of resources, security, building, etc.)
 - In your professional opinion, what is the relationship between rates of gender-based violence and the physical environment? Why/Why not? (Floor plans and visuals of architectural features may be provided to support conversation)
 - Professional recommendations
5. Anything else?
- If you could make a recommendation to a fellow professional who had to provide shelter to a large group, what would it be? (focus: safety and support for women)