

AIRPORTS:

Experiencing Borders in Between Spaces

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ABSTRACT

As the population trends continue to demonstrate the growth of the aging generation, it is apparent that this group of people are an increasingly important demographic. The elderly traveller is steadily showing increased interest in air travel. As such, designing travel spaces that support the needs and requirements for the security, comfort, and navigation of the senior population is necessary. The airport environment can be understood as a transitional space that is associated with stress and discomfort because it tends to be unrefined and poorly planned, and is generally regarded by the general public as an area of less importance. As a result, such transitional spaces are confusing to navigate, and are not comfortable for users. This interior design practicum seeks to address this issue through the design of an airport facility that re-evaluates the role of transitional spaces by creating a spatial narrative that connects people and spaces together on a physical and emotional level while addressing concerns of comfort and security that travellers encounter on their travels. The architectural design language was informed by theorists like Paul Virilio (surveillance theory), M. Powell Lawton (the ecology of aging), and Yi-Fu Tuan (theory of space and place). Theoretical research and precedent analysis further supported the development the programme and design of the proposed Winnipeg Airport to incorporate elements of history, place-making, wayfinding, and materiality into a space that addresses the needs of the modern day elderly traveller. The resulting proposed design for the Winnipeg Airport incorporates vibrant colours in a calming space to address wayfinding strategies, reclaimed and local materials that reflect the Manitoban landscape, and repetitive spatial elements that occur on each level both horizontally and vertically to make the space a place.

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Background & Rationale

This practicum explores the relationship between the human experience of transitional interior spaces through the design of an airport from the curb to the security checkpoint and after the checkpoint to the gate beyond. The airport can be defined as a boundary between spaces, a transition defined by the emotive and physical experience of the passengers (Andreu 1999, 56, 59). Transitional spaces are most evident in places that facilitate transportation, but transitional spaces are found in many typologies - reception areas, lobbies, atria, and corridors to name a few. Some design elements that define transitional spaces include columns, bodies of water, entryways, pathways, aisles, trellises, and courtyards. The function of these elements is traditionally meant to ease the path of travel between places. The most popular use of these spaces is to provide a connection between outside and inside. Many transitional spaces have problems with bridging the connection between the inside environment and outside environment, light and dark, are causes of visual discomfort, and are often spaces that are not suitably designed to the functions of the place. In many cases, transitional spaces cause more confusion when navigating through a space due to poor planning, design, and execution. The purpose of transitional spaces needs to be re-evaluated - these areas do not need to be confined to these roles because they increasingly accommodate the separation and flow between interior spaces. Transitional spaces are an important type of designed interior that provides a physical and emotional experience, creating a narrative as people move through the space. They also construct opportunities for flows and pauses that need to be integrated into the design of the airport in order to improve the quality of the travel experience (Cappeliez 2008).

Douglas Karsner points out that airport construction and airplanes became symbols of power following World War II and thus their evolution has contributed to the transformation of cities into major metropolitan centers through economic and social growth (Breihan 2008, 851). However, mass air travel leads to the need for higher levels of security because the space becomes "a suitable target for criminal mischievousness" according to Henry DeGeneste (DeGeneste and Sullivan 1994, 3). Security further adds to the anxiety and psychological stress associated with air travel due to increased scrutiny at security checkpoints and delayed or cancelled flights caused by a variety of reasons including security concerns. In addition, aggressive passengers affect the experience of air travel. According to Joseph Ting, "passengers with flight anxiety who already have fears out of proportion...will now have to contend with random unpredictable acts of violence and terrorism" (Ting, 2004).

With the current political and economic climate, the role the airport is constantly evolving to address the issues of security versus comfort. A survey conducted in 2002 by the American Institute of Architects found that "fifty-five percent of AIA architects say their clients have made building security a higher priority in the last year...and 46 percent say at least one client has ordered implementation of security features in existing buildings..." (O'Shea and Awwad-Rafferty 2009, 13). With the desire for increased security measures, devices like metal detectors, surveillance cameras, security guards, and modification of building walls and windows are methods being implemented to deter possible threats while creating a sense of safety. O'Shea and Awwad-Rafferty point out that security regulations on design increase each year through the growing necessities of life-safety requirements and buildings codes. Imagine the psychological effect this has on the general populace. An interview with a worker demonstrated that security measures could have a reverse effect. O'Shea and Awwad-Rafferty describe the attitude of an employee who feels like he or she works "...in a building marked with a bull's-eye." The worker goes on to state that "I suppose these security measures should assure me, but they actually make me worry. The metal detectors, security guards, blast-proof glass - they're all messages telling us that nobody's safe" (O'Shea and Awwad-Rafferty 2009, 26).

There are apparent characteristics within an interior that affect the perception of the built environment that directly affects the feeling of fear and safety (O'Shea and Awwad-Rafferty 2009, 27). They are:

1. Darkness
2. Unfamiliar environments
3. Presence of strangers and friends
4. Areas that are unkempt

While airport comfort and security is an issue that affects all travellers, a research investigation reveals that the largest growing group who partakes in air travel across Canada is those who are 65 years of age and over. According to Statistics Canada, this group of people who travel by air is growing steadily as shown in figure 1

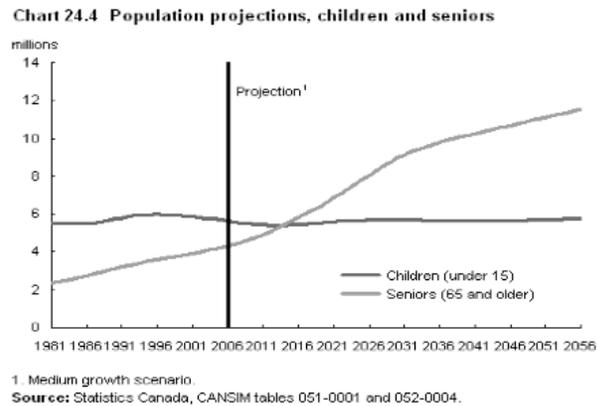


Figure 1. Population Projection of Children and Seniors

As shown in the figure 1, in conjunction with statistics according to a medium growth scenario by age group population projections from 2010 to 2035, Statistics Canada predicts that the population of seniors will continue to increase well into 2030. This increase in population directly affects the travel industry. There has been a steady increase of citizens aged 65 - 69 and 70+ who are travelling for pleasure, recreation, or holiday. A 1996 census by Statistics Canada demonstrates that regardless of the

destination, whether to the United States or other international locations, there is a growing interest in travel for those who are 65 years and over (Statistics Canada 1998). For those who travelled internationally to countries other than the United States, 780 of the 1,097 retired travellers travelled for such purpose in 2008; and in 2010, there were 938 out of the 1,301 persons who travelled for the same reasons. For those in the same age category mentioned above who travelled to the United States for pleasure, recreation, or holiday there were 1,880 of 2,953 in 2008 and 2,539 out of the 3,873 travellers in 2010. Other reasons for travelling included business, convention, or employment and to visit friends or relatives (Statistics Canada 1998).

In addition to the growing aging population comes anticipation of increases in the population of persons with disabilities. In a study conducted by the Government of Alberta, those who are over 65 years of age are showing the most signs of mild to severe disability compared to their younger counterparts. In a survey conducted by Statistics Canada, there were 1,451,840 Canadians over 65 who reported that they had a form of disability in 2001. In 2006, this number increased to 1,757,590. The breakdown of the severity of disabilities is displayed in figure 2.

Degree of Severity	2001 (%)	2006 (%)
Mild	35.7	36.2
Moderate	24.8	23.9
Severe	25.6	26.0
Very Severe	13.9	13.9

Table 1. Level of Disability in Age 65+

Among seniors with disabilities, 76.4% of them reported that their most common disability is limited mobility, followed by pain (Statistics Canada 2007). Although seniors are increasingly becoming challenged with different levels of disabilities, there is a growing trend for this age group to travel. From these figures above, it can be concluded that there is a need to accommodate

the aging population in order to meet their needs and requirements in airport environments. Additionally, airport environments must react to create a comforting and welcoming environment, especially in a space that is unfamiliar to these travellers.

Questions of Inquiry

Several key questions of inquiry were posed as a means to help inform the outcome of this practicum project. They are meant to guide the research, literature review, and design process, and by helping to probe the reasons why this project is significant in modern day society. These questions are as follows:

1. What are the emerging trends in airport design?
2. What design considerations must be implemented in relation to wayfinding, navigation, perception, and experience in a public place for travellers who are 65 years and over?
3. What evidence exists that increased exposure to security surveillance and associated devices affects peoples' experience of public spaces?
4. What existing evidence suggests that interior design can contribute to environments that improve human experience in terms of lowering tension, fear, and apprehension in airport occupants?

Research Methodology

The research methodology used in this practicum will organize the theoretical framework into three over-arching theories that relate to one another with minor sub-heading categories in which key issues that address theoretical perspectives necessary to investigate the scope of this project will be discussed. Forming the primary theoretical perspective is gerontology. Gerontologist M. Powell Lawton studies the correlation between the individual and the environment and derives several key points from environmental psychologist Robert W. Kleemeier who notes that “the aging process as a modifier of the relations between the person and the outside world” is affected by “...the visual environment, the auditory environment, and the thermal

environment...” (Lawton 1983, 349). Reflecting on the purpose of the design and its role in the built environment, how do individuals create an awareness of self and identity in an unfamiliar place and space? How do trends affect the design process and whether individuals of varying age groups react differently to the implementation of security in the built environment? The questions posed above are meant to produce an inquiry process that combines both theory and conceptual ideas that support one another.

A review of literature and analysis will help support an in-depth exploration of key aspects of research and theory for this practicum. Areas of research will focus on the ecology of the aging, security and surveillance in the built environment, and identification with place and space. The outcome of this investigation provides insight on the relationships between surveillance and the body, the retired traveller, and creating meaningful places.

Following this, an analysis of design precedents reviews built projects that have taken into consideration the theories and research that will be explored in this practicum project. The key design elements in these precedents share common goals and principles; and have inspired the project from its conceptual phase through to the final design.

Inquiry Process

This practicum explores how security and surveillance work together with comfort and safety to create a unique spatial experience for the aging traveller. Understanding the needs of the aging population and creating an environment that responds to comfort and safety as well as security and surveillance were the first steps taken to understand the role of design within the interior environment.

The former James Richardson International Airport located in Winnipeg, Manitoba is the site for this practicum. This site was chosen due to the ability to acquire available documentation such as architectural floor plans and site photographs. This former terminal is a typical size of several North American airports in moderate-sized cities. The old airport terminal will allow for the

investigation and exploration of designing the travel experience for the aging population because Winnipeg is a growing city and, compared to the rest of Canada, the city has one of the most balanced, diverse, stable economies in the country (Economic Development Winnipeg Inc. 2010). There are roughly 2.8 million visitors entering Winnipeg annually. They originate from other regions in Manitoba (67.6%), other provinces and territories (22.7%), the United States (7.0%), and overseas (2.6%). In a report by the Airports Council International - North America, although there was a decrease from 3,574,753 inbound and outbound passengers in 2009 to 3,369,974 in 2010, the Winnipeg International Airport was ranked as the 74th busiest airport in terms of passenger travel in North America in 2006 and moved to the ranking of 71st in 2010 (Airports Council International - North America 2010). Taking into consideration the general economic state of recession, the Winnipeg International Airport shows a sustained continual usage by air passengers despite these factors.

Within the scope of the old Winnipeg airport, designing for seniors will be addressed along with other underlying key universal elements associated with air travel - comfort, accessibility, security, and elements of stress and waiting. Although the role of security extends beyond the checkpoint area to the terminal and beyond, there is a constant feeling that every move throughout the airport is being watched and scrutinized. This practicum therefore places some emphasis on the role of security that will nonetheless contribute to the spatial design of the airport interior. The role of security will be integrated into the interior space through design elements that will be experienced physically, observationally, and psychologically. Using design interventions such as retail spaces, lounges, food services, and rest outlets, my interior space suggests an environment that stimulates the senses and reduces stress in an airport. In addition, the proposed practicum project will strive to be a model for future considerations in airport design and planning, especially taking into consideration the growth of elderly travellers in the airport environment. It will also study whether specific responses can be evoked with regard to airport security and surveillance.

This project seeks to promote the need to consider the aging population in the design of an interior environment by integrating spaces - transitional, public, and private with comfort, accessibility, and the elements of waiting through the inclusion of a connection with nature in the built environment. As such it is possible that this project will become a model that can be adjusted

to suit a variety of different locations determined by whether there is a need for this kind of typology. Showcasing a collaboration between architects, environment and geography specialists, and interior designers will demonstrate the benefits of an integrated design process.

Definitions

Disabilities

Persons who reported difficulties with daily activities are considered disabled. This includes those who have health, physical, or mental conditions that affect their ability to perform activities. Types of disability include: challenges with agility, communication, developmental, emotional/psychological, hearing, learning, memory, mobility, pain, and sight.

Severity of Disabilities

The range of severity of disabilities (as defined above) is mild, moderate, severe, and very severe. According to PALS (Participation, Activity and Limitation Survey), the level of severity depends on the frequency and intensity of limitations due to the disability (Statistics Canada 2007).

Security

Security is a state of feeling safe, to be free from harm, anxiety, stress, or fear. Several features that may create this state includes metal detectors, security guards (Merriam-Webster, Incorporated 2012)

Seniors

Refers to the aging community. This includes persons who are 65 years and over. The term “senior” will be used interchangeably with the aging community, elderly, and retired (Merriam-Webster, Incorporated 2012).

Surveillance

Monitoring activity by observation whether through CCTV (closed circuit television) or third party electronics such as a personal camera, cellular phones, notebooks, etc. (Merriam-Webster, Incorporated 2012).

Silent Generation

Also known as the post-war cohort. This includes those who were born between 1928 – 1945 (Schroer n.d.)

Boomers I & II Generation

This includes both Baby Boomers and Generation Jones, a term coined by Jonathan Pontell which refers to a large anonymous generation (The Jones Group 2012) for those who were born between 1946 – 1965 (Schroer n.d.).

Generation 'X'

Sometimes also referred to as the “lost” generation. This includes those who were born between 1966 – 1976 (Schroer n.d.).

Generation 'Y'

Also known as the Echo Boomers or Millennials. This is the largest group since the Boomer generation and includes those who were born between 1977- 1994 (Schroer n.d.).

Generation 'Z'

Born between 1995-present, they are growing up in a highly technologically and advanced environment. They will be more adept with the Internet and other technologies (Schroer n.d.).

Project Scope

As stated above, the purpose of this practicum project is to investigate how the airport can be designed to facilitate the growing aging community in a way that promotes comfort, accessibility, and a sense of place in a space that may be foreign to them. Emphasis on designing for the aging community is driven by the fact that people are living longer on average and when they reach the retirement age of 65 years, trends show that they are likely to travel for leisure. The intention is to create an

environment that caters to everyone but addresses the aging community - their needs, wants, and expectations that will encourage a positive experience in airports.

Through an investigative process, the interior of the old Winnipeg James Armstrong Richardson International Airport will be transformed to emphasize the importance of discovery and the experience of “the journey” from curbside arrival to the departure gate. Emphasis will be placed on the journey through space – the sensory experience for every step from the beginning to the end – versus simply the trip. The creation of a memorable experience along the path of travel will be distinguished by flows and pauses, unique experiences, and choices that lead to the final destination. This is to be differentiated from a trip through the airport, which would be focused on travelling from point A to B on a clearly defined, relatively straight path. In such instances, the surroundings of this trip are unimportant and the traveller is oblivious to them.

This project will address all public areas of the airport – curb to check-in counter to security checkpoint and passport control, to the departure lounge and gates. Areas that will be excluded from the project include spaces that are sensitive and pre-determined in nature. As such, the security checkpoint will be zoned but not designed in detail. Other areas not included are private areas that are required for the airport to function effectively including the basement that houses staff areas, mechanical and electrical systems, and baggage handling systems. Furthermore, this project will also disregard areas like service corridors and offices. The focus on the public areas mentioned above will challenge the existing interior. Acknowledging the historical relevance for the building, the exterior façade will be preserved aside from several minor changes to improve views and daylight penetration. Structural elements and vertical circulation will be maintained with the possibility of modification, if necessary and justified.

Document Overview

This practicum is organized into five chapters and a conclusion, with accompanying materials attached as appendices. The first chapter of this document is intended to provide a brief of the project. Background and rationale provide questions of inquiry what will help frame the investigation. Definitions clarify the meaning intended for the terms used in this project. The project scope and theoretical framework discuss in brief the main theories, subsequent topics, their relevance to the project, and how they can potentially inform the design programme and design process.

The second chapter is comprised of the review of research and theory. These are separated into three major sections, and broken down into subsections that are organized from broad to specific significance. The theoretical topics of “space vs. place”, “security vs. comfort”, and “private vs. public vs. transitional spaces” will inform my understanding of wayfinding and the experience of the journey to provide the context for how the elderly perceive and adjust to space differently than the rest of the population.

In the third chapter, the exploration of five existing projects form the basis of the precedent analysis. The following projects were selected to provide different typologies to study. Each of these projects is relevant to airport design through spatial arrangements and demographic considerations. The Beijing Capital International Airport utilizes innovative building techniques, advanced technology to aid in wayfinding while creating a lasting gesture to welcome each individual upon arriving at the airport. In the case of Arnhem Central Transfer station in the Netherlands, the revitalization of the facility to accommodate all modes of transportation required an ease of navigation throughout the space while at the same time designing for a sense of place and emotive experiences. The third precedent examined in the practicum is Oakbridge Retirement Village in the United Kingdom. This is a residential community that uses open planning to accommodate the elderly, specifically those living with dementia. The objective of this project is to promote wellness, independence, and community. The fourth precedent is the Mirabella at South Waterfront in Oregon that was also designed purposely for the aging community. Creating a safe and secure environment that promotes health, wellness, and friendships through material selection and sustainability were the project goals. North Shore

Waterfront Park is the final precedent analyzed. This project successfully implemented universal design in an outdoor landscape which promotes leisure, recreational activities through socially interactive activities. The park uses nature and activities to form positive memories and emotional attachments with the place.

The fourth chapter details my design programme. This section is broken up into different subsections that analyze the site through the identification of user profiles, contextual issues, the background and history of the building, relevant human factors, building codes, spatial analysis, and functional, aesthetical, and technological requirements. This analysis will complement the Chapter 2 and help guide the design objectives to create a proposed design that is drawn from research, theory, and programmatic requirements.

The fifth chapter shows how I apply the research and programming elements explored in the previous chapters to construct a proposed design that addresses my questions of inquiry and explores the spatial relationship between interior spaces and human experience through flows and pauses, memory and experience, and security and technology for the elderly traveller.

Concluding this document is the sixth chapter where I summarize the key design elements that fulfill the project, as well as design challenges and limitations, and suggestions for additional research studies that could further inform and enhance future projects.

Theoretical Framework

TOPIC: SURVEILLANCE

BOOKS + AUTHOR	KEY IDEAS	THEORISTS
Chapter 2: Theorizing Surveillance: The Panopticon and Beyond Edited by David Lyon	<p>Michel Foucault proposed that the principles of the panopticon served as a model for understanding of the operation of power in contemporary society.</p> <p>Jeremy Bentham proposed the panoptic prison as a way to control social disorder through spatial arrangement and lighting.</p> <p>The panopticon has evolved into the superpanopticon, electronic panopticon, and post panopticon to fulfill shortcomings.</p> <p>The role of mass media has led to the development of 'synopticism' - where the many can monitor the few.</p>	Foucault Bentham
From Modernism to Hypermodernism and Beyond Edited by Paul Virilio & Architecture by Neil Leach	<p>This work approaches architecture as a reflection of human consciousness - this would promote "a sense of disequilibrium and instability". Virilio interpreted this by exploring ideas of oblique circulation to create 'dynamic space.</p> <p>Shifted to look at how telecommunications have the ability to dissolve physical distance. How does this affect control? This translates into the dissolution of the sense of place and the self.</p>	Virilio Staples Lyon
Surveillance Society: Monitoring Everyday Life Edited by Tim May	<p>According to Steven Nock: Surveillance is the paradoxical product of the quest for privacy (21). There is a blur between private and public space as a result. However, this is an issue that is cross-cultural.</p> <p>Technological trend shows that surveillance technologies are becoming less perceptible but more powerful.</p> <p>The role of surveillance is affecting the way people live their lives. At the same time society is shaping technological systems. (25)</p>	

<p>Everyday Surveillance: Vigilance and Visibility in Postmodern Life</p> <p>By William G. Staples</p>	<p>Breaks down post modern surveillance practices into four characteristics (11):</p> <ol style="list-style-type: none"> 1. They are increasingly technology-based, methodical, automatic, and sometimes anonymously applied, and they usually generate a permanent record as evidence. 2. Many new techniques target and treat the body as an object that can be watched, assessed, and manipulated. 3. The new techniques are often local, operating in our everyday lives. 4. Local or not, they manage to bring wide-ranging populations, not just the official "deviant," under scrutiny. <p>Staples refers to these as the "meticulous rituals of power."</p> <p>Staples compare the breakdown of boundaries due to surveillance with the body. He examines methods that surveillance has penetrated everyday life through community policing and corrections, neighbourhood detention centers, house arrest, and in-home social welfare models.</p> <p>Explores the techno-reliant culture and how the reliance on the Internet is paving the way for the breakdown of freedom and provided a gateway for social control (147-149)</p>
<p>Surveillance Studies: An Overview</p> <p>By David Lyon</p>	<p>Points out the shift surveillance has taken to adjust to social and economic changes - utilizing a broader stance to "consider surveillance practices well beyond the nation state..." (54)</p> <p>The response nations take in response to attacks and how this has affected public spaces and in return, the affect it has on the body both physically and mentally.</p> <p>The apparent unawareness of society regarding the depth surveillance has on their lives (189).</p>
<p>Design and Security in the Built Environment</p> <p>By Linda S. O'Shea & Rula Awwad-Rafferty</p>	<p>Addresses the feelings of anxiety and fear are associated with security and whether these security measures are creating the feeling of safety and security.</p> <p>Discusses how interior design and architects need to design for security in the built environment and the importance of seamlessly blending elements of security into the environment while taking into consideration user-centered design.</p>

TOPIC: GERONTOLOGY

BOOKS + AUTHOR	KEY IDEAS	THEORISTS
<p>Theoretical Perspectives on Cognitive Aging</p> <p>By Timothy A. Salthouse</p>	<p>Salthouse describes the effects of aging and how memory plays a vital role in the ability to learn and adjust to unfamiliar places.</p> <p>Explores the ability of the aging to adapt to their space through reasoning and spatial abilities. The increasing number of variables needing to be deciphered leads to a decreased understanding of space.</p>	<p>Lawton Herzog & Markus Kaufman Brandstädter & Greve</p>
<p>The Geography of Aging</p> <p>By Gerald Hodge</p>	<p>Pattern of basic geographic patterns of the aging population and movement of seniors across Canada</p> <p>There are nine characteristics that are needed for designing for the aging population:</p> <ol style="list-style-type: none"> 1. The total population being designed for 2. Age structure 3. Gender 4. Living Arrangement 5. Housing Tenure 6. Cultural Composition 7. Income 8. Health 9. Mobility (transportation) 	
	<p>Although this book focuses on designing for challenges in community environments, it can be adapted to the design of airports and other large public areas.</p>	
	<p>Addresses the issues of obstacles in environments since many places are not “enabling” environments for seniors.</p>	
<p>Multidisciplinary Perspectives on Aging</p> <p>Edited by Lynn M. Tepper & Thomas M. Cassidy</p>	<p>Looks at how design can impact all users, especially the aging, to improve mobility, improve attention to cognition and memory support</p> <p>Applying design elements important to dementia care may contribute to a social and physical environment that can evoke emotion, motion, and response.</p>	

TOPIC: SPACE AND PLACE

BOOKS + AUTHOR	KEY IDEAS	THEORISTS
<p>Space and Place: The Perspective of Experience</p> <p>By Yi-Fu Tuan</p>	<p>Questions what space is, how it is different than place and how to create a place or space.</p> <p>Another point discussed is how to create an emotional response</p> <p>Knowledge and space works together to become a place</p> <p>Space is transformed into a place when it is given meaning and definition.</p> <p>Space has the ability to create a sense of freedom, achievable through machinery and tools. However, this must take into consideration cultural differences.</p>	<p>Augé Yi-Fu Tuan Certeau Cresswell</p>
<p>The Unknown City</p> <p>Edited by: Iain Borden, Joe Kerr, Jane Rendell, Alicia Pivaro</p> <p>Chapter: That Place Where: Some Thoughts on Memory and the City</p> <p>By Barry Curtis</p>	<p>Timelessness enables the memory to preserve time - "the relationship of past and present, nature and culture, the ceremonial and the everyday, the appearance and the reality" (57)</p> <p>According to Marc Augé, non places are areas which involve "elements of identity loss and role-playing" (62)</p> <p>Stresses the importance of memory as the primary component in the creation of place. The key is to preserve and stimulate these memories within a space which will contribute to a narrative that then leads to the creation of experience</p>	

Table 2. Theoretical Framework

Introduction

The design needs, goals, and expectations for this project must address three things:

1. Elderly travellers and their perceptions of security, surveillance, and spatial awareness
2. Creating a comfortable and unique experience through memory, emotional response, and identity
3. Encouraging independence using technology and freedom

All of these factors affect the decision of whether or not to travel. Economic, social, and psychological factors all play a role in the decision-making process. On the one hand, reasons for travel include holiday, leisure, relaxing, and visiting family and friends. On the other hand, deterrents to travelling include stress, anxiety, health, unfamiliar environments, political and economic concern, and disability. In the following section, three theories will be explored:

1. Surveillance Theory
2. Space and Place
3. Ecology of the Aging

Surveillance Theory

"...the idea of a truly private life is already an illusion. Every street in New York has a surveillance camera. Each time you swipe your debit card at Duane Reade or use your MetroCard, that transaction is tracked. Your employer owns your e-mails. The NSA owns your phone calls. Your life is being lived in public whether you choose to acknowledge it or not."

- Emily Nussbaum (2007)

A Surveillant Society

Imagine a cellphone. All models now include a built-in camera. Its original purpose was to allow users to capture personal moments in time. These devices are now being used to capture public acts and people who are strangers to users. There exists a possibility that the recorded materials are shared either among friends or with anyone through the Internet by means of social media websites like YouTube, Facebook, and Twitter. The concept of self-surveillance and threat of digital exposure within a highly technologically-reliant society can blur the boundaries between public and private freedom. Such social environments breach the physical body and our sense of personal surveillance.

The idea of surveillance is formed with the intent to enhance "efficiency, productivity, participation, welfare, health, or safety" (Lyon, *Surveillance After September 11* 2003, 23). It was meant as a form of governance, not overbearing control. In the twentieth century, however, surveillance has been transformed through readily available mobile devices because of technology. In essence, human beings have become "siphoned as data...in surveillance systems" (Lyon 2003, 27).

According to David Lyon, surveillance can be broken down into five processes: rationalization, technology, sorting, knowledgeability, and urgency (Lyon, *Surveillance Studies: An Overview* 2007, 26-27). This is where the application of

surveillance is justified, applied, grouped and analyzed, and action is taken in response to the findings. The airport is a prime example of where surveillance is apparent, through the check-in counter, security zone, and Customs and immigration borders. It can be compared to policing and crime control within a city. In both instances, people are routinely placed under surveillance when they are suspected of carrying out an offence. However, although this portion of surveillance is visible to the eye, according to Lyon, surveillance begins before one reaches the airport. It begins during booking a flight: Reservation data from the booking reveals important facts like health condition, food preferences, and previous travel history (Lyon 2007, 11). This is important because who has access to our personal information can affect choices and freedom of movement. For example, the United States and Canada have implemented a no-fly list made up of persons deemed "suspicious" that is intended to maintain aviation security and protect all passengers.

The increasing use of individualized self-surveillance is a result of social media devices in an increasingly surveillant society. While the use of mobile devices has pushed the boundaries of what defines personal freedom, this can contribute to theory based on the panopticon discussed by Michel Foucault. According to David Lyon, this is achieved through establishing and reinforcing social inequalities (Lyon 2006, 29). The panopticon is the idea where "the few watch the many" (Lyon 2003, 20) and those under supervision are under the impression that "...the gaze is unwavering" (Lyon 1993, 657). To further understand this model, secular utilitarian social reformer Jeremy Bentham translated this into prison planning in the eighteenth century. Planning the prison using a semicircular pattern, Bentham achieved the affect that made it appear that the guards had a constant view. As a result, he was able to establish a relentless unconscious sense of security and control over inmates through social inequity. The architectural plan for the prison incorporated curvilinear forms that seemed to eliminate the possibility of blind areas. It appears that the goal for Bentham's prison was to create the ideal panoptic setting where people do not have to be present to create a sense of control. Best summarized by British social theorist Nikolas Rose, the panopticon was "the diagram of a political technology, one that was individualizing, normalizing, based on perpetual surveillance...enabling the government of multiplicities, reducing the resistant powers of human bodies at the same it maximized their economic and social utility" (Rose 1999, 187). In comparing Bentham's prison from the nineteenth century to modern society, the idea of the unwavering watchful eye was

restricted to visually controlled spaces while advances in technology provide the ability to achieve the same result without physical presence. While this form of social control has impacted the lives of offending citizens, it has nonetheless grown to include all citizens who are knowingly and unknowingly monitored.

This form of social control extends into the body. It affects how people experience a space psychologically and physically as the body becomes the target of "knowledge and social control" (Staples, *Everyday Surveillance: Vigilance and Visibility in Postmodern Life* 2000, 125). Foucault's panopticon is based on visibility and it has been modernized in the twenty-first century with the role of mass media and technology paving the way for electronic surveillance and its penetration into all aspects of society. It is interesting to note the corresponding complex relationships that have developed from the initial idea of surveillance. From the earliest inception of the panopticon and surveillance from centuries ago, the intent was to monitor and "correct abnormal behaviours" (Hadjiyanni and Kwon 2009, 8). However, because surveillance has a tendency to blur the boundaries between private space, public space, and activities, it challenges our comprehension of space. The panopticon has influenced other theorists like David Lyon and William Staples.

These forms of control manifest through anxiety, alienation, and resentment - all of which detach the body from the self and others. Staples states that "technologies or practices that permit our bodies to speak the truth, whether we want that voice to be heard or not, or alternatively, that control and restrict our bodies from being what they are, generate these very emotional states as they detach us from ourselves" (Staples 2000, 125). The practice of surveillance is itself an urban experience and at many times, it is regarded as insensitive. Ironically, the public's perception of surveillance is the concern that "someone is watching rather than 'someone is protecting me'" and the notion of social control associated with this subconsciously and consciously controls human behaviour (Hadjiyanni and Kwon 2009, 6). It appears that the point in which comfort becomes uncomfortable is a fine line that could be addressed subtly. It becomes apparent that the drawback of constant surveillance is the development of feeling discomfort and creates a concern that privacy may be lost. From a fundamental perspective, the idea of surveillance is a direct action in response to a perceived threat. Thus, the use of electronic surveillance systems in the built

environment creates conflicting emotions with the human psyche. At one end of the spectrum is the feeling of security and at the other end is the uncertainty about who is doing the surveillance, if the information collected will be abused, and whether it is an effective tool. With the importance of electronic surveillance in the twenty-first century, especially after September 11, 2001, and its primary role in preventing similar tragedies from occurring, society is becoming overexposed to many variations of the security measures put in place to keep human safety a priority. This separation of body and self is the continual struggle that results from surveillance penetrating every aspect of our daily lives. In essence, the underlying ideas of the panopticon can be seen in almost every aspect of society.

The Overexposed Society

With technological advances in the twenty-first century, William Staples stresses how easy access to information has become as a result of blurred boundaries between the "once taken-for-granted meanings, symbols, and institutions of modern life..." (Staples 2000, 33). The role of surveillance, along with our reliance on technology, has immensely helped shape contemporary social existence as a result of a post 9/11 world. This is apparent with socio-cultural shifts, our reliance on technology and our adoption of it for our personal use in surveillance. Devices equipped with GPS or personal monitoring equipment like home surveillance cameras such as 'nannycams' allow us to keep watch to ensure our safety and well being. The evolution of the panopticon has shifted into addressing post-modern surveillance and social control. William Staples investigates how surveillance has the potential to influence social or cultural behaviour by outlining four characteristics of postmodern surveillance:

1. They are increasingly technology-based, methodical, automatic, and sometimes anonymously applied, and they usually generate a permanent record as evidence.
2. Many new techniques target and treat the body as an object that can be watched, assessed, and manipulated
3. The new techniques are often local, operating in our everyday lives.
4. Local or not, they manage to bring wide-ranging populations, not just the official "deviant" under scrutiny.

(Staples 2000, 11)

Cultural Theorist Paul Virilio investigates 'dromology', which he defines as "the study and analysis of the impact of the increasing speed of transport and communications on the development of land-use" (Armitage 2000, 74). From an architectural standpoint, traditional architectural constraints are now being challenged by advances in technology. This has redefined the method of entry into a city where the gateway is no longer the railway station or the port but the airport. The entry point into a city used to be a symbolic entrance but in response to terrorist attacks the airport became the testing grounds for surveillance. Electronic surveillance transformed this gateway through invisible forms of control and has led the integration of technology into society to "ensure maximal freedom in travel" that was initially meant to restrict movement in "maximum security cell-blocks" (Virilio 1991, 11). Virilio interprets this interjection of silent surveillance as an interruption in the continuity of time where it not only serves as a form of organization but also as disorganization of the urban environment. In essence, surveillance in the urban environment has reduced the boundary between near and far and public and private, and has turned the "space of a constructed social fabric..." into "the surfaces of property allotments" (Virilio 1991, 14).

This has been made possible with social accessibility methods like the Internet. Since the inception of the Internet, forms of communication and data storage have been rapidly digitalized. The Internet isolates the body from the self, virtually simulating a world that decentralizes people from the physical world. It has provided opportunities to exchange information, socialize, consume, become involved in cultural, political, and economic debates and developments, learn, and to experience foreign places.

The Internet has also affected placemaking with its inexhaustible and readily available supply of information. It is so immersive that it "compresses time as well as social and geographic space, destroying the experience of distance..." (Staples 2000, 129). It has been suggested by varying theorists that these new sources of media such as video, the Internet, and television, have "severed the links between social and physical space" through the ambiguous delineation of public versus private and here versus there (Staples 1997, 33). The amount of personal information that people freely and willingly distribute on the internet has become a source to gather information anonymously and to watch individuals with or without permission. Progressing from Jeremy

Bentham's panoptic prison, these forms of social media and exposure have provided a framework for individuals, unconsciously imposing accountability on lifestyle and behavioural decisions. Essentially, the body becomes the new form where its functions, processes, characteristics, and movements are prone to regulating, probing, and measuring (Staples 1997, 35). These forms of surveillance, discreetly gathering evidence and knowledge, are becoming an integrative part of our daily lives. It is interesting to point out that while we, as a society, feel our privacy has been intruded upon when surveillance is visible or apparent, when it comes to personal recording devices, we are able to cast aside these feelings. Instead, our fascination with these devices is not their ability to address personal security or comfort but rather how we are able to perceive ourselves and how society perceives us. How have we allowed such actions to become so integrated in our daily lives? The possibilities that the internet has provided humanity has reinforced our dependence on it. The theory of technosocial systems has played a key role between society and technology. Technosocial systems refer "to the circumstance that the web cannot be defined without connection to the human social realm" (Raffl, et al. 2008, 606). It is the social characteristic of technology that allows society to communicate with each other and according to Raffl, the web as a technological tool that through three developmental stages has enabled society to:

1. Use technology as a tool for thought
2. Use technology as a medium for human communication
3. Experience human co-operation through social networks

(Raffl, et al. 2008, , 609)

An issue that consistently arises is whether technology has been engrained into society to the point that society has become dependent on it for survival. Is this a cultural issue dependent on geographical location and demographics? And is there a societal push to encourage all members of society to use technology? In a study carried out by Mark Srite and Elena Karahanna investigating the influence cultural values have on the acceptance and use of technology, their results of measuring cultural values to individual levels of analysis show that culture plays a significant role in the acceptance of technology. However, this level of influence is dependent on the ability for individualism through the decision-making process and the requirement of technology for work. In such cases, the greater the amount of individualism exhibited and the greater the need to use technology in

workplaces, the higher the level of acceptance for technology. The results of this study indicate that technology is becoming, if it has not already, integrated into all aspects of life. The trends of technological advances have changed how people live - especially in terms of transportation/mobility, communication, health, workplace, and leisure activities. While the integration of surveillance in the urban environment has blurred the boundaries of space and place, it is important to address the challenge in redefining these boundaries so the urban figure is able to inhabit a designated place with ease.

Place vs. Space

Space is amorphous and intangible and not an entity that can be directly described and analysed. Yet, however we feel or explain space, there is nearly always some associated sense or concept of place. In general it seems that space provides the context for places but derives its meaning from particular places.

-Edward Relph (Cresswell 2004, 21)

Imagine visiting places that are unfamiliar to us, such as a museum, an art gallery, a new city, or an unfamiliar part of the city. Such foreign spaces are unfamiliar to the human senses. In such places, we find excitement in the discovery of space and in finding objects and areas that remind us of places that are familiar and comfortable. Through this process, the space where we were once lost becomes embedded in our memories and thus these spaces are transformed into places. The airport terminal acts as a space of transition where travellers pass through either a point of arrival or departure. Defined by Marc Augé, the terminal is not a place since it is defined as "relational, historical and concerned with identity..." (Augé 1995, 77). Space, then, becomes a place of memory where there is no relationship to earlier places. By this definition, the airport is a non-place. According to Augé, transit points and temporary nodes are non-places that are in themselves a true measure of time where the traveller is in a position of being in contact with an image of themselves (Augé 1995, 79).

The concept of place and space is similarly investigated by French philosopher Michel de Certeau, who identified space as a place that is visited often by an "intersection of moving bodies" (Augé 1995, 79). "Space, as frequentation of places rather than a place..." introduces the idea of a journey that a traveller undertakes that is merely a node also frequented by other travellers as a point of being in between places. Thus, this space becomes a non-place (Augé 1995).

Meaningful Places

There is a strong relationship between space and place, however, where the narrative helps push space to become a place and vice versa. In these areas, especially the airport terminal, it is vital to determine the factor that connects people to the space they are passing through. This is achieved through the integration of words and text that create a landscape that provides travellers with a sense of place. The airport terminal acts as the space that creates the initial relationship between the traveller and his or her destination. This node plays a key factor in providing the initial impression that has the potential to positively or negatively influence the place of visit. The airport terminal is described by Augé as a "non-place of supermodernity" that is defined by descriptive words that establish "the traffic conditions of spaces in which individuals are supposed to interact only with texts..." (Augé 1995, 96). Integrating text into the design of the space becomes a fundamental element to create a contemporary landscape. The challenge is to create a landscape that becomes a gesture that creates a sense of place and identity for the travellers within. It is vital to create a sense of identity for the traveller because as they cross between places and receive textual or verbal instructions, these non-places strip all sense of relations and create an atmosphere of solitude and similitude.

In creating an airport terminal, travellers who are in between places, in addition to other travellers who are there at that a specific point in time, combine together to create a sense of identity in the space that is unique to each individual and not repeatable. According to the book *Non-place*, the importance in creating a meaningful space within a place is the meanings and emotions that become associated with it. In addition, whether a modern space or not, there are historical meanings that become the backdrop for design, that act as a record of time. The design of the space, the materials, form, and spatial planning link directly to the experience and establishment of the non-place. In the end, it is the characteristics of individual solitude, attitude, and self-consciousness that represent the idea of place and space. In the airport, such transitional areas between the public and private become non-places as described by Augé. The relations in this space become connected with purpose similarly to how anthropological places are connected through social interactions, that could be a key aspect for sense of security of the older people. Space and place are also defined by functionality where the activities that occur within allow the traveller to add a layer of meaning to the space.

In a space not his home, the passenger passing through a non-place is lost in a foreign place that is unfamiliar. Augé states that this passenger creates a sense of self through the anonymity of motorways, international products in supermarkets, and hotel chains (Augé 1995, 106). Although there are constraints placed upon passengers in non-places, these spaces are so often frequented that they create an experience between the passenger and public authority. The idea of private and public space is challenged in all aspects of the airport. Traditionally, private spaces are considered areas that allow for intimate or personal events to occur. Such places are usually familiar to the human body and mind because of the associations of security and comfort that accompany it. In the case of the home, a toddler sees place as the location of nurturing experiences. Although an older person finds comfort with objects in the home, more importantly, he or she forms attachments with others. In interpreting the concept of zoning in the home and applying it to the airport, the airport itself is like a community that accommodates mass transition. However, even a public space can be broken down into three zones. These are:

1. Personal
2. Private
3. Public

Although it is a large public space, the airport can be broken down into three zones mentioned above. The personal zone refers to places that provide opportunities for alone time like services, or rejuvenation areas. The private zone should be considered as areas that allow travellers to socialize, such as airport departure lounges, retail outlets, and restaurants. Lastly, the public zone could be categorized as all areas that accommodate transition like pathways and circulation. These zones also act as boundaries that deal with crossing thresholds and act as a social and spatial ordering device in the public realm.

Boundaries

Borden suggests that the boundaries that identify the separation of space not only deal with crossing thresholds but act as social and spatial ordering devices in the public realm. The relationship between form and objects directly affects space planning. This

defines boundaries as "permeable, temporal and political markers of bodily negotiations" (Borden 2006, 49). These boundaries can differ in their nature and affect space and those in the space differently. While some borders are ambiguous, physical separations occur through cultural and social differences. Borden states that:

"Architecture is a medium and not a message, a system of power relations and not a force, a flow and not a line" (Borden 2000, 224).

Buildings have the opportunity to create highly personal experiences for each individual. The construction of these buildings is based upon many factors such as history or culture. Successful elements are then applied to other similar building typologies to be duplicated over again at another site through another medium where it will be experienced by other people. The boundaries within these spaces are not just defined by walls or partitions. These aspects encompass a wide range of factors like gender, age group, cultural background, and social status that can pose as barriers to entry in some cases. In the case of the Holy Trinity Church in London's Kingsway in Holborn, a painted blue line that is three meters high shields the front façade from the view of passersby. In essence, the blue line has created a boundary that discourages those who are homeless from using the church as a shelter. While this physical separation delineates a boundary between space and people, and the unwanted and wanted, it can be perceived as a border between the private and public domain. The role of the blue line at Holy Trinity is much like a boundary whose purpose is to serve as a form of control in which "social relations are challenged, controlled and formed through architectural materiality" (Borden 2000, 226). While this is a method that addresses boundaries in an abrupt manner, the approach can be made ambiguous through subtle design interventions, spatial arrangements, careful visual transparencies, and psychology.

A case study that exams this methodology is Broadgate in London. where space is organized and offices, shops, and restaurants all have a similar treatment to encourage an elite demographic. While not visually noticeable, service corridors are underground to hide from view the personnel that maintain the area. Although there appears to be diversity based upon image and

impression, in reality the integration of access control points through closed-circuit television, turnstiles, and identity cards constructs a boundary of accessibility to the public. At Broadgate, although it is accessible to the public during the day and night, the human psyche is challenged as people pass the gate thinking "Should I be here, and now? Do I have the right of passage?" (Borden 2000, 233). The means by which boundaries are created at Broadgate can be applied to the spatial design of the airport, manipulating the interior so that "...space, temporality, body and identity are mutually confronted and constructed..." (Borden 2000, 233). The human psyche is affected as a result of anxieties "...expressed in the desire to erect and maintain spatial and temporal boundaries" (Sibley 2001, 108). Such boundaries help us organize space mentally and provide directionality that allows abody to maintain control. In the twentieth century, boundaries are areas where public and private mix that extend from the interior environment to the urban setting as well. How did boundaries come to exist in society? According to Sibley, boundaries are a manifestation of comfort and discomfort that are a direct result of the unknown versus the known. This pertains to our perception of social and cultural bodies of space. Without these boundaries and borders, "the world can only be confused, neurotic, and dominated by fear and aggression" (Andreu 1999, 59). Within the airport environment, boundaries are evident throughout as a form of organizing space and creating order while at the same time, the airport is a site of passage from one country to another. While boundaries in the airport are also used as screening devices, the terminals are "places of change and discovery for each individual" (Andreu 1999, 61). Boundaries are inevitable in any environment and the key is to create an environment that communicates the same language to create a similar experience for all users.

Memory

The history of a place, according to Cresswell, is important to create a sense of place by evoking memory. He claims that memory and place are interconnected. Memory helps support and construct the meanings associated with place, as "an alert and live memory connects spontaneously with place, finding in it feather that favor and parallel its own activities" (Cresswell 2004, 86). Philosopher Edward Casey compares the memory of place with the physical interaction of a historical landscape to support his argument that memory is place-supported. Several cases where memories are associated with specific geographical locations

are discussed in the book *Place: A Short Introduction*. In the case of the Tenement District in the Lower East Side of New York, buildings that served as the first dwellings for immigrants were poorly maintained with constrained living spaces. The lack of facilities was most likely non-compliant with the building codes at the time. Other buildings like museums or monuments that preserved the memory of achievement can be contrasted with this. The Ellis Island Immigration Museum showcases immigration in America as a story of success and opportunity. Countless names are inscribed along the Wall of Honour to celebrate immigrants and ancestors that then become a part of the memory of the place. Both of these typologies exemplify the ability of place to "make the past come to life in the present and to thus contribute to the production and reproduction of social memory" through the passage of time as well as memory and movement (Cresswell 2004, 87). One common theme that occurs throughout indirectly mentioned by various theorists is that memory is involuntary and momentary, and therefore it is not easily forgotten and is prone to stimulation. It can be questioned why memory plays such an important role in interior design. Barry Curtis, a cultural theorist, research director, and emeritus professor, investigates memory at a larger scale: memory and the city. Despite the size of the scope, parallels can be drawn at a smaller scale since the idea that "there is a well-established relationship between memory and narrative" is applicable at both scales (Borden 2000, 66).

The airport, just like any other location, is a place where people engage in place-making activities. Despite that its space is a transitional boundary, it is a place where passengers attempt to assert their own identity. Creating a sense of identity relies on memory to support and construct the meanings associated with place. In each circumstance, according to political geographer John Agnew, there are three fundamental aspects of place that create a meaningful location. These will evoke the senses and provide opportunities for all individuals to create relationships and memories:

1. Location
 2. Locale
 3. Sense of place
- (Cresswell 2004, 7)

Although many people pass through airports when travelling, whether departing or arriving, this transitional space is housed within a building that has a fixed location. The locale refers to "the material setting for social relationships" (Cresswell 2004, 7). In the case of this project, the public, private, and spaces in between will provide opportunities for all individuals to create relationships and memories. Sense of place refers to the emotional and psychological attachments that become associated with a place. While Agnew does not comment on the type of attachments that become associated, it can be assumed that either a positive or negative experience will affect the type of emotional connection, but both of these will still result in evoking a sense of place through memory. An interesting point is brought up by Cresswell: the idea that place is an aspect of the way we choose to think of it (Cresswell 2004, 10). It is defined by personal interpretation and what each individual deems as important and unimportant. In this way, we as humans attach meaning to a space, whether intentionally or not. Cresswell refers to Yi-Fu Tuan and Edward Relph as the originators of place geography. Tuan claims that places become defined through human perceptions and experience. Tuan originated the term 'Topophilia' to explain this theory and it refers to the "affective bond between people and place" (Cresswell 2004, 20). This bond is essential in creating an emotional attachment with a place. This attachment with place can translate into the airport environment by designing for a positive experience. Place and space must support each other to reinforce emotional attachment. Space is an area of movement and flow while place is where pauses and rest occurs, according to Tuan (Cresswell 2004, 20). It would seem that elements of "home" become place-making opportunities. Examining the elements that make the home a place and drawing parallels can provide inspiration and elements that are transferable to airport design and planning. In addition, the humanistic responses that occur construct a significance of place with individuals. By doing so, place will be thought of as a diverse, ever-changing environment where bodies and objects flow harmoniously.

Similar to how place and space are discussed by various theorists, the airport is a point of arrival or departure and the areas within define it as a place through the flows and pauses that occur. These transitions in space and place should create boundaries that integrate effortlessly to support public and private areas. Phenomenologists approach place by asking what defines a place as place. Finding a response to this question involves an investigation of how humans perceive and understand the world around them. Before the design process for space and place can begin, methods in which people interact with their environment should

be understood and researched. Some theorists like David Seamon have investigated the role of home and the significance it plays in creating an environment that enforces a 'safe place' that allows people to foster their own identities. According to Seamon, "home is an exemplary kind of place where people feel a sense of attachment...as a center of meaning and a field of care" (Cresswell 2004, 24). Geographers expanded on Martin Heidegger's notion of a dwelling and discuss the home as a place that frames our understanding of outside spaces. Since the home is an intimate area, it creates the fundamentals for the manipulation and control of space and place that represent our comfort range. However, what the comfort range is and why there are elements that confine it to a specific geographical location is different from person to person.

Contemporary social scientist and geographer Doreen Massey examines the transition of place through a continually changing modern world. She challenges the definition and role of place and argues that it is an event "marked by openness and change rather than boundedness and permanence" (Cresswell 2004, 40). In the paper 'A Global Sense of Place,' Massey questions the meaning of place as a sense of progressiveness. With cross-cultural and social interactions growing on a global scale thanks to air travel, Massey contemplates whether the sense of place is lost. Losing a sense of place leads to insecurity in a society that people draw security, stability, and peace from a strong sense of place.

Another issue that arises from intercontinental travel and social intermingling is the problem of defining regions to which people can relate. With airports, the design challenge is to define regions within a space that cater to a wide range of flow and pause, creating a sense of place for travellers. The multiple levels of identity evoked by regions will add complexity to the experience of the space. The boundaries that these regions define will distinguish private, public, and transitional spaces that are constructed on an understanding of social relations and experiences. However, it is equally important to acknowledge that difference in gender and culture will affect the experience of place and space. Massey reveals that creating a sense of place relies on comprehension to create a sense of character within which people will then be able to link "to place(s) beyond" (Massey 1994, 9). In turn, creating a sense of character will promote and establish the importance of place as a site for interaction and multiple identities to manifest. One element of place that should be considered is history, which accounts in part for the perception of space and how

it is understood. Moreover, the overall design should be thought of as a place that encourages the growth of memory and positive experiences. The significance of memory, can be concluded as one of the most important factors in the creation of a place.

While the city is "...a densely coded context for narrative of discovery and the recovery of experience" that allows people to build relationships with one another, with signs, and with surrounding buildings and districts, it is the role of the designer to translate these ideas from a large scale to a smaller scale (Trova 2009). This explores how opportunities for memory, place, and relationships can be established in such a transient place. Experience, like memory is affected by feelings, thought and sensory perception. Yi-Fu Tuan examines the role of sensory stimulation with architecture and memory. According to Tuan, although the modern architectural environment may be visually appealing, the absence of personality can be attributed to sensory dissociation (Tuan 1977, 11). This can be simple as the ability to physically stretch out to create an awareness of space, since "space is experienced directly as having room in which to move" (Tuan 1977, 12). To create a sense of space, the experience should affect touch, smell, taste, and hearing which then serves to enrich the place. Tuan stresses the importance of sensations as these can effectively translate into the character of an environment, the formation of memory, the perception of familiarity and comfort through which an awareness of space is constructed. The level of comfort is closely related to how we as humans extend our freedom of movement from our bodies to the environment around us.

According to Tuan, in North American culture, spaciousness is the sense of being free from constraints. It alludes to the future, growth and invites action. The downside to this, which is a concern in large public spaces like airports, is the risk of exposure and vulnerability. Two important issues are expressed by Tuan:

1. The feeling of spaciousness feeds on contrast
2. Culture and experience strongly influence the interpretation of the environment

(Tuan 1977, 55)

Both of these concepts explain the relationship of the body with the environment. It has the potential to influence rationales in the interior design of any public space, to be aware that space is a highly interpretive milieu. In addition to the interpretation of the environment, the amount of familiarity and unfamiliarity in a space is dependant on visual cues. It is when the space becomes familiar that it has become a place.

The challenge that must be addressed in the airport is the need to create a sense of understanding through spatial relations within a space. To do so, the architectural language of the built environment "...has the power to define and refine sensibility. It can sharpen and enlarge consciousness" (Tuan 1977, 107). The elements in the space should, especially in the framework of the airport, emphasize the comprehension inside through the horizontal and vertical planes. Tuan explores several different examples of building types, from the Pantheon to a residential dwelling in Indonesia. In each of these places, the spaces within are designed on a heirachy level of social importance and functionality in addition to the symbolic role of nature. In essence, these spaces express rythmic patterns that reflect the characteristics of culture. The changes in society and technology in this modern age have greatly influenced the ways in which people live. The ease of mobility has prevented people from creating lasting connections with place, thus our "experience and appreciation of place is superficial" (Tuan 1977, 183). The amount of time we spend in a place affects our impression of a place. This explains why historical buildings and monuments have a greater sense of place than modern buildings. It also justifies the need to create a place that references historical elements as they help to anchor place, space, and time. Therefore, it is important to understand the demographic. Considering the relationship between time and space and to create a sense of understanding through spatial relationships, and to create lasting connections that will affect our impression of a place, several design considerations can be examined in relation to this project:

1. Flows and pauses delineate movement through space
2. Our bond to space is dependant on time
3. Creating a sense of place depends on experience and can be manifested deliberately
4. Interiors that related to historical elements have the ablity to create a sense of place

Furthermore, Tuan poses questions that designers should consider with respect to space and place. Some of the questions relevant to airport design are listed below:

1. What connection is there between space awareness and the idea of future time and goal?
2. How do we describe "familiarity," that quality of "at homeness" we feel towards a person or place?
3. What kinds of intimate places can be planned, and what cannot - at least, no more than we can plan for deeply human encounters
4. Are space and place the environmental equivalents of the human need for adventure and safety, openness and definition?
5. How long does it take to form a lasting attachment to place?

(Tuan 1977, 202)

While the idea of place and space has been viewed as separate entities that are related - place acts as a boundary for the space within. Tuan expresses place as an object, the notion that place and objects define space, thus creating an association with personality.

The masterplan for the concourse and terminal expansion at Dane County Regional Airport in Madison, Wisconsin is based on the theme of creating a sense of place through regional inspiration like local architectural style, native landscape, and places that people create significant connections with. For example, the design aesthetic draws from the style of local architect Frank Lloyd Wright, evident by the use of horizontal and vertical lines throughout the airport. Attention to detail is demonstrated in the millwork, artwork that recall historical events, the use of abstract patterns based from regional agriculture, and a colour palette that draws from the region. The construction of the airport also employed natively sourced materials and employed local craftsmen to work on the project, creating a consistent design language throughout the space (Thomas-Emberson 2007, 58-64). Consequently, the airport construction has benefited the local economy greatly while creating a place and space that generates and recalls memories and a sense of place for those who were involved in the project, as well as for those who will have the

opportunity to experience the airport. Drawing from the fundamentals of creating identity by Cresswell and combining that with Augé's definition of place as well as the idea of Tuan's 'topophilia', the design of the Dane County Regional Airport takes into consideration sustainability, location, and history of the region to transform the site into space where place-making can occur and memories are relived and recreated.

While the typical airport, among many other buildings, is designed and constructed simply to satisfy practical needs and is even modified to address other needs such as amenities and services that promote the airport as a tourist destination, thus ignoring human needs, functional rhythms, and expectations. In the case of the Dane County Regional Airport, design and planning for creating a sense of place ensures that the needs and requirements of travellers are met. The topics discussed previously investigate space and place, memory, and experience through spaces; however, the matter of the length of time it takes to for the establishment of place must be addressed first.

Ecology of Aging

Older adults are the fastest growing segment of the population in the use of e-mail. By 2010 there will be 2.5 times as many adults over the age of 65 who use computers as there are today. This growth comes from two areas: an increase in the total number of people in the older adult category and in greater use of computers by older individuals...these trends highlight the desire and ability of older persons to embrace technology.

-Andrew Pickering (Pickering 2004, 6)

Imagine the Smyths: an elderly couple travelling for the first time since they were teenagers. The Smyths have recently retired from their jobs and they finally have the time and financial capability to travel. As such, this opportunity will finally allow them to fulfill a lifelong dream. However, with their age, mobility limitations has afflicted them and Mrs. Smyth has recently been troubled with declining vision problems. They are comfortable with their home environment and daily rituals. The emotions that the Smyths are experiencing are mixed. Not only are they excited for the adventures that they will experience but they are also anxious about air travel. They are aware of the news about the current political climate and are uncertain about what to expect about security protocols at the airport despite what family and friends have shared. At the airport, their journey upon arrival and through to the departure gate is overwhelming. Not only is the space confusing, but the Smyths have difficulty navigating the airport and because of that, they nearly miss their flight.

How can space be designed so that it is accessible to all ages, especially the aging generation? The theories of the ecology of the aging with relation to the environment was first established by American M. Powell Lawton and his colleagues during the 1970s. The idea was centered around the hypothesis that the “more competent the person, the less dependent they are on environmental circumstances” (Peace, Holland and Kellaher 2011, 734). There are arguments that the adaptive behaviour of people is compromised by attachments and prolonged exposure to the status quo of the surrounding environment. There is continual debate regarding the turning point of age where individual independence becomes at risk. Since the introduction of this

theory, there have been a wide range of responses trying to identify with creating a sense of self through manipulation of the environment, structural support, and relocation (Peace, Holland and Kellaheer 2011, 734). There are many factors that affect adaptive behaviour at both the macro and micro level. At the micro level is the issue of personal and family history. Feelings of attachment can affect psychological awareness displayed through emotions of loss, safety and security, all of which can affect personal morale levels. At the macro level is the attachment with community. The ability for individuals to find support with community will affect the level of environmental interaction and engagement. This relates directly to the individuals capacity to adapt and the delicate balance between their comfort zone and the challenge zone (Peace, Holland and Kellaheer 2011, 736-737).

The Environment and the Body

There are several developmental stages identified in Lawton's study of the correlation between the individual and the environment. The environmental docility hypothesis is where the competence of the individual is compared to the amount that the surrounding environment affects an individual. This then evolves into the press-competence model that examines individual competence with specific environments using comfort and performance potential as indicators. Competence, according to Lawton relates to the "biological health, sensation and perception, motor behaviour, and cognition" of an individual (Lawton 1983, 350). While gerontology was developed for the interest of understanding the association between the elderly and their community or familiar home environments, theorists and researchers have expanded this to include all everyday experiences at the micro and macro level. In a study carried out by Sheila Peace, Caroline Holland, and Leonie Kellaheer, the elderly in several different locations and housing facilities were surveyed to determine factors that influenced their decision making process. Some resulting key concepts that emerged from their investigation include:

1. Temporal perspectives on self in the environment
2. Spatial perspectives on self and environment
3. Layers of environment and boundaries between them
4. Normative expectations of 'home' and 'neighbourhood'

5. Complexity and agency in environmental adaptation

(Peace, Holland and Kellaheer 2011, 740)

In addition to these concepts, it appears that behavioural interaction with the environment is highly dependent on culture and ethnicity, and personal experience as well as familiarity with space and place. The degree of environmental satisfaction that is experienced in a space depends on the amount of influence from interaction with friends, engaging in activities, and psychological well-being. These factors contribute to Lawton's definition of a good life, as shown in Figure 2. The figure depicts the behavioural responses elderly individuals associate with their milieu are responsive to their level of happiness - determined by factors such as sociability, denial, and self-esteem. Each sector represents components of the 'good life' and how a subtle change in one sector would cause instability in the other sectors.

While there have been many different authors who have written and researched about the ecology of aging, it seems that there are several similar fundamentals that arise about the self, as described by gerontologists and anthropologists like Herzog and Markus, Kaufman, and Brandstädter and Greve:

1. The self is defined and made in a cultural space
2. The concept of continuity and permanence
3. Biographical meaningfulness
4. The creation of a narrative with the self

(Rubinstein and De Medeiros 2003, 61)

The four key concepts listed above investigate the association between the elderly and their surrounding community or with familiar environments. Surrounding spaces have the capabilities to influence the body physically and emotionally. This allows the body to connect and create memories within the space both consciously and subconsciously. Continuity and permanence relates with the creation of personal identity based on "stability and stabilization of self-referential beliefs" (Brandstädter and Greve 1994). It relies on individual autobiographic memories to build meaningful connections. Personal life history, appearances, beliefs,

motives, and attitudes are some characteristics that influence biographical meaningfulness. Our life experiences and approaches to challenges define our competence with the aging self in the future. Methods in which we conduct ourselves translate to our interpretation and ability to connect to our surrounding environment. The interior design elements within these environments can create a narrative that is unique to each individual, building on the notion of memory and experience within a space.

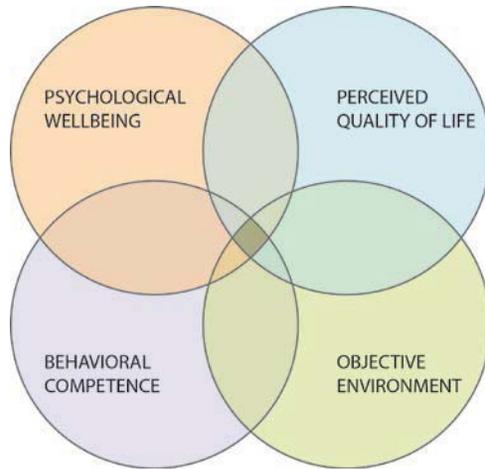


Figure 2. M. Powell Lawton - Four Sectors of the Good Life

Travel for the Elderly

All these fundamentals are factors that affect the reasons for travel of the elderly population. Zachary Zimmer, Russell E. Brayley, and Mark S. Searle tried to determine the factors that affect travel in the aging population in a study conducted in 1995. Other research, such as a study by the American Association of Retired Persons (AARP) clearly demonstrates that senior travellers have more capital to spend than their younger counterparts. The questions of whether or not to travel and where to travel are influenced by many factors. From several studies held in the United States, it can be concluded that the primary reason that seniors travel is for rest and relaxation. Other incentives for travel consist of exposure to new experiences, social interaction,

nostalgia, physical exercise, and escaping the stress of everyday life (Zimmer, Brayley and Searle 1995, 3). However, concerns that dealt with issues of security, finance, lack of time and information, and health are important factors in travel constraints.

With respect to the residents of Manitoba, the study by Zimmer, Brayley, and Searle sampled 1,406 adults who were 65 years and older and living throughout the province - half resided in Winnipeg and the other half sampled were in eight surrounding communities. Conclusions drawn from the study show that seniors tend to "report a relatively high level of self-assessed health status despite experiencing a number of chronic conditions and mobility restrictions" (Zimmer, Brayley and Searle 1995, 4). In addition, the study found several other factors that contributed to Manitobans' ability to travel. These included income, education, rural versus urban residence, willingness to spend, and health conditions. In addition, there has been an exponential growth of the aging population, and this trend will continue well into 2050, when, according to the United Nations that estimates that every sixth person will be over 65 years old (Boksberger and Laesser 2008, 311). This reflects the demographic in Canada because not only is the senior population the fastest growing but it accounts for 80% of luxury travel and who are willing to spend 74% more than the rest of population for a typical vacation (from seniorlivingmag.com). In addition, seniors alone contribute to over \$35 billion in expenditures in Canada. This trend is possible because modern medicine helps members of society to live longer and be healthier than ever before. Thus, it is important for design to accommodate this population.

For seniors, the level of comfort in an interior is based upon well lit, easy to navigate, and safe surroundings. Equally important is the need to feel respected by others, claims Jeff Hartman and Hailan Qu in an article on the travel market for seniors (Hartman and Qu 2007, 77). In essence, all these feelings affect experience and memory. Memories draw upon novel experiences from earlier times and are integrated into a person's lifetime. This is referred to as a reminiscence bump where "...unique memories act as anchoring events..." and are "...highly influential to an individual's development over time..." (Tung and Ritchie 2011, 333). Reminiscence bumps are characterized by the development of life goals and identity. They rely on past experiences and memories to synthesize a meaningful sense of self through personal goals, ideals, and wishes. Many researchers argue that the reminiscence bump is a period that is critical "for the development of identity and the emergence of life story schema..."

(Cappeliez 2008, 25-26). This concept could explain the reason for the increase of airplane travel by the elderly. It is possible that they have a need to fulfill childhood and adolescent desires and dreams. This theory transfers into interior design as a crucial factor in creating a memorable space. Furthermore, studies show that reminiscence bumps are triggered by positive experiences that aid memory retrieval that inadvertently affects decision-making processes, the establishment of identity, and relationship development. Recalling a positive experience like the first time travelling away from home or visiting a museum, for example, can help moderate emotions and improve the state of mind by creating a connection between past memories and the present. Designers need to continue exploring how design can improve mobility, cognitive attention and recollection, as well as memory support that could lead to higher levels of function and the adaptive capacity of an interior space.

In order to integrate memory and experience to the interior of an airport, the space must have few constraints on mobility and support a positive experience to encourage travel in the future. Wayfinding and spatial understanding are both key contributors to the psychological experience of an interior space. Spaces that allow travellers to pause and encourage decision-making are areas of transition that can accommodate the flow of movement and navigation. Wayfinding and mobility are vital for reinforcing feelings of comfort. According to Steve Thomas-Emberson, signage can cause unintended confusion, adding to the layer of confusion for travellers. In general, signs for navigation, destination, including service and retail signage are everywhere and are “devoid of clarity, hierarchy, and even logical information...” (Thomas-Emberson 2007, 54). There have been many cases in airports where the assumption is made that travellers will understand the mere use of signage. In such environments where stress levels are above normal, it is crucial the information is available immediately and more importantly, comprehensible. The human mind is supposed to be able to handle up to 6 colours and 12 different font sizes on anything up to 6 boards at any given time (Thomas-Emberson 2007, 54). What might seem like an overwhelming amount of information for the human mind to process might be considered irrational. Wayfinding and signage at the airport needs to send a clear and concise message to the traveller as a part of the journey throughout. Signs that are unclear and confusing merely magnify stress levels. In several existing airports that apply signage successfully, designers understood the logical problem solving and perception of information breakdown of the human mind and created a hierarchy according to levels of importance for information. All signs, including

signage for retail, directional, and restaurants, all displayed attentiveness to detail. It seems then, that the use of signage should be limited if possible and the design elements of colour and texture should complement each other and together, enhance the environment to create a positive experience for wayfinding. Another design consideration that aids wayfinding and navigation throughout a space is geometry. It creates functional patterns and flows in the path of travel to establish spatial order. This constructs a sense of cohesiveness throughout the space by creating natural flows and pauses that are logical to understand and promotes spatial awareness. In addition, taking into consideration the increase in aging travellers, airports should provide generous amounts of space for circulation and baggage including baggage carts and other mobility and support devices, signage that takes into account visual acuity, and seating along areas to accommodate pauses. It is exceedingly important to address the continual increase in the usage of airport spaces generated by the steady growth of the aging community.

Designing of the Marco Polo International Airport in Venice, Italy have done extensive research on developing wayfinding methods and signage that will put travellers at ease. The information system is based on a hierarchical system depending on level of importance for travellers. It is integrated seamlessly into airport interior including retail and food and beverage facilities. According to design consultants, JHP Design, a less is more principle was applied so that “some elements in the signage become almost subliminal for the passengers in the terminal” (Thomas-Emberson 2007, 55-56). Directional signage utilizes a box-like structure that emphasizes clarity through varying box size, colour, and choice of typeface. In addition, thought and study have helped determine the placement height and location of these signs to ensure a clutter-free field of vision. Retail shops stand apart from the rest of the airport through branding these shops as individual units much like a shopping centre rather than an airport brand. As put by Steve Collis: *“You are on a journey at an airport so the signage has to be clear and take you on that journey through the airport. It must not be intrusive but be as clear as possible: that way it benefits everybody”* (Thomas-Emberson 2007, 56). The thought process and design consideration demonstrated in this project echoes the principles of environmental adaptation and the creation of an atmosphere that exhibits comfort through ease to navigation.

Perception of Security and Surveillance

With the forecasted increase of seniors travelling, the issues of security and comfort arise in this particular setting. The ability for seniors to feel comfortable in a space relates indirectly to their ability to live longer and more independently. This source of freedom allows them to have full control over decision-making processes along with providing an increased quality of life. The latter is made possible by the use of technology. Referred to as 'gerotechnology', this concept relates to the increasing amount of technological devices available to seniors to allow them increased independence. However, this requires the ability to accept technology. The following list are positive indicators of technological acceptance (Mahmood, et al. 2008, 108):

1. Education
2. Age
3. Gender
4. Location of residence

Most researchers claim that the apparent benefits of technology, as briefly discussed, have greatly improved our quality of life. For the 'x' and 'y' generation, the advantages of technology are transparent. However, for those in earlier generations, technology that accommodates decreasing vision, hearing, attention, and memory is a predominant need (Charness and Schaie 2003, 100-108). It appears that when technology is broken down to be simple and easy to comprehend, it can benefit the elderly members of society, reinforce feelings of independence from the familiar to the unfamiliar. Furthermore, the use of technology can prevent a sense of helplessness and vulnerability that indirectly leads to a decreased quality of life. Technology has also become integral in many homes, particularly for seniors who have begun to embrace it as a method of boosting self-confidence, social interaction and a sense of security.

Considering the impact of technology on the lives of seniors, how can it expand from the home to create a sense of security outside the home environment? In addition, how do seniors perceive security and surveillance and what is the role of technology in this sense? Providing an answer for these queries involves the investigation of how baby boomers and the silent

generation perceive technology and the extent of its use in their everyday lives. Baby Boomers, in a joint study by AARP and Microsoft are the largest consumer group showing the most interest when it comes to purchasing electronics. This group is also influenced by technological wants of younger generations. Boomers show interest in learning new technologies and willingly share knowledge among their peers. One common theme from the study was the need for uncomplicated directions and ease of use with the desire that technology would adapt to address their needs directly. However, technology must fit their lives and values they hold dear (Rogers 2009, 5). Boomers are using technology in all aspects of their everyday lives, from its support role for hobbies like music and writing to making travel arrangements that will allow them to “live a fuller life” (Rogers 2009, 24). The silent generation is slower to adopt using technology than the Baby Boomer generation. In a survey published by Linkage Technology, 41% of persons aged 65 to 100 owned a personal computer, 61% owned a cellular phone, while only 33% had access to the Internet (Lewis 2012). Another major factor with seniors is their unwillingness to spend extra money on technology, regardless of income (Lewis 2012). However, if the cost for technology is low then seniors are willing to adopt its use. As stated by Scott Collins, “it will be critical for technology manufacturers to involve the older consumer as early as possible in the development of new technology” (Lewis 2012). Although there are distinctive differences between the technological needs of Baby Boomers and the Silent generation, it is apparent that there is a growing interest in the integration of technology in their everyday lives. Designing specifically for technological usage in the aging generation will encourage the adoption of technology into all aspects of life, branching out from the personal home environment to public spaces. Advances in technology have improved function in people’s lives. Devices and technology that have shaped the world, like the smart phone, global positioning systems (GPS), personal music players, high speed Internet, online services, and social networking benefit all aspects of society at a personal level. The application of these technologies has also been applied to public areas to improve customer service, increase operational efficiency, and to monitor human activity. While technological advances have increased our perception of our surrounding environment, it has also paved the way for increased integration of security in all aspects of our daily lives. Such places that have seen such changes include shopping malls, corporate buildings, medical facilities, correctional facilities, and airports.

While there has been much debate about how increased security is related to stress, Pickering suggests that "heightened security is a very obvious way to put them [travellers] more at their ease" (Pickering 2004, 7). From this perspective, this means that security is necessary to create a reassuring safe atmosphere for all travellers, especially seniors. For this group, establishing a sense of personal safety is particularly important. In a survey conducted by Dagleish and Myhill (2004), perceptions of safety and security were accomplished through an increased frequency and number of foot patrols (Burnett 2006, 134). In several other publications, it has been demonstrated that seniors feel that close circuit television (CCTV) is an effective response to preventing crime and anti-social behaviour. In many environments the installation of monitoring devices is encouraged to add a sense of security. It is important to note that these conclusions are based on studies of community spaces but they can be adapted to reflect possibilities for other environments. No specific literature pertaining to the perception of safety and security in airports has been identified. There have been, however, considerable amounts of literature available on the use of technology, surveillance systems, and security in the lives of the aging generation in both healthcare-related concerns and community living. For the purpose of this project, key aspects of how the elderly perceive and understand surveillance and technology will be drawn into the design of airport spaces. Along with this expected rise in population are increased desires to travel and fulfill lifelong dreams that were not possible before. This is a clear indication that there is an urgent need for research relating to the elderly and their perception of security and surveillance systems and how these systems effect emotions, safety, and comfort in mass public areas.

Integrating memory and experience to the interior of an airport, the space within needs to assess and resolve the problems of mobility to enforce a positive experience to encourage travel. The issue of security and comfort in the airport needs to ensure that seniors feel comfortable. Technological devices are increasingly available for seniors. They are slowly beginning to embrace it as a means of improved confidence, community, and security. Several design considerations that can inform this project include:

- Ensure a flow between all aspects of the keypoints and transitional elements
- Ample daylight where possible while minimizing the use of artificial lighting
- Open views at any point during the path of travel

- Change in interior finishes, textures, and pattern to delineate zones
- Entertainment and retail zones to break up the distance of travel, allowing for pauses in the flow

Contemporary airport design is not limited to current projects, but should also embrace past projects that have pushed design during its time. The Trans World Airline (TWA) terminal in New York designed and built between 1956 and 1962 by Eero Saarinen was conceptualized from the study of passenger movement and the objective “to design a building in which the architecture itself would express the drama and specialness and excitement of travel” (Román 2003, 46). The interior volume of the airport was seen as spatial relationships between form and volume. Saarinen drew inspiration from other transportation hubs and romanticized the idea of air travel demonstrated through the use of large spacious volumes that evoked feelings of weightlessness. In addition, the TWA terminal was one of the first buildings to use a model building process to help understand the form, explore possible weaknesses and strengths in the design, and to help solve structural problems. This process has influenced designers like Frank Gehry to implement modelling in their design process (Román 2003, 53). The Madrid Barajas International Airport is a modern contemporary building designed by architects Richard Rogers Partnership. Its contemporary approach through colour and playfulness “celebrates the excitement of travel” (Rogers Stirk Harbour + Partners 2012). The blend of aesthetics and technology create an exciting interior space that is flexible for change and stimulates the senses. For this reason, the airport is the recipient of seven awards including the AIA/UK Excellence in Design Award in 2006 and the Airport Council International Award for Best European Airport in 2008. Through its linear structure, the Barajas Airport not only allows the airport to slowly expand as required over time but also uses passenger movement to create an animated façade at the parking area, visible to those in the terminal area. Aside from environmental concerns, it is apparent that passenger circulation from the departure concourse and arrivals hall to awaiting modes of transportation was given priority. In addition, visual cues that help create a sense of place and aids wayfinding include the undulating roof structure, alternating areas of light and dark, and inclusion of open and closed structure. These elements incorporated in the design are intended to create a space that is intuitive to travellers and thus transforms the space into place through a memorable experience. Although the Barajas Airport and TWA are new buildings, the aesthetics, in particular the attention to detail, use of colour and material, and generous application (or

consideration) of daylight in the interior are several design elements that should be implemented in the design of the old Winnipeg Airport. Investigating the Canadian market, the Vancouver International Airport is an excellent example of an airport that creates a memorable experience through its vast collection of visual award-winning art and architecture. The artwork and interior architecture present travellers with a journey of land, ocean, and sky that represent cultural heritage and the province of British Columbia. Vancouver International Airport was awarded the 2012 National Urban Design Award for the theme of a “Sea Island landscape” (Architecture Canada 2012) that has contributed to the creation of place identity, sustainability, traveller experience, and the overall brand of the Vancouver International airport. The gesture created greets visitors and residents alike to strengthen the bond between the body and place making through the celebration of art throughout the terminals that appears to serve several purposes:

1. To represent and support the region and culture
2. Act as a landmark to provide a sense of orientation within the space
3. To celebrate artists and their work, as well as to promote appreciation for the fine arts and craftsmanship

As a major transfer hub, Vancouver International is place of arrivals, departures, and transfer. The flow of passengers from check-in to departure and from arrivals to exit must be coordinated and effortless. Passengers should have a sense of directional awareness; they should know where they are within the terminal at any given time. As said by Andrew Cohen, “airline passengers get their first and last impressions of a community at the airport. The most memorable gateways are often those that capture the spirit of the place” (Pickering 2004, 34-35). Keeping this perspective in mind then, the Vancouver International Airport is a successful example, that manifests these qualities. The gestures created by the airport put travellers at ease. By doing so, it also generates a feeling of being in a secure place, elevating the airport terminal to a friendly and welcoming place where a journey is enjoyable. These elements of design demonstrate consideration for passenger comfort and experience while maintaining functionality, sustainability, and security.

Airport and Stress: What are the causes of stress in the airport experience?

With the new worries about terrorist activities, being in an airport can be an uncomfortable experience even for seasoned travelers. But then, airports have always been worrying places for many passengers, particularly those who travel by air infrequently – or perhaps have never done so before.

-Andrew Pickering (Pickering 2004, 6)

The airport environment is constantly changing to adapt due to the nature of the economy. There are many issues and concerns associated with air travel - from finding parking to the path to the check-in counter and from there, the security checkpoint and the departure gate all provide sufficient opportunities for errors to occur. To alleviate this stress, it is important to design an interior that is clear and open with routes to guide travellers throughout the space without a need for excessive signage. There are many airport terminal designs that showcase strategies for reducing stress in such environments for the benefit of all persons. Several design considerations include:

- To ensure a flow between all aspects of the keypoints and transitional elements
- Providing ample daylight where possible while minimizing the use of artificial lighting
- The inclusion of open views at any point during the path of travel
- Apply changes in interior finishes, textures, and patterns to delineate zones
- Use entertainment and retail zones to break up the distance of travel, allowing for pauses in the flow
- To create a sense of place through the local geographic location

Understanding the anxieties associated with air travel and incorporating a design solution that addresses these needs will help put travellers at ease. Several design aspects to be considered to reduce stress and insecurity can be categorized into four main categories:

1. Accessibility
2. Diversity
3. Sociability
4. Comfort

Designing with the four categories above in mind is necessary to create successful public spaces for the aging. The ability to connect spaces and places together ensures that all users are able to access spaces easily and that they are free from discomfort. Planning for a diverse set of activities, entertainment and retail establishments will ease the passage of time during wait times and possible flight delays. Equally important is the provision of spaces that provoke social contact. This accommodation creates a sense of place by balancing the needs of well-being through feeling safe and secure with the need for stimulation through exploration and mental mastery of the environment, according to Michael Balint (Rowles, Oswald and Hunter 2003). This balance allows for relationships to develop between the traveller and the space around them. As many travellers also travel in groups, it is important to provide ample space to give a sense of privacy for social interaction. In addition, reducing stress levels can create an enjoyable environment. It is apparent then, factors that affect the airport experience and can affect comfort include aesthetics, sustainability, and cleanliness.

The airport is not a static environment, it is continually changing and must constantly adapt but these changes should not lead to the loss of character for the building. Any loss in character would take away from the experience of the building and the journey of discovery. It could directly affect the passenger experience in relation to comfort levels, ability to adapt to new spaces, and alter the intended design language of the space.

Facilities that are prone to change are listed in this chart (Edwards 2005, 87):

Changes per 3-5 years	Changes per 10-15 years	Changes per 30-50 years
<ul style="list-style-type: none">• check-in counters• surveillance systems• signage and wayfinding system• retail and restaurants• departure gate ticket counters	<ul style="list-style-type: none">• baggage handling systems• building HVAC system• water closets and kitchen	<ul style="list-style-type: none">• building structure• building envelope• vertical circulation – stairs, elevators, escalators

Table 3. Changes in Airport Facilities



Airport Design: What are the Key Elements for a Successful Design?

The research of airports in this practicum has led to a thorough investigation of modern airport terminals that were designed and built after 2001. During this process, I compiled a list of similarities that I believe were essential to the success of the airport, measured by positive feedback from travellers in addition to the awards bestowed to the designs. The following is a list that identifies the key design elements and emerging trends in airport design:

- Column-free interior
- Colour and materials help define zones and ultimately, aid with navigation
- Clear sight lines and obstacle-free path of travel
- Ample natural and artificial daylight
- Inclusion of areas that provide privacy and opportunities to rest
- Interior landscape, graphics, and art work can be used to represent geographical location
- Signage is not the only means for expressing wayfinding

It is increasingly evident that the theories of place making are at the forefront of airport design, in conjunction with concerns of sustainability. Particularly in airport design, ideas of place making must be in harmony with surveillance and security to ensure that all public spaces are optimized for comfort, communication, and creating a caring environment. At the same time, these spaces need to provide an aura of comfort that accommodates flows and pauses and navigation through the space. The way in which people interact with space directly affects their emotional and physical character. Understanding the importance of this, many modern airport designers are using typographic elements, colour, texture, plants, art, and aesthetically pleasing forms to excite the senses and inspire the mind and body.

Summary

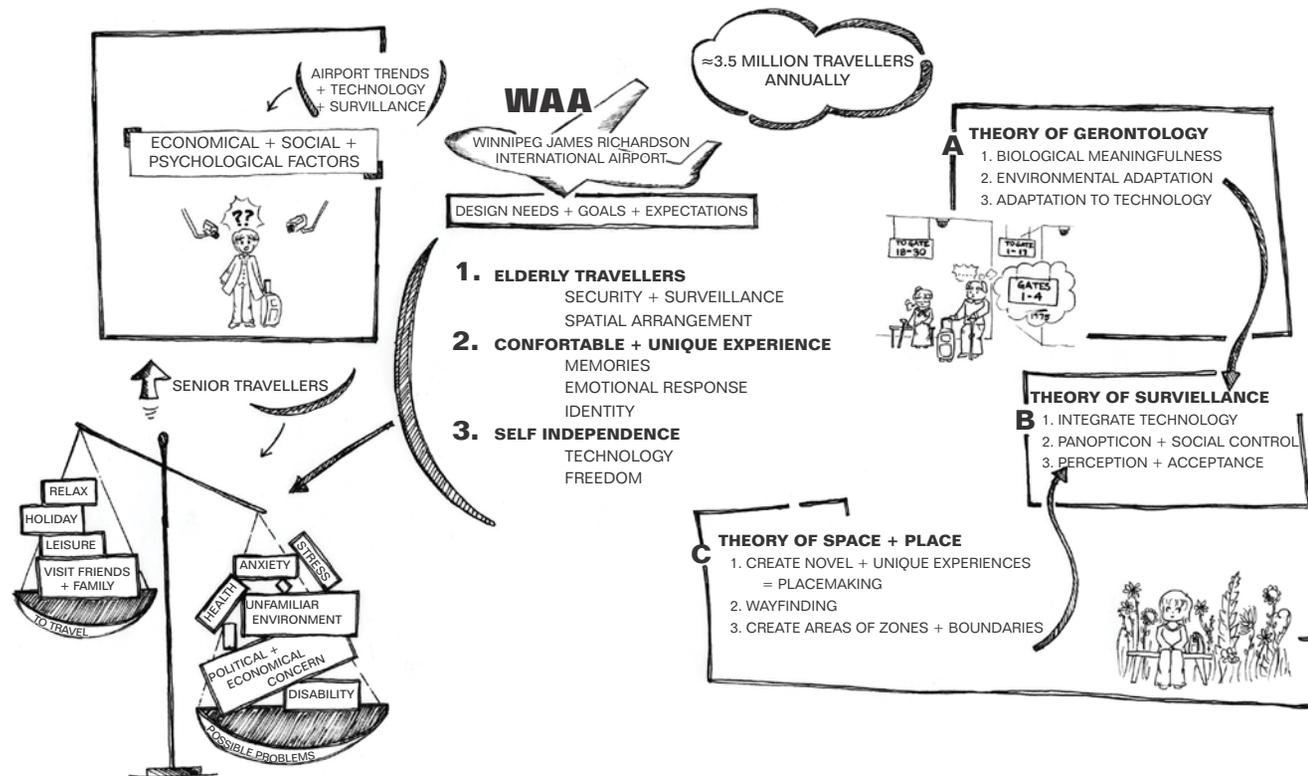


Figure 3. Theory Diagram, Illustrated

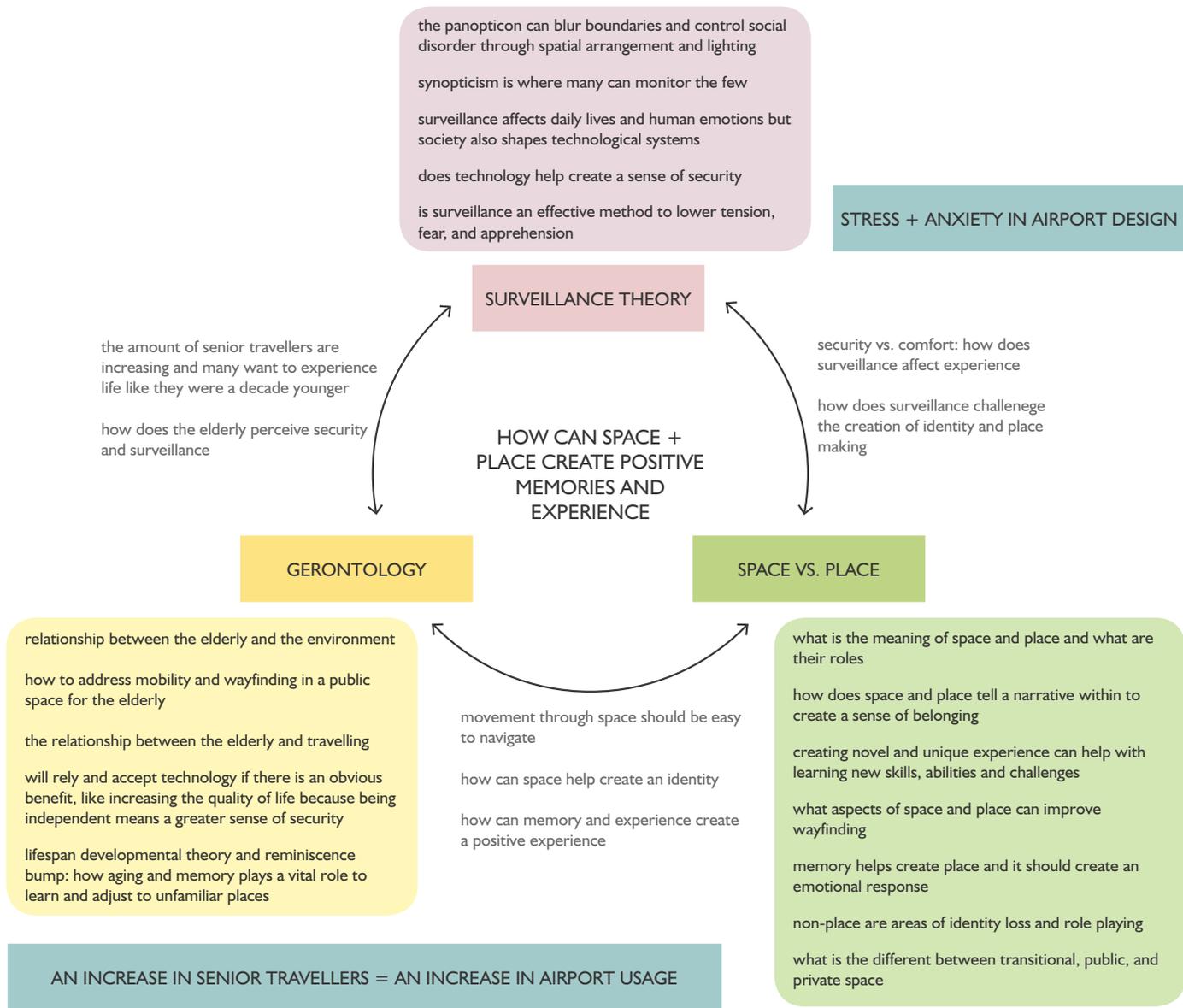


Figure 4. Theory Diagram

Introduction

The following five projects have been selected as precedents to study and to guide my understanding of public transfer places, and supportive spaces that enable learning through journey. Each of these projects examines a different purpose related to airports through spatial arrangements and demographic considerations.

The Beijing International Airport was built to accommodate the XXIX Olympiad in 2008. It takes into consideration sustainability, passenger experience, and operational efficiency. It is the second largest building in the world presently and is the most technologically-advanced for its typology.

Precedent: Terminal 3, Beijing Capital International Airport



Figure 5. Beijing Capital International Airport

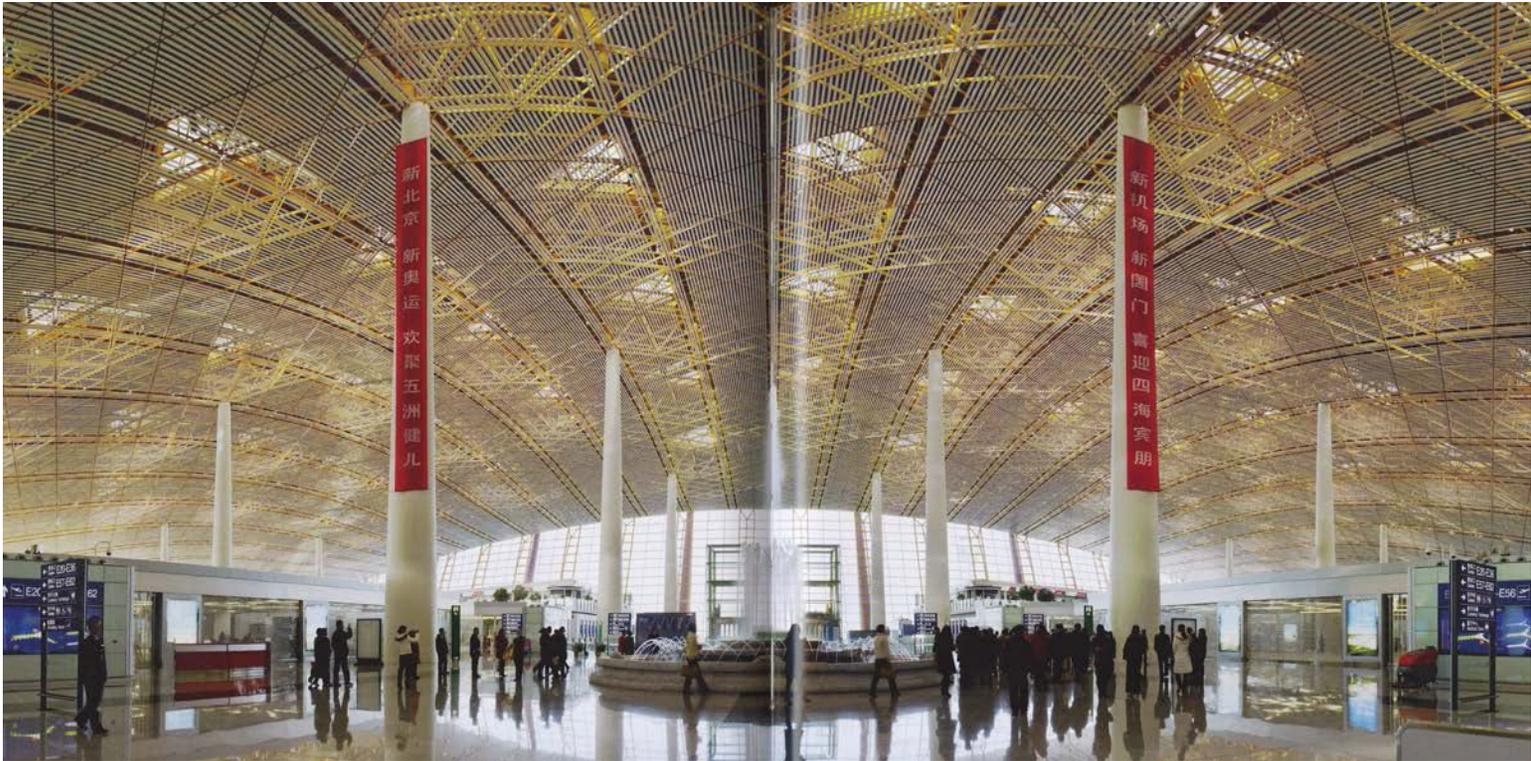


Figure 6. Interior: Beijing Capital International Airport

Architect/Designers: Foster + Partners, NACO (Netherlands Airport Consultants, and ARUP)
Lighting Architects: Speirs and Major Associates
Area: 1,300,000 m²
Location: Beijing, China
Cost: \$1.71 billion US
Date of Construction: Construction started April 6, 2004
Fully operational February 29, 2008

The third terminal at the Beijing Capital International Airport was an expansion to accommodate international travellers and also to serve as the welcoming gateway for visitors during the 2008 Beijing Olympics. It was built as a response to the fast growth in air passengers due to China's economic boom. Terminal Three expanded on the design principles of London's Stansted Airport, which were further developed at Chek Lap Kok Airport in Hong Kong. The design for Terminal Three was approached from a perspective that investigated the complexities of modern air travel, operational efficiency, passenger comfort and experience while keeping in mind sustainability. The resulting design has created a new standard for airports and has since been published in architectural journals like *Architectural Review* and *A+U: Architecture and Urbanism*.

The speed and dedication of the all project members saw the completion of the airport from initial design to construction in about four years. Social and technological factors were primary concerns that drove the design and planning phase. Combining the requirement for space to change with efficient service standards, fully integrated transportation services, minimize walking distances and changes in levels, and planning for minimal transfer times; Beijing International Airport has set a new standard in airport design.

With the new terminal and runway, the capacity of the Beijing Capital International airport increased from 35 to 80 million passengers per annum. By 2020, it is estimated that it will serve 50 million passengers annually, making it the busiest airport in the world (Abel and Foster 2010, 8). Designed and developed with flexibility to adapt to changes in the aviation industry, Beijing's airport "marks the latest phase in the evolution of a quintessentially modern building type" (Slessor 2008, 22). Moreover, the design development stage to the completion of construction only took four years. This demonstrates the efficiency and dedication of all individuals on a large-scale project that is "17 percent larger than all of London's Heathrow terminals combined (including the new T5) and nearly twice as big as Hong Kong's Chek Lap Kok" (Slessor 2008, 22). The resulting concept has a considerably smaller footprint as a result of a linear design combined with a tall ceiling height even though the building is large.

Foster's programming for Terminal Three romanticizes air travel, similar to the connotations associated with air travel when it was first commercialized in the 1920s. Inspiration drawn from the first airports called for simple and straightforward designs. Investigations of successful railway designs from earlier years provided an understanding of passenger flow and movement. In addition, the requirement for the new terminal included a "unifying plan form and umbrella roof, clarity of organization - especially the flows of passenger movement from landside to airside and vice versa - and visibility of the aircraft at all times, minimal changes of level, abundant natural light, mechanical services contained within the podium or undercroft (rather than within the roof), and integrated ground transport systems" (Abel and Foster 2010, 15). Understanding the needs of the airport authorities, the requirements of aircrafts and most importantly - taking into consideration the human aspect, Terminal Three exemplifies excellence in responding to a technology-infused cultural society that is "at once both place and non-place" (Slessor 2008, 23). The airport as a non-place is distinguished by the technologies that create spaces that move people through the terminal efficiently. The overwhelming use of technology overpowers the senses, from automated walkways, to the fully integrated rail system, the surveillance factor could be seen as a means to usher the traveller from their arrival to their destination. On the other hand, the airport is a place where vast open space is bathed in daylight accentuated by the traditional Chinese colour palette and brings emphasis to the ceiling grid and the skylights above. The seemingly endless interior excites the visual journey, providing ample views throughout. While this stimulates the senses, it also acts as an orienting device that allow travellers to connect physically and emotionally with the space around them as they traverse through it. The symmetrical master plan creates a harmonious language with the surrounding landscape while producing an aesthetically appealing view from the sky. Using an innovative design strategy of inserting all mechanical systems into a podium allows the roof structure to be clutter free, to keep the weather out and to let daylight in.

The interior space of Terminal Three is expansive with massive ceiling heights and glazing. Daylight enters the interior and creates a sense of spaciousness, optically enlarging the interior. In addition, emphasis on the tapering of supporting columns mimics building methods of the Ancient Greeks that created the illusion of taller heights. There are apparent design considerations derived through experience and research conducted to guide the arrangement of space and circulation patterns.

The aesthetics of the airport terminal, according to Foster + Partners, used traditional Chinese culture to create a symbol of place through its aerodynamic roof that resembles a “dragon-like form [celebrating] the thrill and poetry of flight. Its gold roof resonates with the Forbidden City while the striking interior palette of red through orange to yellow evokes traditional Chinese colors” (Arc Space 2009). The art of circulation and wayfinding appears to rely on openness and clear sight lines.

Despite the success of integrating technology into the design of Terminal Three, it seems that there is a disconnect between the space and the signage. When the space is empty, it is easy to see the signage, but when the terminal is occupied, the signage becomes lost and navigating the airport from the check-in to the security control becomes an unpleasant ordeal. From the layout, it is apparent that circulation paths are based on a linear system that funnels passengers from the main entrance to the departure gates. Through the access to natural light and colour along with the aesthetics, the designers tried to create a rhythmic language throughout the space. The gates for arriving and departing have taken into consideration the theory of experience as written by Yi-Fu Tuan. The gesture of welcoming passengers arriving at the airport was an integral part of the design process, taking precedence over the departure area. Unlike typical airport designs, however, Beijing International greets international passengers with a view of the immense roof and open spaces throughout, engaging them both visually and emotionally from the moment they disembark. The mechanical-free roof, ample glazing, careful use of colour, and unobstructed views to the exterior create a sense of weightlessness and transparency that take into consideration the comfort, well being, needs, and requirements of the passengers and client. Although the design goals of Foster + Partners strive to benefit all users, user satisfaction is necessary as a tool for continual learning and adaptation in the improvement of interior design. Feedback from travellers varies depending on the amount of time spent waiting at the airport. While the majority of travellers felt the airport was clean, many expressed displeasure at the limited amount of shops available, the uncomfortable cold temperature inside, as well as the long distances between services, retail, and departure gates (Skytrax 2011). This indicates that while Beijing Capital International Airport is successful in many ways, there are areas that travellers’ needs are not being addressed.

Precedent: Arnhem Central Station, Transfer Hall



Figure 7. Masterplan: Arnhem Central Station



Figure 8. Transfer Station Interior: Arnhem Central Station

Architect/Designers:	UN Studio	Location:	Arnhem, The Netherlands
Engineers:	Arup Associates	Estimated Cost:	€ 625 million (approx. \$823 million US)
Gross Floor Area:	Transfer hall	6,000 m ²	Date of Construction:
	Underground parking	44,000 m ²	
	Bus terminal	7,500 m ²	
	Office towers	22,000 m ²	Construction started 2006 Phase I completed July 2, 2011

The introduction of the high-speed train links in Arnhem, the Netherlands, brought a need to redevelop its station areas to accommodate this change. The initial station areas were a mixture of public transport hubs that accommodated trains, buses, trolley buses and taxis. This station acted as a welcoming gate to all visitors to the town, as more than half of the visitors who use the station are from outside Arnhem. The proposed project includes an integrated transportation area, a high-rise tower, an underground parking facility, and a large roof canopy, that spans most of the site. Being the ninth busiest station in the Netherlands, with more than 65,000 visitors passing through the station center daily, it was vital to create a high quality space as it was the main entrance into the town as well as a connecting hub to other areas within the town. UNStudio architects designed the new station along with the engineering company Arup. The Ministry of Housing, Planning and Environment, the Ministry of Water and Traffic management, and the City of Arnhem commissioned it because they believed that restructuring the existing station for the expansion of the high-speed rail system would provide economic opportunities for the town and the surrounding regions (Walraven and Stelhorst 2008, 1129).

The design concept behind Arnhem Central Station was to create a central point where train, taxis, bus, cycle, trolleys were easily accessible to all. Combining an office tower into the master plan grounded the rail station as the town center with surrounding public spaces that allowed for cafés and restaurants. One of the key design considerations to be addressed was the need for a sense of space that can be easily navigated without having to rely on wayfinding methods. Through design and structural innovations, the transfer hall is a space free from columns, allowing pedestrians to use intuition to navigate the space. The freedom from columns provide travellers clear sight lines so they know exactly where they are in the space, it prevents confusion and the possibility of information hidden from view. In addition, it makes the space universally accessible. According to the ADA, public spaces need to ensure the requirements of barrier-free design are maintained. Keeping a space free of columns will not only help those who have physical, sensory, and cognitive disabilities but it will also aid cognitive mapping, according to behavioral geographer Reginald Golledge, which is an individual's "internal spatial representation of points, lines, areas, and surfaces that are learned, experienced, and recorded in quantitative and qualitative forms serving to spatially orient the

wayfinder” (Salmi n.d.). In addition, such cognitive maps orient the traveller by determining a path of travel that can be applied to other similar environments.

In addition, the design fully incorporates the transfer hall with the bike park, underground parking, offices, commerce, a public square, railway platform and tracks, an underpass and a car tunnel leading to the town into a fully integrated master plan made possible through the use of V-walls and the naturally sloping urban landscape. UNStudio utilized the natural landscape of the site and integrated it with the proposed transportation systems that allowed them to be brought together in the same building but on two different levels. The design objective at Arnhem sought to create a cohesive urban landscape that could accommodate passenger flow with minimal obstruction. The resulting design is a cumulation of studies of space, time, movement, structure and form that addresses the relationships between program and distance, movement, and interaction at different times of day. Through the use of extensive computer modelling and an integrated design process, the result is a specially engineered structural design that utilizes freeform concrete, gentle slopes and ramps on a small footprint, allowing for a column free structure. The decision for building two levels at Arnhem Central is based on study of passenger movement at New York’s Grand Central Station and the Klein Bottle Model. The Klein bottle explores space as four-dimensional where the surface moves from inside to outside without any boundaries or edges (Polthier 2003). Arnhem Central transposes this model by creating a new typology for the terminal that continually transitions seamlessly from the inside to the outside. This new typology addresses the terminal as a city where areas of transition that occur in contemporary life becomes the focus to create a new urban landscape.

Through this, the conceptual form of the building responds to the natural folds of the site both externally and internally. Maximizing the continually changing ceiling heights and sight lines of the landscape allowed the central hall to "become a "collector" of people, natural light, ventilation, circulation zones...through its folding plates" (Walraven and Stelhorst 2008, 1130). Examining the design of Arnhem, it is apparent that accommodating the traveller was a high priority of the designers. With the structure spanning 8700 m², its undulating steel, aluminum, and cold-formed glass roof forms a central meeting space where people, retail, commercial offices, and various modes of transportation blend seamlessly in the urban environment. Realizing that

wayfinding through such a complex space is integral to the design's success; carefully planned lighting and custom free-form concrete shapes and millwork, and uses of vibrant colours were designed to help guide travellers through the space intuitively. In addition, overhead signage will provide wayfinding cues. According to ARUP, extensive research was undertaken to understand human behaviour and the result is a column-free space designed around the people who will use it. All modes of transportation accommodated - train, bus, car, and bicycle, were carefully coordinated to ensure that passenger transfer is simple, comfortable, and efficient. Furthermore, to create a sense of openness and direction, the penetration of natural daylight and location of mechanical systems underground increases the available space for passengers and businesses.

This project was awarded the Schreuder Prize in 2005 for its innovative and unique design and construction using free-form concrete. The Schreuder Prize is a biannual award in the Netherlands presented to celebrate excellence in the field of underground construction. The designers employed an integrated design process to successfully bring this project into reality. The complex, organic structure was made possible through the reliance on technology and advanced programs such as custom-built geometrical software, computational form-finding, fabric modelling, and three-dimensional printing. As a result, the new station occupies a relatively small footprint of about 40,000 m² where the station itself is about 160,000 m² of usable area. Large solar controlled transparent windows and skylights create an impression of spaciousness in the interior while keeping the climate in the terminal manageable. Circulation paths are kept clear of obstruction by locating services around the edges, marking boundaries through changes in material, and implementing automatic lifts to ensure that all areas are accessible. With this new station and master plan, Arnhem Central will be able to accommodate over 110,000 transfers daily. The overall design of the station will reflect "architectural expression to human behaviour in a unique and enlightening way" (Arup 2011).

Precedent: Oakbridge Retirement Village: The Lodge

Architect/Designers:	DLA Interiors, DLA Architecture
Location:	Buckshaw Village, Chorley, Lancashire, United Kingdom
Building Capacity:	64 single rooms
Estimated Cost:	£26 million (approx. \$41.3 million US)
Date of Construction:	Construction completed Autumn 2008

The Lodge was built as a residential and nursing home designed for dementia care at the Oakbridge Retirement Village. It was developed and run as a joint venture by Buckshaw Village and HICA group to accommodate 64 residents for long and short term stay. The Lodge is the first establishment of its type in Britain to be awarded the “Gold Design” by the Dementia Services Development Center (DSDC) at the University of Stirling. In addition, the community as a whole at Buckshaw Village was the winner of the Pinders Healthcare Design Award in 2009 for its layout and concept. It received the EAC Housing for Older People Award in 2010.

The concept behind the Lodge was to create an environment that allowed residents to feel like they are home rather than living in an institution. The accommodation provides a high quality housing environment that is well designed for both patients and caregivers with supporting amenities located in a central area called the “Market Square”. This area contains a bakery, a cinema, a café, a hair and beauty salon, and a pet store in a setting that is safe for those diagnosed with dementia and other related memory impairments.

In an article documenting interviews of several caregivers at the Lodge by researchers at the Open University in the United Kingdom, the unique triangular shape of the building is described as allowing entry to the building with maximum daylight

penetration that is made possible through windows that run to the floor with an open garden in the center. Design considerations included the use of natural daylight and wide corridors, making it dementia friendly for navigation and spatial awareness. The importance of material and colour selection provides clarity for dementia persons in wayfinding. Solid colours as opposed to patterns, and discretely blending changes in finish materials are integral to the design. Using an open space plan while creating distinct areas for various activities encourages and reinforces a sense of community and belonging while making it easier for caregivers to supervise their charges. The concept of the open plan is made possible with the triangular shape of the building and eight foot wide corridor that provides access through the building, allowing people to see exactly where they are going. In comparison to other typical care facilities that are designed with closed spaces that give a sense of oppressiveness, this innovative approach to designing for dementia care using open space gives a sense of freedom to patients by encouraging them to wander around. This approach has improved challenging behaviours associated with dementia such as agitation, screaming, restlessness, anxiety, depression, and hallucinations. The challenges to creating an open plan included choosing colour schemes and finishes that would be understood by patients. Material selection for the flooring and wall had to blend seamlessly from space to space where rooms that were accessible to patients had to stand out and staff and maintenance rooms had to match the wall. In addition, the careful implementation of artificial and natural light creates the illusion that the space is larger and reinforces the feeling of freedom.

It is reasonable to understand that maintaining minimal changes of material and colour is integral, colour contrasts also help to create visual cues that define places like apartment door locations and washrooms. Furthermore, the placement of windows for views to the outside provides ever-changing scenery that also helps individuals keep track of time and the season. The use of technology has also helped residents through the use of automatic en suite lights when residents enter and exit their beds as well as equipment that records the amount of time patients receive care from staff members, allowing staff to work out the best care plan (Working with Older People 2009, 9).

Another equally important element in the design is the open community garden that promotes a sense of wellness, independence, and community. With an open door policy ensuring full access to the gardens, its user-friendly layout stimulates the senses and encourages social interaction and active participation among all residents. Along the paths, resting points provide relaxation areas and allow residents to observe the surrounding environment. Establishing the feeling of place and belonging as explored through Yi-Fu Tuan's theories create relationships that are formed between people and place. The importance of constructing a space that appears spacious can excite the senses and form a personal bond as a result. The Lodge adapts and interprets such theories to impress on the importance of belonging, which is evident through the design process and in addition, supports Lawton's study of the relationship between environment and people. It is these seemingly simple solutions that encourage independence among individuals that provides them with memories of feeling at home.

Precedent: The Mirabella at South Waterfront

Architect/Designers:	Ankrom Moisan Associated Architects
Location:	Portland, Oregon
Building Capacity:	30 storey, 224 unit tower
Estimated Cost:	\$225.3 million US
Date of Construction:	Construction started Spring 2008 Construction completed 2010

A new urban development was proposed in Portland, Oregon in the South Waterfront District. This area needed to include the aging population as a part of a vibrant community. Ankrom Mosian Associated Architects proposed a continuing care retirement community called “The Mirabella” to address this need with a facility that provides all levels of senior care from independent living apartments or assisted living where the surrounding environment is readily accessible to amenities. The key objectives identified are as follows:

1. To develop a state-of-the-art urban continuing care retirement community (CCRC) as part of a vibrant, developing urban waterfront community
2. To extend CCRC services to seniors who desire an urban-environment lifestyle
3. To join with the highly regarded Oregon Health Services University to provide the latest in technological resources and applications for an aging population

(The American Institute of Architects 2008, 154)

Designing a building for an aging community requires a space that is beneficial for both the residents and employees. The Mirabella is a certified LEED Platinum building. Its designers based their design decisions on sustainability that included choosing a site that is was formerly contaminated, and using strategies such as solar hot water, green roof to control storm water runoff,

native plants, and locally sourced materials. Typically, building sustainably following LEED guidelines have been limited to hospice care, long term care, and retirement communities; residences for the aging population are beginning to follow their footsteps and embrace the requirements for LEED. Their approach to CCRC advocates support for the continuing care retirement housing community by allowing seniors to continue to live an active lifestyle without having to surrender friendship, learning, and a healthy lifestyle. While the thirty storey tower limits horizontal circulation with only eight units per floor, all services, facilities, and activities are easily accessible to all residents. The eco roof, practice of water efficiency, material selection, and indoor air quality help maintain a healthy lifestyle for both the building and its occupants. Daylight plays an equally important factor in the design that is made possible through the shape and size of the tower allowing for the optimum arrangement of units for daylight penetration and views to the outside. Zoning requirements imposed restrictions on the building design that were successfully overcome. Designers created a building and space that are integrated with their dense surrounding neighbourhood that is open to people of all ages.

It is noteworthy to indicate the rapid growth of these retirement communities, providing the aging population with a viable alternative lifestyle to that in the broader community. The challenge with retirement communities, according to Bevan Grant, is creating a "...sense of identity, belonging, freedom and independence" (Grant 2006, 101). The issue that is constantly being explored is designing and planning a place that allows the aging generation to sustain their routines and habitual patterns through the selection of community and type of housing. Important determining factors include designing for "a safe and secure place that positively affects the lifestyle, behaviour and consumption practices of the residents" (Grant 2006, 105). While the aging generation will continue to grow, there is a need to address the already aging population and also the future generations to come. Presently, there are limited precedents that focus on designing to accommodate the aging generation. Instead focus has primarily been on hospice or long-term care facilities. There is a growing need to consider those who desire a community that provides health care but allows them to maintain their independence. As such, society needs to adapt to the population trends and promote designing everyday objects, buildings, and interiors that support all age groups. This will ensure that all persons, especially the elderly, will continue to partake in society with ease and comfort, reinforcing their sense of belonging, community,

and independence. Aging communities are beginning to accommodate these needs but other environments should be discreetly designed for the needs of the aging while also benefitting the rest of the population. There are, however, several spaces that have been planned and designed to be accessible for all ages. Although these spaces are community parks and gardens, they are nonetheless enjoyed by all members of the public. One outstanding example is the North Shore Riverfront Park in Pittsburgh.

Precedent: North Shore Waterfront Park

Architect/Designers:	EDAW Inc. (now AECON)
Total Acreage:	11.25 acres
Location:	Pittsburgh, Philadelphia
Estimated Cost:	\$35 million US
Date of Construction:	Completed in 2001

The North Shore Waterfront Park spans from the north bank of the Allegheny River to the Ohio River across from downtown Pittsburgh. Plans to revitalize the waterfront occurred as the Heinz Football stadium and PNC Park baseball stadium neared completion. With these two stadiums are oriented towards the river to allow boat and bike access, it was in the interest of the City of Pittsburgh to develop greenways that attract residents and visitors alike to the waterfront. The resulting design is a two level space looking towards downtown Pittsburgh consisting of a several unique features including a riverwalk, riverwall, and a large expanse of greenery. The riverwalk and riverwall on the first level provide a connection between the landscape and river's edge, providing users with paths eighteen feet wide to accommodate recreational activities such as running, cycling, rollerblading, etc. while also providing tie-ups for boats, kayaks and canoes. The second level consists of approximately three acres of grass, native landscaping and paths that mimic the flow of the river, providing an ideal space for leisure activities, festivals, and casual athletics. The walkway that runs at the top of the park is a mixed-use space that spans between sixteen to forty feet in width and links together a variety of light recreational activities, outdoor restaurants, retail spaces, corporate headquarters, and entertainment venues. In addition, the interactive fountain and Market Street pier are popular gathering places for families and the elderly.

The planning and site of the park was well executed with its universally designed connection to the central business district and adjacent neighbourhoods made possible through pedestrian bridges that are bicycle- and handicap-friendly. The ease of access to all members of the public, and well kept maintenance continues to serve the community with a comforting and relaxing yet secure environment. The successfulness of this greenway has proven that a former manufacturing city can reclaim its waterways to promote health, wellness, and education. The North Shore Waterfront Park in Pittsburgh exemplifies the ideas and theories of Yi-Fu Tuan through the creation of a sense of place by means of memory and emotional attachment, connecting history, people, and place to generate a sense of community. The master plan for North Shore Waterfront Park defines itself on creating unique connections between the site, the surrounding environment, proposed future developments, and the city through the use of landscaping, public art, and an architectural style that echoes the historical character of Pittsburgh through materials, colour palette, detailing, and scale. These considerations establish a cohesive language between all the elements in the space; it places the importance of creating a relaxing and enjoyable atmosphere between people and place. The waterfront also draws on the fundamentals defined by Herzog and Markus, as well as Brandstädter and Greve on the self when space and environment affects the body, creating a narrative and psychological connections that influence perceived quality of life. Connecting the waterfront with the proposed developments, the river, the riverfront park, and trail systems unifies the site into a place that is reminiscent of the history of Pittsburgh and encourages community gathering, local events, and also a popular destination to view the cityscape.

Summary

The wide-ranging examples presented in this chapter all place emphasis on the importance of creating an experience that has the potential to excite the senses and engage people with the environment. In addition, most of the precedents exemplify the importance of wayfinding, and its role in reinforcing comfort and reducing stress in places where time is essential and anxiety levels range from moderate to high. The integration of these aspects with regard to the interior environment will help people forge a sense of place and foster authentic relationships with place. While the Beijing Capital International Airport and Arnhem Central Station examine how places of transience can evolve into positive experiences, Oakbridge, Mirabella, and North Shore Waterfront are places that invite the potential for community interaction and active living through a narrative that excites the

senses, builds on memories and emotional attachments. Through the investigative process of these precedents, the following guidelines were formed to highlight successful elements that should be considered in the design of the airport:

- Openness and penetration of daylight into the interior improves sightlines, wayfinding, and can reduce anxiety and confusion.
- Pleasant views to the outside and the connection to nature through touch, feel, and smell engages all the senses that foster relationships between the self, the world, and those around them.
- Design areas that support individuals and interaction between people through form, material, and colour.
- The choice in material, colour, and graphics should excite the senses while creating visual cues that break up space intuitively while providing an atmosphere that project comfort and security.
- The integration of interior landscape to help with creating flows and pauses, orientation, to construct relationships, and bring elements of biophilia into the interior.
- Use of artificial lighting and climate control should maintain environmental comfort throughout the space and adapt to pedestrian traffic throughout the course of the day.
- Material and detailing should capture the spirit of the City of Winnipeg – its history, culture and evolution into the 21st century and translate it into a narrative that recall past memories and form new ones.
- Design wide paths of circulation with ample areas to rest and pause to accommodate passenger flows, accessibility, and visual cues.

Introduction

The old Winnipeg James Richardson International Airport was located at 2000 Wellington Avenue. It was only seven kilometers from the airport to downtown Winnipeg, providing access to businesses and visitors alike. In addition, it was the only major international airport between Toronto and Calgary. Built in 1965 in the International Style, it was a modern 400,000 square foot steel and glass structure that had exquisite detailing. It was home to about 160 employees who operate out of five facilities that keep the airport operational: the Administration Building, Air Terminal Building, Powerhouse, Field Electrical Centre and the Combined Services Building. The airport was home to nineteen airlines. Some of these airlines include Air Canada, Air Transat, Delta Airlines, United Airlines, West Jet, Bearskin Airlines, Calm Air, and First Air. In addition, the airport facilitates all types of air cargo from companies like FedEx and Purolator. The airport was the eighth busiest airport in Canada in terms of passenger traffic and in 2011, it served 3.4 million passengers. However, demolition of the old Winnipeg James Richardson International Airport took place in 2012.

This project aims to use the interior space of the old Winnipeg International Airport and to propose a hypothetical design of it to suit the needs of a growing city, taking into account the emerging and potential future trends in airport design that could affect the journey of experience. The interior of the old Winnipeg International Airport will be hypothetically transformed into a open concept where many of the existing interior walls, structural components and vertical circulation will be demolished to create an

interior that will allow light to penetrate from all sides. The focus of the design will concentrate on public areas that travellers will occupy from curb to the security checkpoint and after the security checkpoint to the gate. The goals for the project are as follows:

- Create a terminal that facilitates growth, movement, and place making
- Welcome visitors and residents alike to a place that reflects the spirit of Winnipeg
- Integrate landscape and natural materials into the interior to foster connections between travellers, place, and time
- Introduce openness and light into the interior, allowing travellers to develop connection with themselves and the space they are temporarily within
- Place equal emphasis on the arrivals level as the departures level

Contextual Issues

The old Winnipeg International Airport currently does not fulfill the needs of a growing city nor does it satisfy the current political, economical, and demographic trends of Winnipeg. In addition, it is necessary for the airport to demonstrate its ability to predict and adapt to future trends. The region and location of the airport plays a role in determining the size of the airport and the scope of work required to adapt to the growing needs and requirements of the airport. Revisiting the Dane County Regional Airport in Madison, Wisconsin, USA, the moderately-sized airport redefined itself as a place through the approach of creating a sense of place. Local materials, native plants, and local architecture were implemented to introduce travellers to their destination. Elements of sustainability, graphic design, and finish detailing were integrated into all aspects of the design for the existing and new airport terminals to accommodate the increasing travellers and air traffic demands. The contextual strategy for redesigning the old Winnipeg International Airport will be modelled after another airport, the Victoria International Airport in Victoria, British Columbia, a busy hub that serves Vancouver Island. Although moderate in size, plans to transform the airport over a twenty-year period that began in 2005 will comprise a new airside system that can accommodate the projected air traffic growth. This ranges from the construction of a new terminal, runways and aprons, support facilities such as roads, parking lots, a maintenance building, and a control tower, all of which will conform to a uniform design concept. Uniqueness is another element that makes the airport memorable. For example, trees are integrated into the airport interior and there is a bicycle path along the perimeter of the airport grounds. At the same time, needs for sustainability, efficiency, friendliness, and comfort are addressed, making Victoria International Airport one of the most popular airports in the world according to a poll by CNNgo (Rane 2011).

As discussed in Chapter 1, there is a gradual change in travelling demographics. According to Statistics Canada, it is apparent that the aging generations are finding reasons to travel more often and subsequently there are more seniors travelling than ever before. At the same time, the requirements for an airport have changed dramatically within the last decade. These changes have been made possible due to advances in research and development in the technological sector. With the design shift focusing on issues such as sustainability and LEED, human factors are defining how spaces should benefit all users. In the modern airports of

the twenty-first century, the terminals are becoming places to stimulate human senses; they have the capability of supporting commercial and city life. Airports are becoming mega-structures that redefine the building typology into the likes of a city. As exhibited in large international airports across the globe, “the twenty-first century looks set to take on the characteristics of traditional urban areas, not just in their functional and human multiplicity, but in the formal language employed” (Edwards 2005, 261). London's Heathrow Airport, the Changi Airport in Singapore, or Sydney's Airport Terminal 1 redevelopment are a few examples of the many airports that celebrate the travelling experience through a dynamic and integrated process while maintaining the characteristics of the modern airport. As such, the circulatory paths and points of interest are comparable to streets, shops, and neighbourhoods. The treatment of the interior space in these airports creates a sense of comfort and familiarity by creating places that are easy to navigate and feel safe. These airports clearly demonstrate the importance of incorporating regional and national motifs within the interior space. Creating a positive exposure to the city where the airport is located reinforces the impression of home for local residents and for foreigners, a taste of what is to come or memories of their travel is provided.

Site Location

City of Winnipeg

Population: 691,800 (2011)

Latitude: 49° 52' 48" N

Longitude: 97° 10' 12" W

Time Zone: UTC -6 hrs.

Warmest Month: July

Coldest Month: January

Average Temperature, Winter: -16.4°C

Average Temperature, Summer: 21.7°C

Winnipeg James Armstrong Richardson International Airport

Address: 2000 Wellington Avenue

Airport IATA Code: YWG

Airport ICAO Code: CYWG

Latitude: 49° 54' 36.13" N

Longitude: 097° 14' 23.59" W

Elevation: 783 ft.

Magnetic Variation: E 3°55.5' (2008-04)

Architectural Style: International

Original Usage: International Airport

Present Usage: Demolished



Figure 9. Site: Winnipeg Airport

Situated away from downtown Winnipeg, the airport is accessible by King Edward Street and Wellington Avenue. It is bordered on the north by Omand's Creek Industrial area, the east by St. James Industrial Area, Assiniboine Golf Club on the south, and Murray Industrial Area from the Southwest. According to the zoning legislation by the City of Winnipeg, the airport is classified as M2 for Manufacturing - General. Due to the unique requirements of the airport that places restrictions on landscaping and

building proximity, the amount of adjacent buildings are limited to the administration building across from the airport terminal building and airport parking lots. Other nearby buildings include the Four Points by Sheraton, the cargo terminal building, airport parkade, and several car rental agencies. Ongoing construction at the site of the Winnipeg International Airport includes The Grand Winnipeg Airport Hotel, located just north of the existing Four Points by Sheraton at King Edward Street and Wellington Avenue. Designed by 5468796 Architecture, the new hotel will be seven levels in height with a total of one hundred suites.

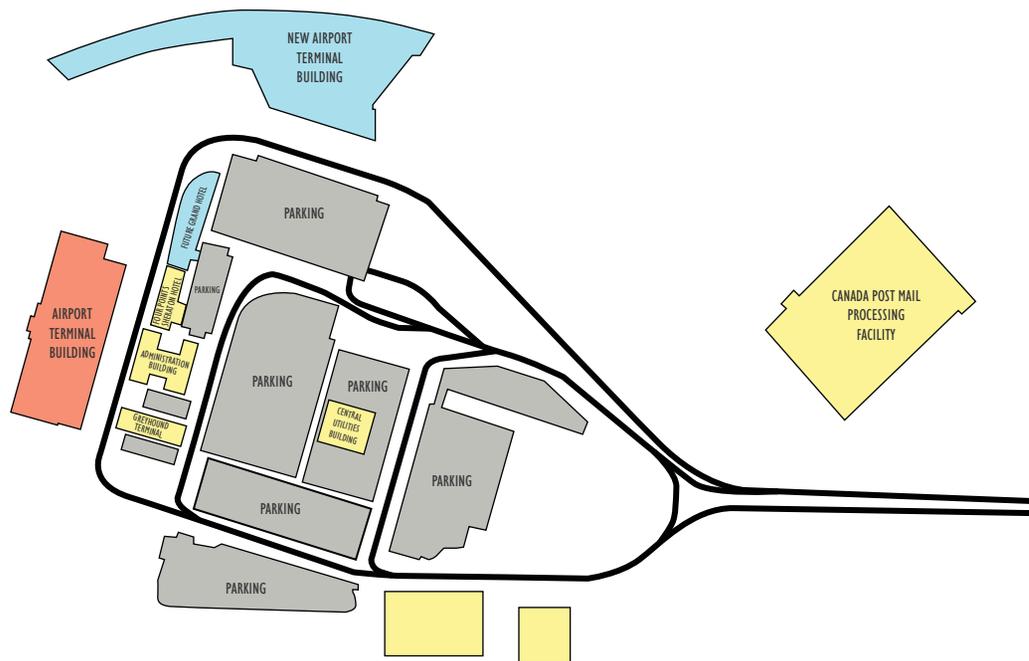


Figure 10. Adjacent Structures

The old Winnipeg Airport is readily accessible by taxi, public transit, and personal vehicles. Driving from downtown Winnipeg to the airport takes ten minutes on average. In addition, Winnipeg Transit System operates two bus routes that travel to the airport through downtown - route 15 Sargent-Mountain and route 20 Watt-Academy.



Figure 11. Paths of Travel

Direction of wind and wind gusts are important for runways at the airport as this can affect weather-related air traffic delays that are not only an economic loss but they affect the mental and physical health of travelling passengers. In addition, wind has been attributed to causing difficulties and challenges in aircraft landings and take-offs where in some events, crashes have occurred. In such instances, shear winds and cross winds are the contributing factors. Furthermore, in the design of the airport, the direction of the wind will help determine the location of entrances and play a role in the design of the HVAC system.

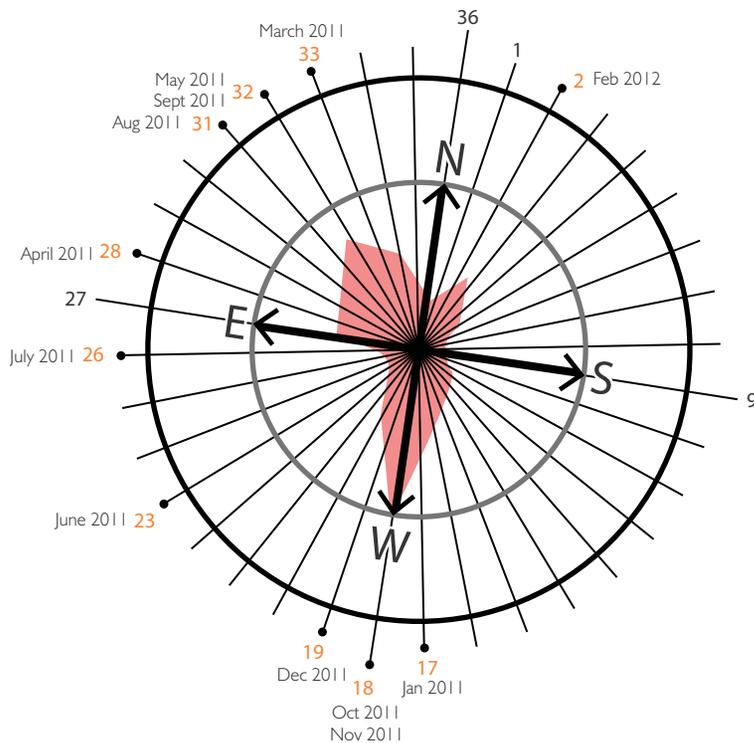


Figure 12. Direction of Maximum Wind Gusts (10's°)

Vegetation and wildlife at the Winnipeg airport needs to be properly maintained at all times to minimize the risk of aircraft and wildlife collisions. Management strategies are required to ensure that all methods utilized are effective. Strategies such as fencing keep large animals from entering the airfield, and noise cannons, screamers, and banger shells are used regularly to discourage birds and other wildlife from crossing flight paths or taking up residence near the airport. Careful maintenance of the grounds surrounding the airport by planting agricultural species such as timothy are effective because they do not provide food for wildlife. Another program in effect at the Winnipeg Airport constantly monitors the growth of the weed Purple Loosestrife. Introduced into North America from Europe because of its attractive purple blooms, the weed takes over the wetlands and is

detrimental to native plants that provide cover and food sources for native wildlife. The authorities at the Winnipeg Airport have measures in place to control the spread of Purple Loosestrife on airport property and adjacent Municipalities.

There are three runways that serve the Winnipeg Airport. Only two of these are operational, however: runway 13/31 (8,700 ft. in length) and runway 18/36 (11,000 ft. in length). The third runway is closed (4,600 ft. in length).

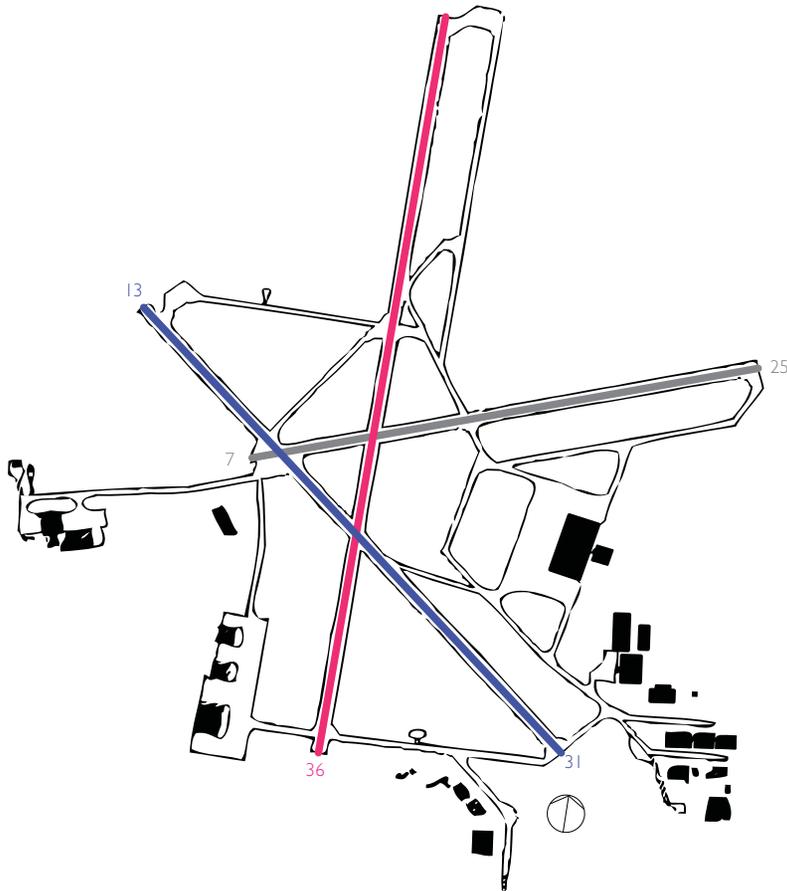


Figure 13. The Runways at YWG

With the closure of the old airport, there had been much debate regarding the fate of the old airport. According to the Heritage Canada Foundation, the old Winnipeg Airport went through the review process by the Federal Heritage Buildings Review Office (FHBRO) as a potential candidate for Federal Heritage Building status (2008). At the other end of the debate was the argument that the airport was not worth saving and should be torn down. Ultimately, a decision called for the demolition of the building. Consequently, the old Winnipeg Airport is currently in the process of being torn down and undergoing preparation for backfill. As a result, access to the building was not possible and proved a limitation for a physical assessment of the site. Due to this obstacle, research, images, memory, and architectural drawings will be the grounds for analysis.

Existing Winnipeg James Richardson International Airport Layout

LEVEL 1

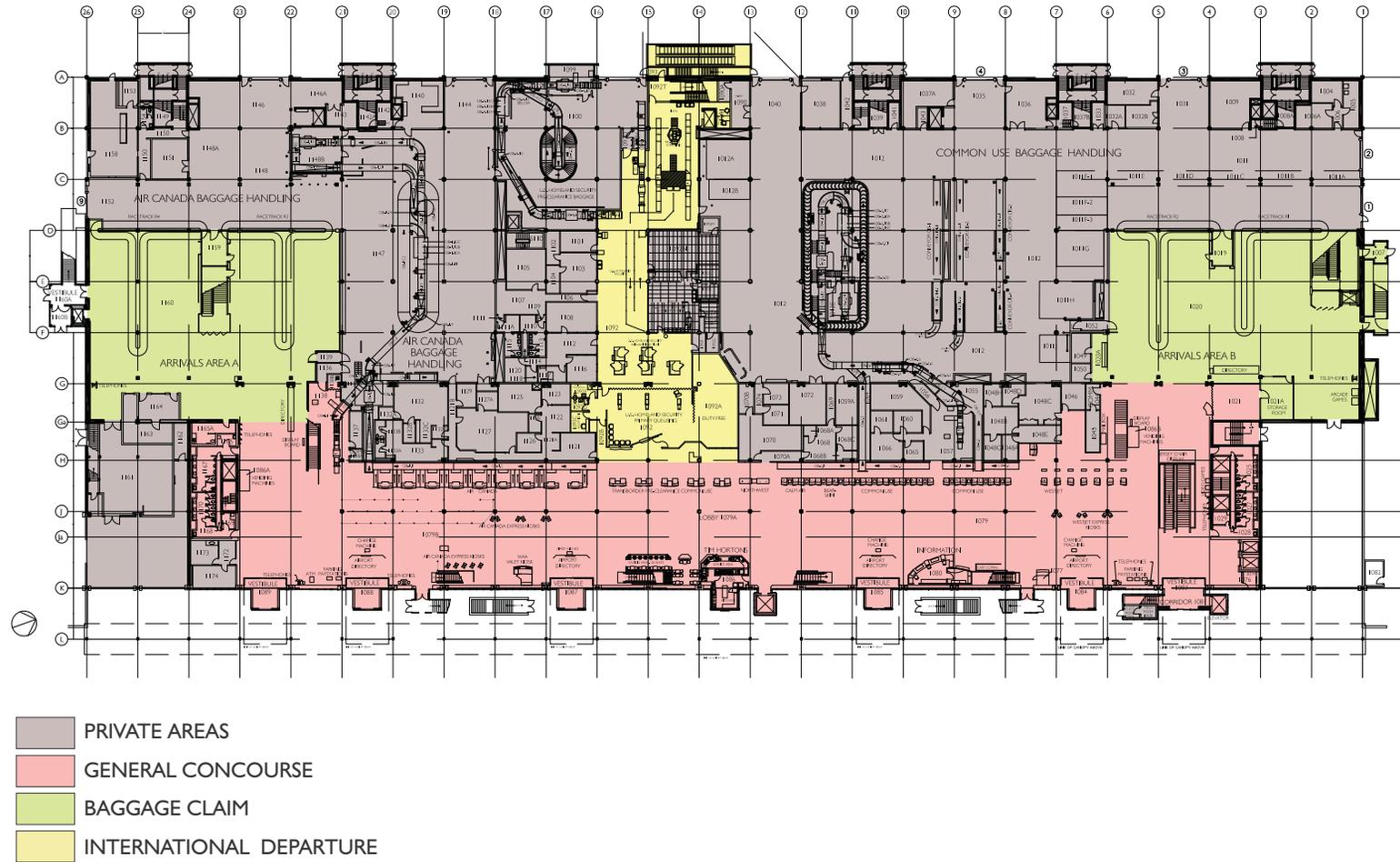


Figure 14. Main Level: Existing Winnipeg International Airport Floorplan

LEVEL 2

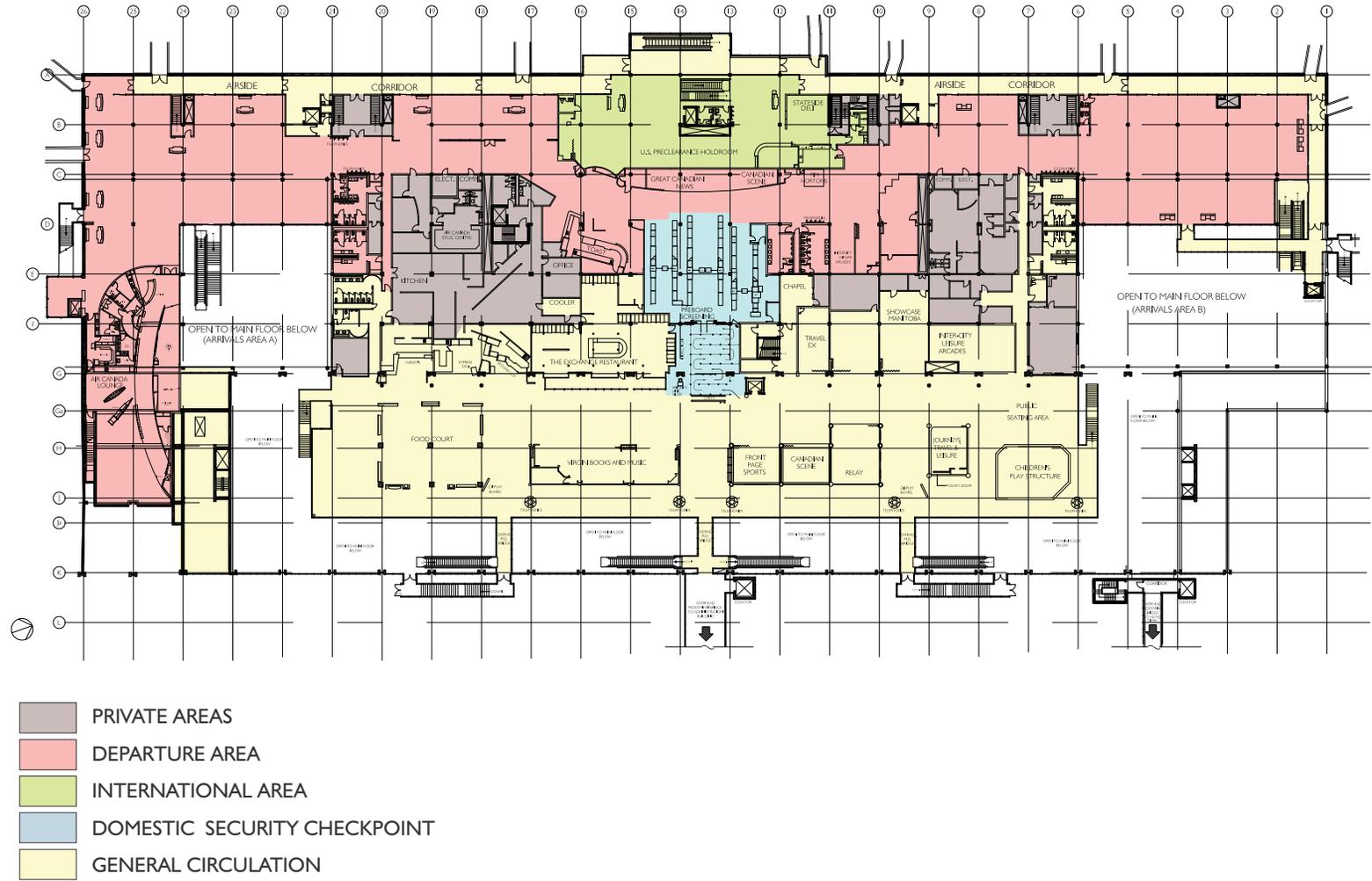


Figure 15. Second Level - Existing Winnipeg International Airport Floorplan

LEVEL 3

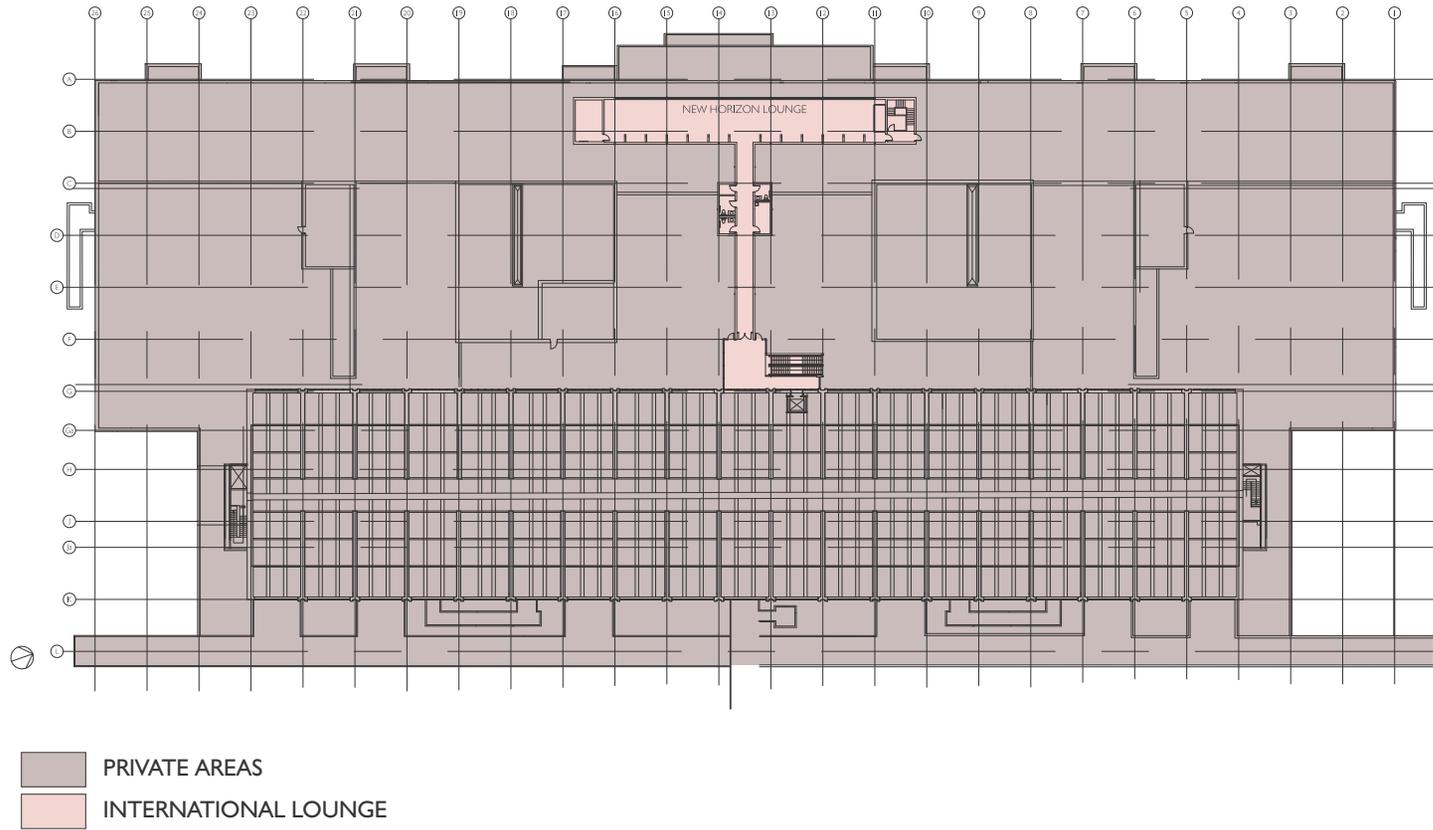


Figure 16. Third Level: Existing Winnipeg International Airport Floorplan

Building Analysis

The Winnipeg airport began as an airfield formed by the Winnipeg Flying Club in the Rural Municipality of St. James on May 28, 1928. The airfield, named Stevenson Field had minimal facilities and consisted of a hangar that accommodated folding winged airplanes and a small cabin. In the next decade, the site began to grow to make way for commercial companies and the Royal Canadian Air Force (RCAF). The ideal location of the airfield led to the expansion that included four civil aviation hangers, an RCAF hangar, and three runways by 1938. It was also during this time that boundary lights, a radio range station, weather reporting facilities, and the first air traffic controller joined the facility. On December 15, 1952, a new passenger facility was added to accommodate airline offices, ticket counters, a baggage conveyor system, a waiting area and boarding points. Stevenson Field continued to experience rapid growth during the mid 1950s and became the fourth largest civil airport in Canada when it added another 800 hectares and a runway to its facility. As the airline industry expanded across North America, newer and larger planes began to utilize Stevenson Field and in 1958, it was officially renamed the Winnipeg International Airport. 1992 saw the establishment of the Winnipeg Airports Authority Inc. (WAA) that set out to "explore the feasibility of community ownership..." for the airport (Winnipeg Airports Authority 2012). Ownership of the airport was transferred from Transport Canada to the WAA on January 1, 1997 and on December 10, 2006 the WAA officially renamed the Winnipeg International Airport the Winnipeg James Armstrong Richardson International Airport in recognition of James Armstrong Richardson's contribution to Canadian aviation history.

The old Winnipeg Airport was designed by the architectural firm Green Blankstein Russell and Associates in 1964. The firm was responsible for the architectural design of several other buildings in Winnipeg, including the Canada Post Building, the Norquay Building, and St. George's Anglican Church. Their work entrenched the firm's reputation of providing a leading edge for modern architecture in Canada. The initial budget for the airport was estimated at \$8.5 million, including the terminal, administration tower, parking, and a power plant as well as necessary water and sewer systems. When the project was complete, the construction cost was about \$16 million. A massive glass and steel structure that was specifically designed for the travelling

culture at the time of construction characterized the purpose built structure. Another defining feature of the Winnipeg Airport was the artwork. The airport partook in a pilot project by the federal government for public art that made Winnipeg one of three cities chosen to test the policy that required half of one percent of the construction cost for new buildings to be allocated for public art. The criteria for the selection of art in the Winnipeg Airport were as follows:

1. The nature of the artwork had to be abstract
2. The majority of the art should be by a Canadian artist not from the province of Manitoba
3. The artist could not be a part of mainstream Canadian art

Based upon the criteria, a total of six pieces of art were commissioned for the old airport. The following is a list of the commissioned artwork:

1. Northern Lights by John Graham (1964) – 12.2m x 45.7m
2. Structural Relief in Fifteen Parts by Eli Bornstein (1962) – 12.2m x 45.7m
3. The Prairie by Alfred Pellán (1963) – 2m x 11m
4. Solar Cone by Gerald Gladstone (1963) – 8.5m tall
5. Totem by Walter Yarwood (1963) – 8.5m tall
6. Memorial for Captain Frederick Stevenson by Anne Kahane (1962) – 2m tall

Of the six pieces of art, only two survived the multiple stages of renovation undertaken at the airport. They were located at the arrivals and departures concourse at the south and north walls. The concept for “Northern Lights” was comprised of aluminum, mosaic tiles, and coloured Plexiglas which, according to Graham, was to capture the sunlight and glow, representing the prairie light and colour and evoking “memories from the early 1960s of distinct fashion styles and product designs” (Flaman 2009, 84). Complementing Graham’s piece on the south wall was Bornstein’s Structural Relief that was also inspired by nature, expressed through a series of coloured enamel, three-dimensional metal cubes. Working in the International Style, the overall goals of the

artworks were “intended to provide visitors with a dramatic first impression of a particular city” and reinforced Canada’s national image. In an attempt to combine the fine arts, modern architecture, and luxurious furnishings, the Winnipeg Airport sought to define a cultural identity for both the province and the country.

The architectural design of the old Winnipeg International Airport drew inspiration from German-American architect, Mies van der Rohe. Mies van der Rohe is considered one of the greatest contributors to the International Style through his radically minimalist designs. The Farnsworth House is a prime example with its steel frame and transparent glazing construction. Mies continually pushed the boundaries of architecture, interior design, and industrial design as he developed the concept of open flexible space. In the 1950s, Mies van der Rohe envisioned the idea of the ability of the convention hall to span large spaces through innovative structural systems. Investigating the International Style, it is apparent that Mies van der Rohe influenced principal architects Bernard Brown and David Thordarson of Green Blankstein Russell and Associates. The rectangular steel framed and glass structure of the old airport recalls the work of Mies van der Rohe and Modernism. The airport exemplified the phrase “less is more” that was also a defining feature of Mies’ work where the colour and texture of materials were the only sources of ornamentation. His architectural interiors had open spaces that challenged the idea of boundaries and at the same time broke up space through abstract rectilinear patterns. For Mies van der Rohe, the indicating factor used to differentiate zones within spaces were characterized by changes in materials. It is apparent that the work of Mies van der Rohe inspired the architectural design of the the original Winnipeg Airport, as seen with its simplistic structure, use of rectilinear forms and sense of balance and symmetry in the interior. In addition, the original furniture used in the lounge of the airport included Mies van der Rohe’s Barcelona chair. The furniture and artwork in the airport not only complemented the interior design but also presented the old Winnipeg International Airport as an example of modernist architecture to the rest of the world.

Since its completion in 1964, the old Winnipeg Airport underwent several transformations, most noticeably when architectural firm IKOY expanded and renovated the building in 1984 and a hotel was built across from the terminal building in 1998.

Human Factors Analysis

Client Profile

In the hypothetical scenario of this project, the old Winnipeg Airport needs to undergo change if it is to adjust to the growing needs and trend of society. This is an issue that must be considered in all aspects of design. In the case of the Winnipeg airport, the Winnipeg Airports Authority would oversee the operations of the airport. The Winnipeg Airports Authority is a “community based, non-share capital corporation” which manages, operates, invests, and maintains the Winnipeg James Armstrong Richardson International Airport (WWA, About Us, 2012). The Winnipeg Airports Authority has been operating since January 1, 1997 when the control of the airport was transferred over from the federal government. The WWA's vision is: “to lead transportation innovation growth” and their mission is: to “provide excellent airport services and facilities in a fiscally prudent manner” with their community (WWA, About Us, 2012). The Winnipeg Airports Authority strives for respect, integrity, and service excellence in all aspects of their operations, to understand customer needs, and implement universal design principles to deliver a safe, comfortable, and secure environment throughout all their facilities. The WWA is continually striving to enhance and expand all aspects of its business and customer operations. As such they have proposed the following strategies (Winnipeg Airports Authority 2012):

1. Enhance customer service and value
2. Deliver and operate excellent facilities and services
3. Be an effective community partner
4. Develop and realize employee potential
5. Develop new revenue streams

Through these strategies, it will be possible for the WWA “to improve Manitoba’s link to the world” and to become a leader in growth and development for the community.

The values and goals of the Winnipeg Airports Authority make it appropriate to hypothetically redesign the Winnipeg airport to fulfill the needs and trends of the aging generation. Incorporating interior design principles in this project will push the Winnipeg airport to be an example in the design of mass public transit spaces for the aging generation.



Figure 17. WAA: Organizational Structure

User Profile

While there are many different types of individuals that pass through the Winnipeg airport, statistics show that there is a steady increase in those who are 65 years old and above who show interest in travelling for pleasure, recreation, or holiday. According to Statistics Canada, the population of individuals 65 years and over is progressively growing and it is projected that growth will continue into at least 2035. Although air travel is one of the safest forms of travel, it may cause psychological and physical discomfort for older travellers. In addition to disability issues like mobility, pain, and vision; there are issues like fear that lead to hyperventilation and anxiety. Other situations that heighten psychological stress include flight delays, going through customs, checking in at the correct location, and finding the correct boarding gate. These stress-inducing activities can intensify in a crowded and noisy environment (Low and Chan 2002, 18). Designing for the needs of the aging should take into consideration the amount of extra time required for navigating and moving throughout a space. Through social support and community, fear in the built environment can be reduced. Design considerations such as lighting for visual comfort, clear sight lines, maintenance, and low walls prevent claustrophobia and reduce the sensation of fear. The aging population, according to Sharon Kaufman tends to draw meaning from past events that, through interpretation and reproduction, create a sense of self in the present. Therefore, designing space for the experience in conjunction with efficient wayfinding and navigation needs to be addressed.

The secondary user group constitutes the travelling businessman or woman who travels similarly as much as the elderly, if not more. These individuals dominate the market of air travel aside from December, July, and August when leisure travel is at the peak. A business traveller is defined as a person who takes more than six business related round trip flights per annum. According to the Canadian Business Traveller Study, the average business traveller spends:

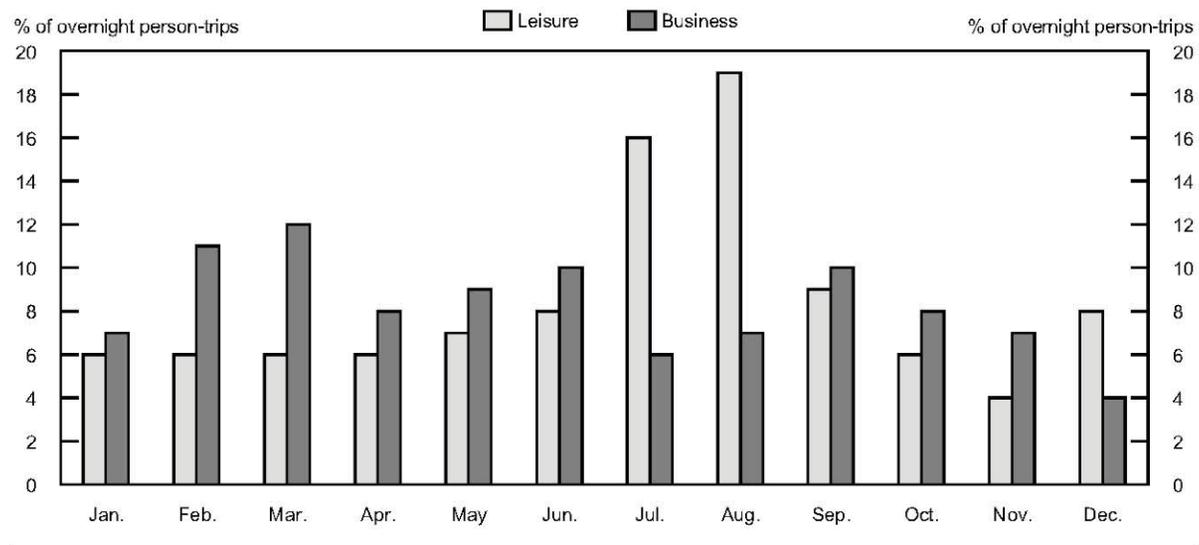
- \$30,000 in total on business travel
- \$9,000 in hotels on business travel
- Over \$5,000 per month on credit cards

(Ipsos Reid 2012)

In addition, this group of travellers are on average between the ages of 35 to 54 and who either hold a degree or post graduate degree from university with a household income in excess of \$50,000 per year. Of business travellers, 56% are males and 44% are females and both genders participate in one or more frequent flyer programs (Frequent Flier 2012). With the amount of travelling this secondary user group undertakes, their exposure to societal trends could influence their attitude and emotions associated with place. This is important because due to the nature of their business and travels, they are most likely to spend the most time in transit or possibly stranded in airports due to layovers, delays, missed connections due to unforeseen circumstances compared to all travellers. As such, it is necessary to ensure that facilities and services provide relief in such events.

Chart 3.3

Seasonal Pattern of Leisure Travel Versus Business Travel, 1996



Source: Canadian Travel Survey, special tabulations, 1996.

Figure 18. Statistics Canada: Canadian Travel Survey

According to the statistics report by the Winnipeg Airports Authority, the table below lists the number of passengers who have enplaned and deplaned at the Winnipeg James Armstrong Richardson International Airport annually.

PASSENGERS (ENPLANED + DEPLANED)

Winnipeg James Armstrong Richardson International Airport

	January	February	March	April	May	June	July	August	September	October	November	December	Total
2011													
Domestic	196,025	190,669	210,311	209,447	33,822	249,116	74,939	282,271	244,750	247,115	213,106	222,268	773,839
Transborder	42,282	42,686	47,101	40,594	34,101	33,402	36,434	36,932	31,489	35,583	37,224	37,240	455,068
International	38,988	38,486	36,924	9,983	-	1,155	1,964	1,745	-	245	8,090	22,750	160,330
Total Passengers	277,295	271,841	294,336	260,024	267,923	283,673	313,337	320,948	276,239	282,943	258,420	282,258	3,389,237
2012													
Domestic	217,472	213,719	224,056	228,688	248,606	262,821	285,263	297,477	249,186				
Transborder	39,461	43,255	46,931	39,423	32,365	32,563	35,396	38,135	32,209				
International	43,806	41,739	39,619	8,572	-	-							
Total Passengers	300,739	298,713	310,606	276,583	280,971	295,384	320,659	335,612	281,395	-	-	-	2,700,662

Table 4. WAA: Passengers Enplaned and Deplaned

Finally, the tertiary users are all individuals who travel rarely. This group only travels when necessary and on average flies only once or twice every couple of years. Each time they pass through the airport, the experience is new and foreign due to continual changes in security protocol, advances in technology, and improved spatial planning in the interior. For these users, it is crucial to create a space that is welcoming and easy to navigate as a means of compensating for the increased stress levels. Providing a positive experience of the journey from curb to gate will create positive memories and potentially motivate these users to fly more frequently.

Functional and Aesthetic Requirements

There are five methods in which the growth in air transportation affects airport infrastructure according to Brian Edwards:

1. more aircraft capacity as number of travellers increase
2. expansion of airspace and traffic control facilities
3. wider and new runways
4. accommodate the need for passenger facilities
5. ease and efficient accessibility to and from the airport

The interior colour and finishes should draw from the geographical area as a reminder of locality. They will play an important role to create a sense of place and space within. The materials selected should also accommodate noise attenuation from aircrafts while daylight and artificial lighting need to complement each other to delineate clear circulation paths for all passengers. Within the terminal building, design considerations need to support the movement of passengers, employees, service and maintenance, and passenger transport vehicles. As such, according to Edwards, the use of turning circles, paths of flow, patterns, and safe distances should be derived from logic and geometry. Simplicity and repeating patterns will ensure a harmonious design language throughout the interior to create a hierarchical system that will also benefit wayfinding. These elements are expressed through structural elements that help define passenger movement and space planning. It is equally important to allow the design layout to adjust and expand to accommodate future growth. Clear delineation of zones and circulation will be defined through the distinct categories of space planning shown below:

MAIN FLOOR: ARRIVALS

ROOM NAME	ACTIVITIES	NEEDS	TECHNOLOGY	EMOTIONAL NEEDS
ENTRANCE + EXIT	passing through	free of obstruction	automated doors	gradual shift from dark to light
ARRIVALS CONCOURSE	waiting	seating	security cameras	natural light comfort security views to outside
CUSTOMS + IMMIGRATION CONTROL	waiting working reading communication	work surface task light task seating computer usage storage privacy	computer security equipment security cameras telephone wireless internet	comfort security natural light connection to nature acoustical control discreet
BAGGAGE RECLAIM	waiting sitting lifting	signage lighting seating standing room	baggage carousel baggage carts security cameras wireless internet	relax security natural light & view acoustical control climate control
INFORMATION/ CUSTOMER SERVICE	working reading communication service telephone calls	work surface task light task seating computer usage storage	computer telephone wireless internet	comfort public views natural light climate control connection to nature
RETAIL/CAFE	rest waiting	tables chairs ample space	wireless internet	comfort relax
MALE W/C	freshen up	sink toilet dryers	automated dispensers	privacy acoustical control climate control
FEMALE W/C	freshen up	sink toilet dryers	automated dispensers	privacy acoustical control climate control

SECOND FLOOR: DEPARTURES

ROOM NAME	ACTIVITIES	NEEDS	TECHNOLOGY	EMOTIONAL NEEDS
ENTRANCE + EXIT	passing through	free of obstruction	automated doors	gradual shift from dark to light
DEPARTURES CONCOURSE	waiting	seating	security cameras	natural light comfort security views to outside
CHECK-IN COUNTERS	waiting working reading communication	display work surface task light task seating computer usage storage telephone calls privacy	computer security cameras telephone wireless internet check-in kiosks automated bag drop	comfort security natural light connection to nature acoustic control
PASSPORT CONTROL	waiting working reading communication	work surface task light task seating computer usage storage telephone calls privacy	computer security equipment security cameras telephone wireless internet	comfort security natural light connection to nature acoustical control discreet
RESTAURANT + RETAIL SPACE				
TRANQUILITY GARDEN	lounge walking resting	seating table eat	security cameras wireless internet	comfort natural light & view climate control
DEPARTURES LOUNGE	sitting waiting walking work/read/music shopping resting	seating table eat power outlet explore communication	computer security cameras telephone wireless internet	relax natural light & view security climate control acoustical control

ROOM NAME	ACTIVITIES	NEEDS	TECHNOLOGY	EMOTIONAL NEEDS
DEPARTURE GATES	waiting service reading communication	work surface computer usage task light task seating telephone calls storage privacy	computer security cameras telephone wireless internet	relax natural light & view security climate control acoustical control
MALE W/C	freshen up	sink toilet dryers	automated dispensers	privacy acoustical control climate control
FEMALE W/C	freshen up	sink toilet dryers	automated dispensers	privacy acoustical control climate control

THIRD FLOOR: IN BETWEEN TRAVEL

ROOM NAME	ACTIVITIES	NEEDS	TECHNOLOGY	EMOTIONAL NEEDS
AIRSIDE LOUNGE	waiting wireless communication work read	seating privacy	wireless internet security cameras telephone	natural light & view privacy safe climate control comfort relax acoustical control
INTERNATIONAL GARDEN	waiting wireless communication work read	seating privacy surface space	wireless internet security cameras telephone	natural light & view comfort relax privacy natural light & view climate control acoustical control
MALE W/C	freshen up	sink toilet dryers	automated dispensers	privacy acoustical control climate control
FEMALE W/C	freshen up	sink toilet dryers	automated dispensers	privacy acoustical control climate control

Table 5. Space Planning by Floor

According to the International Air Transport Association (IATA), the Level of Service (LOS) for individual space requirements are as follows:

Space	Minimum Requirements	Acceptable Requirements	Exceeds Requirements
Waiting Areas	1.9 m ²	2.3 m ²	2.7 m ²
Baggage Reclaim	1.6 m ²	1.8 m ²	2.0 m ²
Check-in Counter	1.4 m ²	1.6 m ²	1.8 m ²
Holding Room Inspection	1.0 m ²	1.2 s m ²	1.4 m ²

Table 6. Individual Space Requirements

Spatial Requirements and Analysis

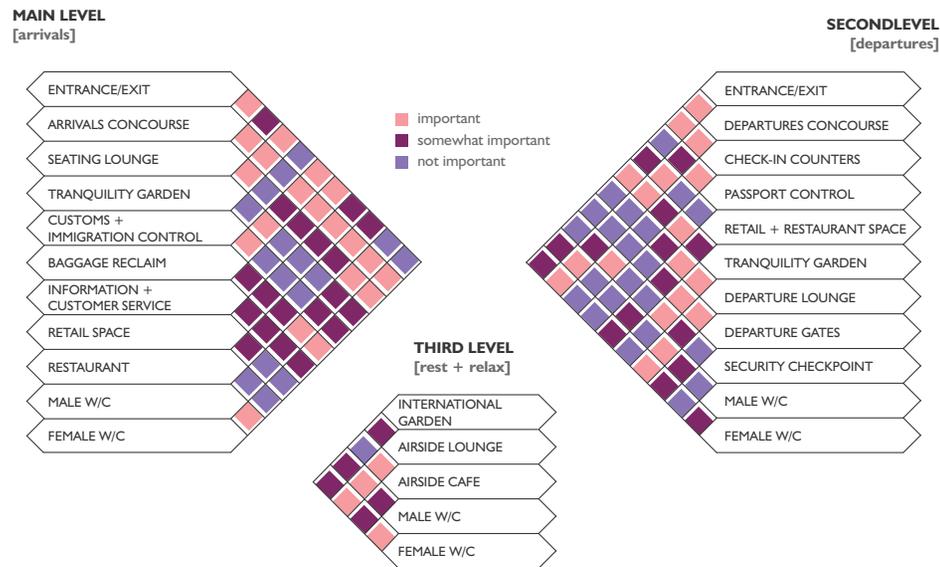


Figure 19. Programme: Adjacency Matrix

Space Requirements

Check-In Area

- Located near the entrance
- Open space planning
- Wide circulation paths to accommodate for luggage
- Ample daylight penetration and views to outside
- Clear sight lines to destination
- Calm atmosphere
- Adjacent to security checkpoint

Baggage Area

- Easily accessible after deplaning
- Located with clear sight lines to the exit
- Wide circulation paths to accommodate for luggage
- Adjacent to services (ie. Information, hotel, currency exchange)

- Restaurant & Cafés
- Adjacent to waiting lounges
 - Views to nature and daylight penetration
 - Café hours extend to accommodate late departures or late arrivals
 - Interactive environment
 - Ample space to accommodate carry on luggage
 - Variety of food and beverage choices available
 - Access to wireless internet
- Retail Area
- Adjacent to waiting lounges
 - Views to outside and daylight penetration
 - Interactive environment
- Garden
- Adjacent to waiting lounges
 - Views to nature and daylight penetration
 - Calming and relaxing environment
 - Ample space to accommodate carry on luggage
 - Access to wireless internet
- Lounge/Seating Area
- Adjacent to departure gates and retail area
 - Views to outside and daylight penetration
 - Calming environment
 - Ample space to accommodate carry on luggage
 - Access to wireless internet
 - Booths for telephone and mobile phone privacy

Zoning Analysis

Horizontal Circulation

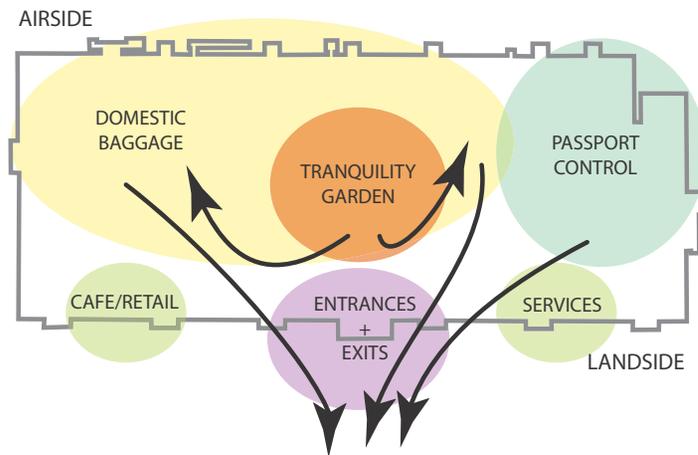


Figure 20. Main Level Circulation Paths

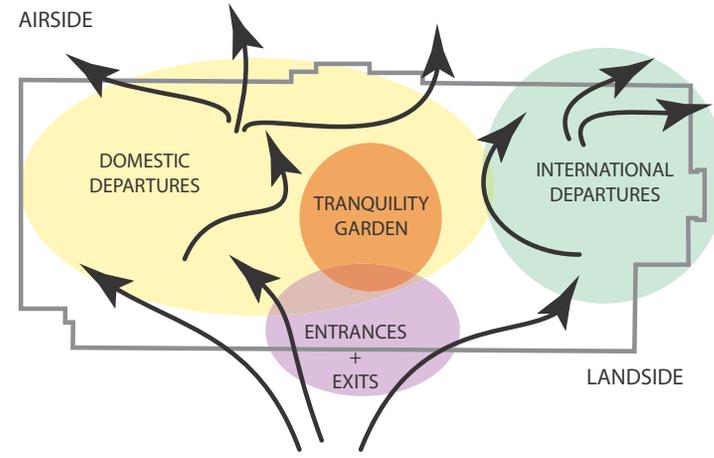


Figure 21. Second Level Circulation Paths

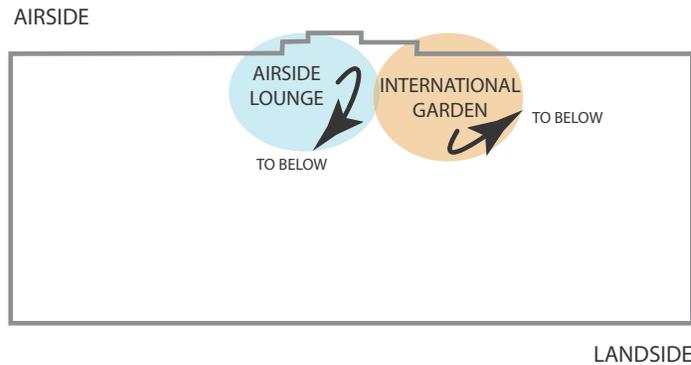


Figure 22. Third Floor Circulation Paths

Vertical Circulation

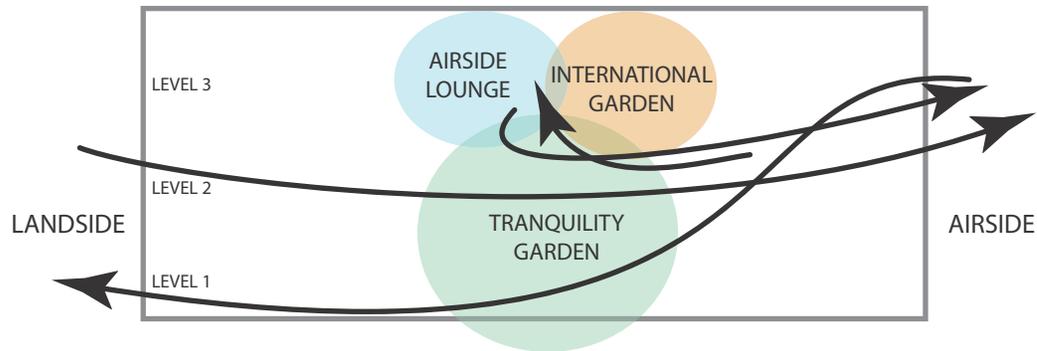


Figure 23. Vertical Circulation

Universal Design Requirements: According to the 2009 International Building Code

Accessible Routes

- Mezzanines and similar multilevel spaces must be connected by an accessible route unless they are under 3,000 sf in area.
- Within a building, an accessible path of travel is to be provided from accessible entrances to each portion of the building. The accessible route must not be seen as a second-class way of moving about in the building. The accessible route should correspond to or be near the general circulation path. Where circulation paths are interior and thus protected from the elements, the accessible route must be on the interior as well.

Accessible Entrances

- One main entrance, and at least 60% of the total of all entrances, to a building must be accessible. Where there are separate tenant space the same criteria apply to the entrances for each tenant space. The only exceptions are entrances not required to be accessible or loading docks that are not the only entry to a building or tenant space.
- When entrances to the building serve accessible adjunct facilities, such as accessible parking areas, passenger loading zones, transit facilities or public streets, then at least one of each of the entries serving those functions must be accessible. The design of the accessible route and entrance systems cannot require people with disabilities to traverse long distances to get from one accessible facility to another.

Parking and Passenger Loading Facilities

- Parking is to be located such that the accessible route of travel is the shortest possible path from the parking area to the nearest accessible building entrance.
- For buildings with multiple accessible entrances and adjacent parking, accessible parking is to be dispersed in such a way as to have accessible parking nearby each accessible entrance.

Other Features and Facilities

- All toilets rooms and bathing facilities are required to be accessible. The facilities are to provide equal access to all of the functions provided in them.
- Passenger elevators on an accessible route are required to be accessible.
- Passenger transit platforms without guards are required to have detectable warnings at the edge to warn people with visual impairments of the falling hazard at that edge.
- Seating at tables, counters and work surfaces requires that 5% of seats at fixed or built-in tables or work surfaces to be accessible if they are on an accessible route.

- Customer–service facilities for public use on accessible routes. These facilities include food service lines, and waiting lines.
- Signs require the international symbol of accessibility to be located at accessible parking spaces, accessible areas of refuge, at accessible toilet locations, and at accessible entries.

Accessibility for Existing Buildings

- Where an alteration affects the accessibility of the route to the area of primary function, or the alteration work involves the primary function area, the route must be made accessible. This route must also provide access to toilet facilities and drinking fountains serving the area of primary function.
- The intent of alterations is to ensure that accessibility occurs to the maximum extent feasible. The extent of these requirements are directly related to their proximity to the area of alteration. Accessibility should be provided throughout the structure to the maximum extent feasible.
- When new escalators or stairs are added in existing buildings where none existed previously, an accessible route must be provided

Supplementary Accessibility Requirements

- Where permanent signs for rooms or spaces are provided at doors, the signs are required to be tactile. Where pictograms are provided as the permanent designations of permanent interior rooms, the pictograms are to have tactile text descriptors. Directional signs for permanent interior locations except for building directories and personnel names and temporary signs should also be accessible. This is another instance where these requirements should be allowed regardless of local adoptions. The Americans with Disabilities Act Accessibilities Guidelines for Buildings and Facilities (ADAAG) should be reviewed along for signage requirements.

Sensory Requirements

Visual

- Materials reflect modernity like the original façade of the building
- Seamless integration of technology throughout between the building and user
- Source of materials is local

Sound

- Use acoustic insulation with high R factors for wall partitions and ceilings
- Materials and finishes will limit sound transmission and reflectance, especially in large open spaces

Lighting

- Daylight penetration in space will reduce energy consumption
- Glazing with low E rating will help spaces keep cool in the summer and retain heat in the winter
- Ambient light will help create a calming and comforting atmosphere
- Downlighting will provide light when daylight is unavailable

Colour

- Colour palette will reinforce the feeling of calm
- Accent colours will help define zones and aid wayfinding

Tactile

- Textured materials will help differential spaces and stimulate the senses
- Automatic sensors will be used for doors, sinks, dryers, etc.
- Surfaces in public areas should be easy to clean and maintain

Odour

- Variety of plants in the garden and seating areas will provide aromatherapeutic qualities

Mechanical Requirements

Heating and Cooling

- Programmed to adjust to outside and interior temperatures through a central system

Plumbing

- Low flow toilets and fixtures in all water closets

Electrical

- All electrical outlets in water closets will have ground fault interrupter (GFI)
- All electrical outlets to be surge protected
- Wireless internet availability in all public spaces

Lighting

- All lighting fixtures to be compact fluorescent for reduced energy consumption
- Occupancy sensors will used
- Emergency lighting provided at level changes, stairs and exits and entrances.

Introduction

Imagine an airport terminal building that entices you and positively challenges all your senses. Your senses are overwhelmed with anxiousness and excitement as you make your way leisurely towards the departure gate at the opposite end of the airport. Despite the trip to the airport taking longer than expected, you feel considerably more comfortable and safe as you recall the check-in procedure being smoother and more uncomplicated than the last trip. The large windows light your path brightly as the sun shines through some of the coloured glass. It reminds you of dawn, or is it dusk? You can't decide. What you do know is exactly where you are going. The colour, pattern, and artwork tells you exactly where your destination is so you are not worried about getting lost. Taking a break on a nearby bench, you realize that Manitoba is the common theme throughout the airport. Tidbits of history, facts about Winnipeg and Manitoba remind of your childhood and stories grandpa used to tell as you sat on his knee. You smile as you recall these memories.

The goal is to create an inviting place that is uplifting and transforms the travelling experience into one that is pleasant, relaxing, and enjoyable. It is a place that recalls the history, culture, and environmental region of Winnipeg and Manitoba that is explored through modern design trends. Essentially, it is a transitional place that celebrates the excitement of air travel.

The Winnipeg Airport will strive to be this kind of place. The design of the airport will be an engaging experience that promotes relationship building between travellers and their surrounding environment. It will help foster the mindset that the prospect of air travel can be as exciting as a trip to a special shopping district or visiting an art gallery. For elderly travellers, the airport interior will enable their needs and requirements to be met ahead of all others, and will fulfill them. Using nature and culture as inspiration and drawing from research, theories, precedents, site analysis, and design programming presented in the previous chapters, the Winnipeg Airport will demonstrate how interior design can positively affect the journey of air travel.

The research and project introduction in Chapter One expresses the need to consider the elderly population when they travel. The literature review and theory discussed in Chapter Two explores three important issues related to interior design and air travel among the elderly. This became the conceptual starting point for exploring the ability for transitional space to become a place-making experience, the perception of security in such a public place, and how the elderly viewed security and surveillance coupled with challenges that they encounter on a day-to-day basis. In the third chapter, several precedents that explored a range of different case studies that addressed the topics from the literature review. These precedents each addressed different design goals and challenges unique to each project. Analyzing these examples helped formulate the initial stages of my design concept by informing me about the pros and cons that I should consider for my project. The fourth chapter documents the history of and connection between the surrounding environment and the site, and who the client and user group are, including their needs and requirements. This chapter will describe my final design proposal for the airport as a transitional transportation facility. This final design is a fusion of research, information, and inspiration derived from trend analysis, literature review, precedent analysis, and an exploration of Manitoba's history.

Design Overview

The design for this practicum will oversee the redesign of the old Winnipeg Airport, a three-storey 400,000 square feet structure located at 2000 Wellington Avenue in Winnipeg, Manitoba. It will involve adjustments and changes to the exterior façade to better accommodate the goals of the airport. In addition, several structural columns will be demolished and the weight of the ceiling redistributed into transfer beams and surrounding columns to help impose the impression of a column free interior.

The interior of the old Winnipeg James Richardson International Airport will be transformed into a twenty-first century modern day airport that caters to the modern day traveller, and will take into account the trends in airport and travelling. The airport design will pay particular attention to the needs and requirements of the present day elderly traveller. To support these design requirements, the spatial arrangement of the airport will break the space up into horizontal and vertical zones. The arrivals area will occupy the first level, followed by the departures area on the second level, and finally the transitional lounge area and offices on the third level. All the levels will include a centralized garden feature among other elements that will express the Manitoban landscape physically or representatively. The basement, where mechanical, electrical systems and other maintenance related operations are located, will not be included in this project.

Design Exploration

As discussed in the previous chapters, the Old Winnipeg International Airport was built in the International Style. As such; the architectural structure and elements are rectilinear and minimalistic in design. The airport has undergone many stages of renovation since its construction in 1964, but they were primarily attempts to simply maintain the functionality of the constantly changing airport. Given the prestige of air travel, the initial design by Green Blankstein Russell and Associates called for a highly simple, linear design that saw the main level as a large open space accommodating both the arrivals and departures area. The

second level was dedicated to a luxurious lounge that overlooked the main level. It was a place where travellers could relax before departing on their flight. As time passed, changes to the airport became necessary as the travelling population began to grow and issues of security began to mark its presence. Instead of expanding, the airport began to subdivide and alter the space while keeping with a linear movement.



Figure 24. Exterior Facade - Winnipeg Airport 2010

From an observational and personal standpoint, the resulting design alternations and renovations left travellers with the impression that the airport terminal was cramped and relatively small in size, with few amenities that were far away from one another. Despite its ample open space on the second level, the spatial planning of retail, restaurant, and lounge space lacked a cohesive design language. The absence of structure, hierarchy, and poorly utilized space were its shortcomings. In addition to the problems mentioned, the overall materiality and inadequately lit interior gave an aura that the airport terminal was unkempt.



Figure 25. Interior from Second Level - Winnipeg Airport

Another issue that arose at the old Winnipeg International Airport is the affect cleanliness and maintaining the environment has on the traveller. Upon arrival at the airport and noticing that lighting tiles are yellowing and missing, that the blinds covering the windows appear dusty, and the overall atmosphere emits a bland grayish-beige hue, the traveller is confronted with mixed feelings. None of these feelings are conducive to creating a safe, comfortable, and positive experience. Without these positive reinforcements, the airport is simply a space that exists purely based on necessity. It does not enhance the travelling experience nor does it foster identity and place-making abilities.

To the visiting traveller, the qualities aforementioned could negatively affect their personal reflection of the airport with the city of Winnipeg and the province of Manitoba. Whilst the interior of the airport was in a state of disarray, the exterior façade remained unchanged through the years and falsely projected the image that the airport was still a modernist structure. Following a long period of debate that examined and reviewed the future of the old Winnipeg Airport, the airport was decommissioned in 2011.



Figure 26. Interior Art: Eli Bornstein - Structural Relief in Fifteen Parts
Interior Art: Eli Bornstein - Structural Relief in Fifteen Parts

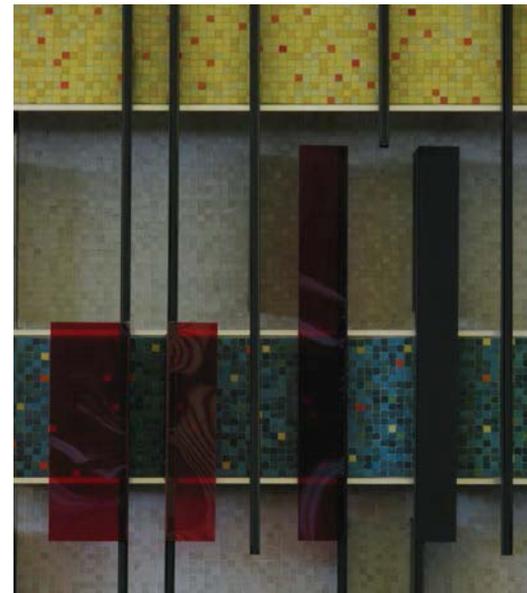


Figure 27. Interior Art: John Graham – Northern Lights

Spatial Organization + Exploration

The current function of the airport does not celebrate the excitement of travel and the environment does not lend itself to project a sense of comfort or security. For visitors and local residents, the blinds covering the windows forced the reliance on artificial lights, prohibiting the idea of freedom. It makes one feel trapped and restricted even through the airport arrivals and departures concourse is a central hub that all building users pass through. Many of the spaces lack visual interest and are fairly dark with little space for privacy. This seems to prolong the passage of time and directly affect the levels of anxiety. It is for these reasons that despite having a large footprint, the challenge was to generate a floor plan that takes into consideration the overwhelming presence of the columns, that addresses daylight penetration into the interior spaces, and that opens up the space to provide travellers with views to the outside. Consequently, I felt that the best way to approach these design concerns was to demolish all interior walls, all non-fire exit staircases, escalators, elevators, and rework the flooring in several areas. Some columns will be demolished to open up the space for a central intervention with the weight distributed evenly to surrounding structural elements. The demolition plan for the old Winnipeg Airport is shown in figure 28.

DEMOLITION PLAN

Level I

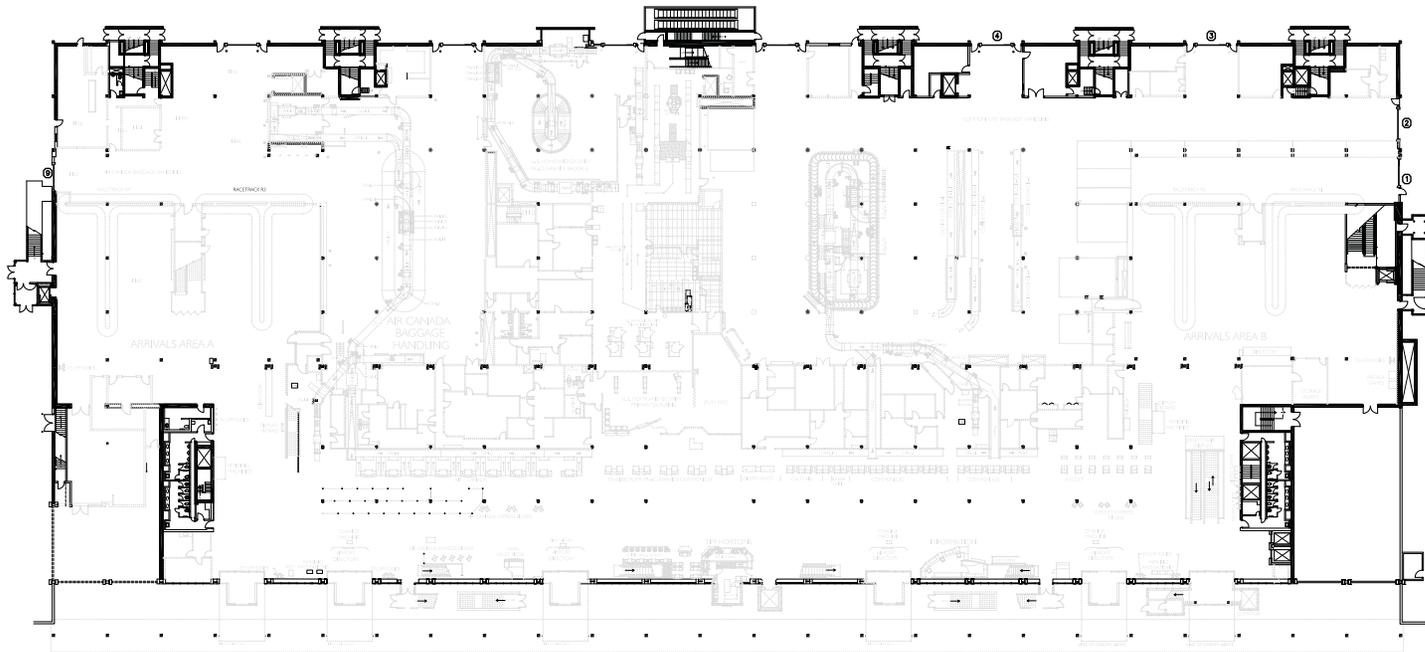


Figure 28. Demolition Plan - Level 1

DEMOLITION PLAN

Level 2

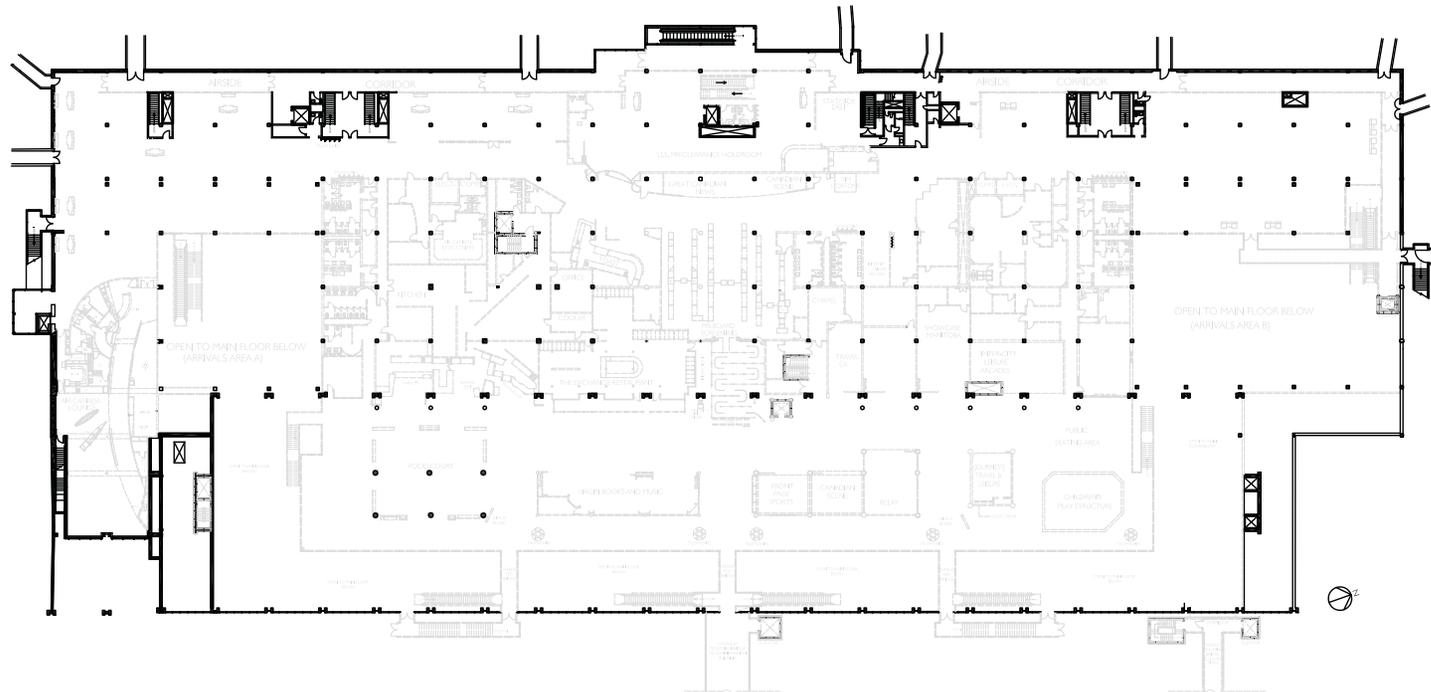


Figure 29. Demolition Plan - Level 2

DEMOLITION PLAN

Level 3

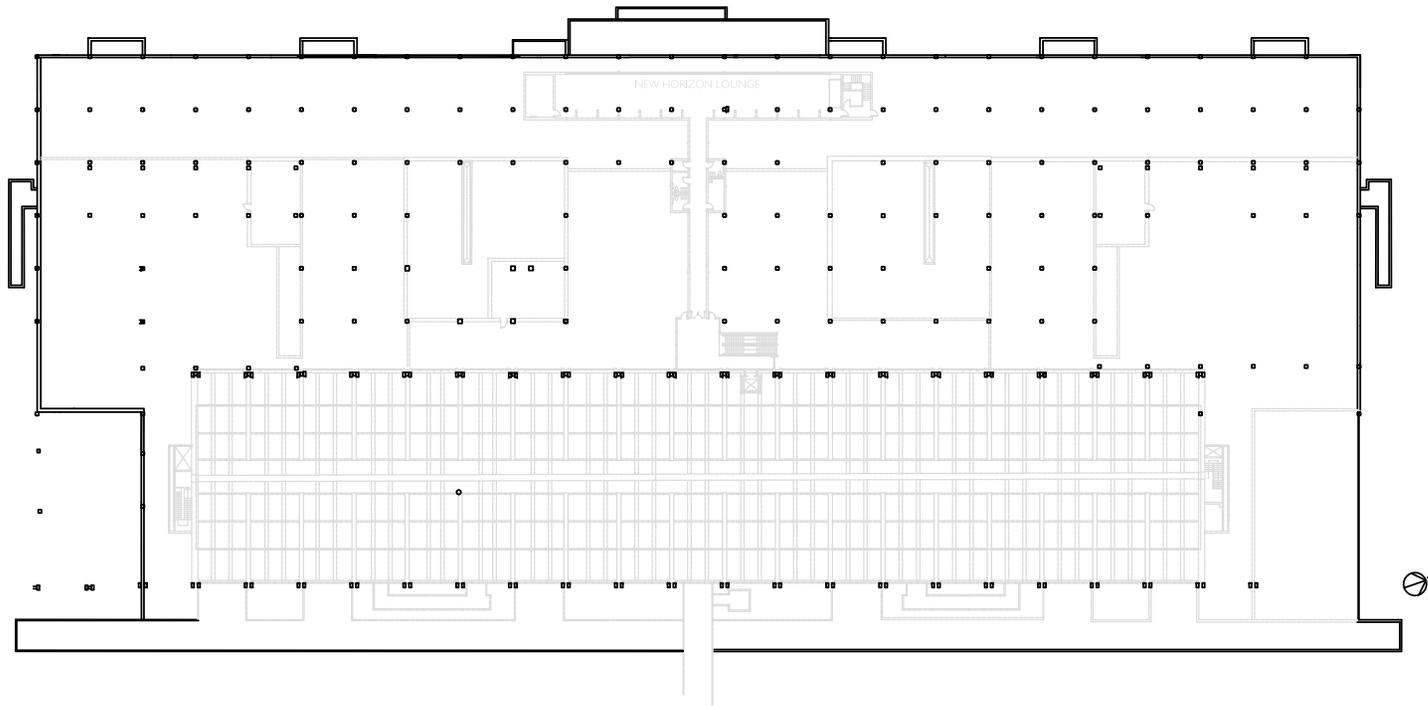


Figure 30. Demolition Plan - Level 3

Following the demolition process of all necessary interior elements, the next step investigated potential spatial layout options that would bring the exterior Manitoban landscape to the interior space and seeking alternatives that would open up the space to create the illusion that the interior was column-free. Informed by the needs of the aging generation and universal design; inspired by the balance of symmetry and asymmetry of modernist interiors, my design process began with exploring organic and curvilinear shapes that would push the boundaries of the linear grid. The initial process attempted to break out of the traditional linear approach and investigate possible layouts that would still function within the pre-existing grid system. This method sought to create a dynamic and engaging interior spatial layout that would trigger place-making memories and experiences.

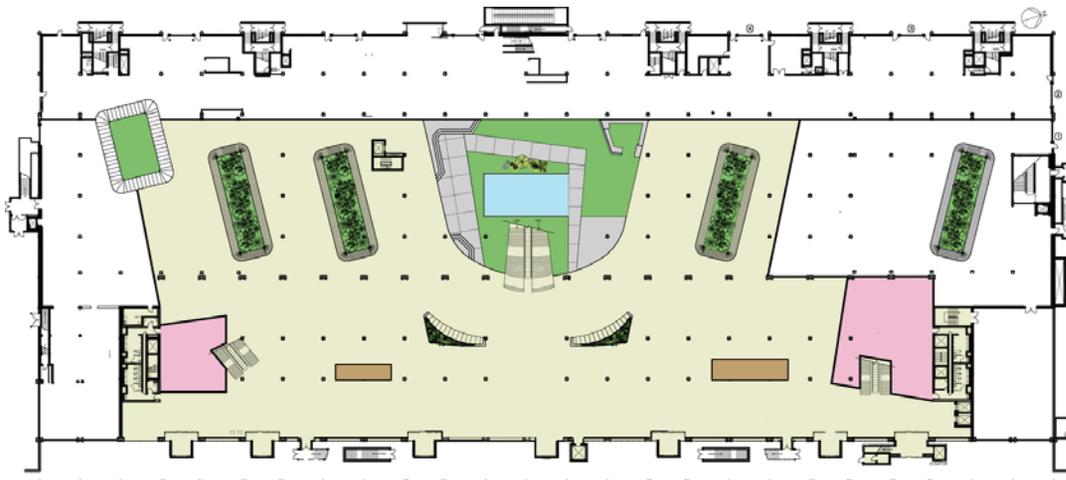


Figure 31. Initial Concept: Arrivals Level (Main)

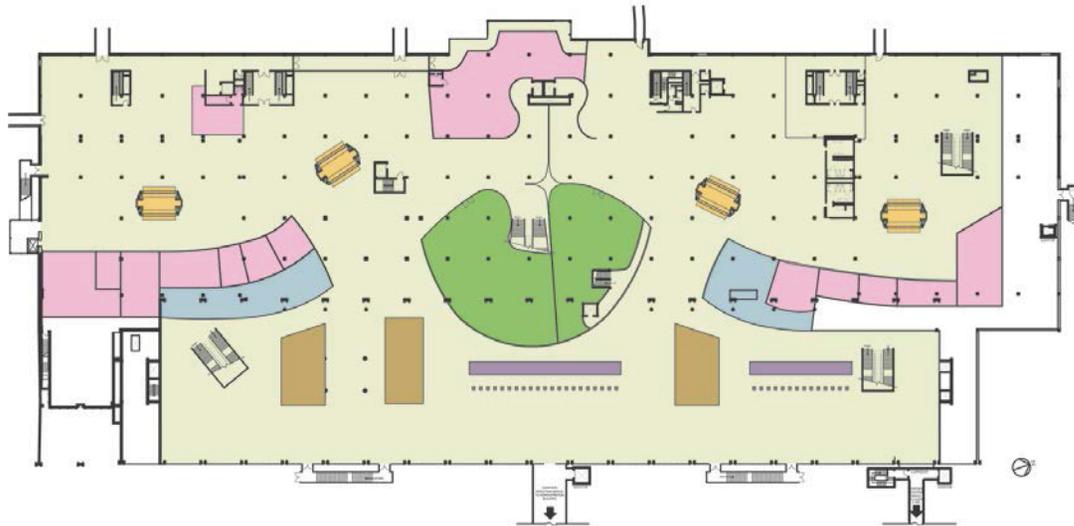


Figure 32. Initial Concept: Departures Level (Second)

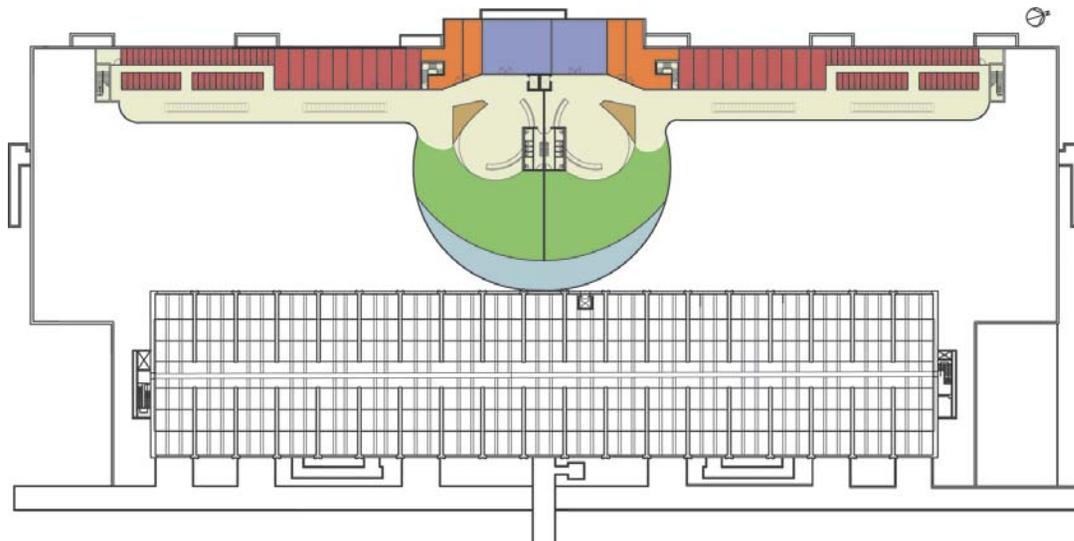


Figure 33. Initial Concept: Rest Level (Third)

Upon reinvestigating this approach, it became clear that this approach did not support the needs of the aging traveller. This initial design concept placed too much focus on creating an interior that was different and did not connect with the exterior façade. Furthermore, the curvilinear approach conflicted with universal design principles, especially for those who were visually and mobility impaired. Although designing for persons with disabilities vary depending to the severity of their impairment, the overuse of curvilinear forms can make wayfinding more challenging to these individuals according to the AIA (The American Institute of Architects) and CNIB (Canadian Institute for the Blind). The adjustments made to the spatial layout required a return to a primarily linear structure that takes care to find a balance between linear and curvilinear forms. This approach also addresses the issues of surveillance through eliminating hidden corners and maintaining a sense of openness as discussed in the literature review.

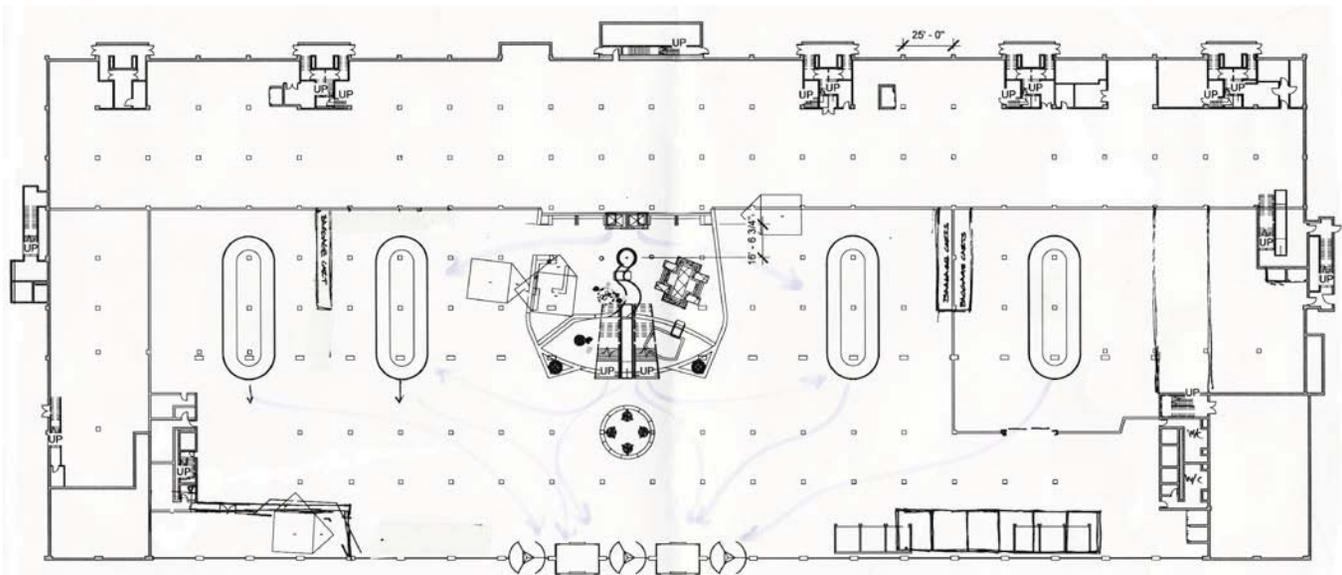


Figure 34. Second Concept Sketch: Arrivals Level

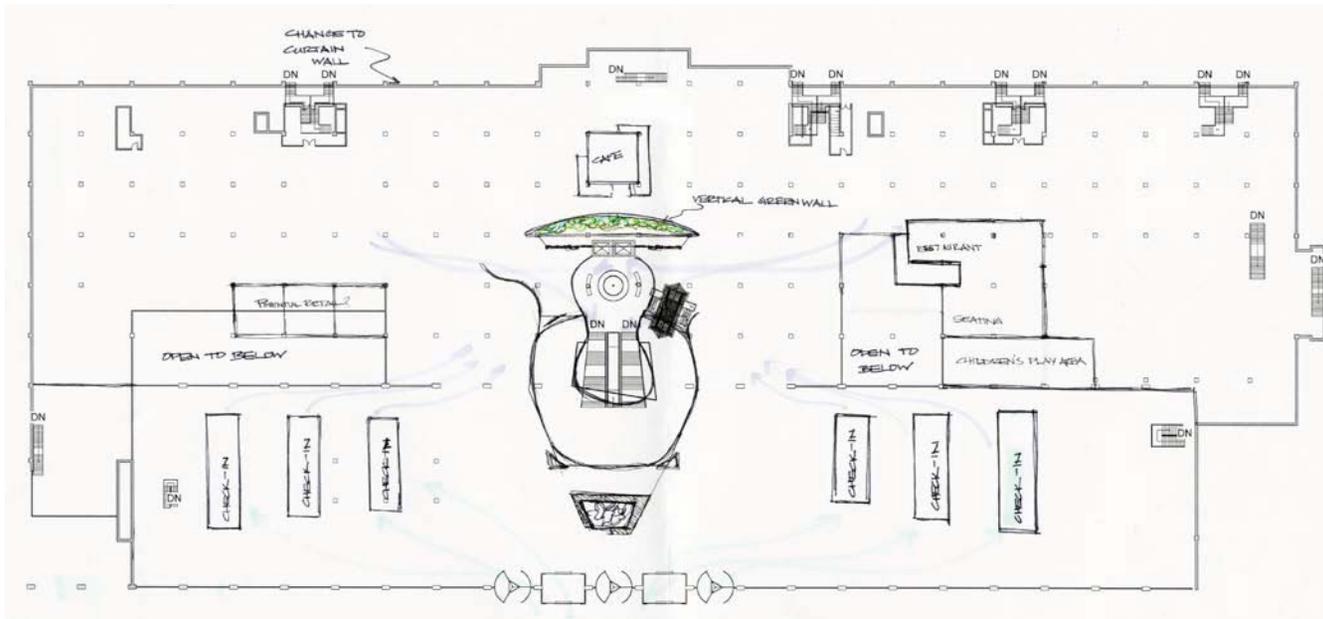


Figure 35. Second Concept Sketch: Departures Level

The overall design language that the Winnipeg Airport will convey an overtone of minimalism yet accented by simple organic lines that will highlight the central feature. Two of the most important elements in this project involved creating a central welcoming hub at both the arrivals and departures level and a check-in counter that would solidify the design language and aesthetics throughout the space. This sketch of the check-in desk, figure 58, illustrates the ideation and methodology I would like to convey throughout the space. The openness, use of colour and material choices reflects the importance of sightlines, positive emotional responses while being conscientious about comfort and approachability.

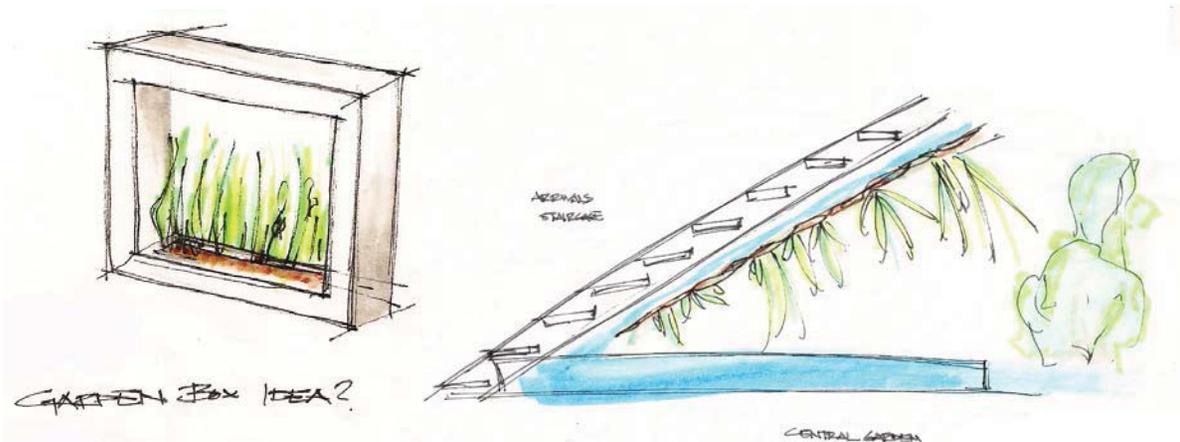


Figure 36. Concept Sketch: Signage

Figure 37. Concept Sketch: Integrating Nature



Figure 38. Concept Sketch - Departures Lounge

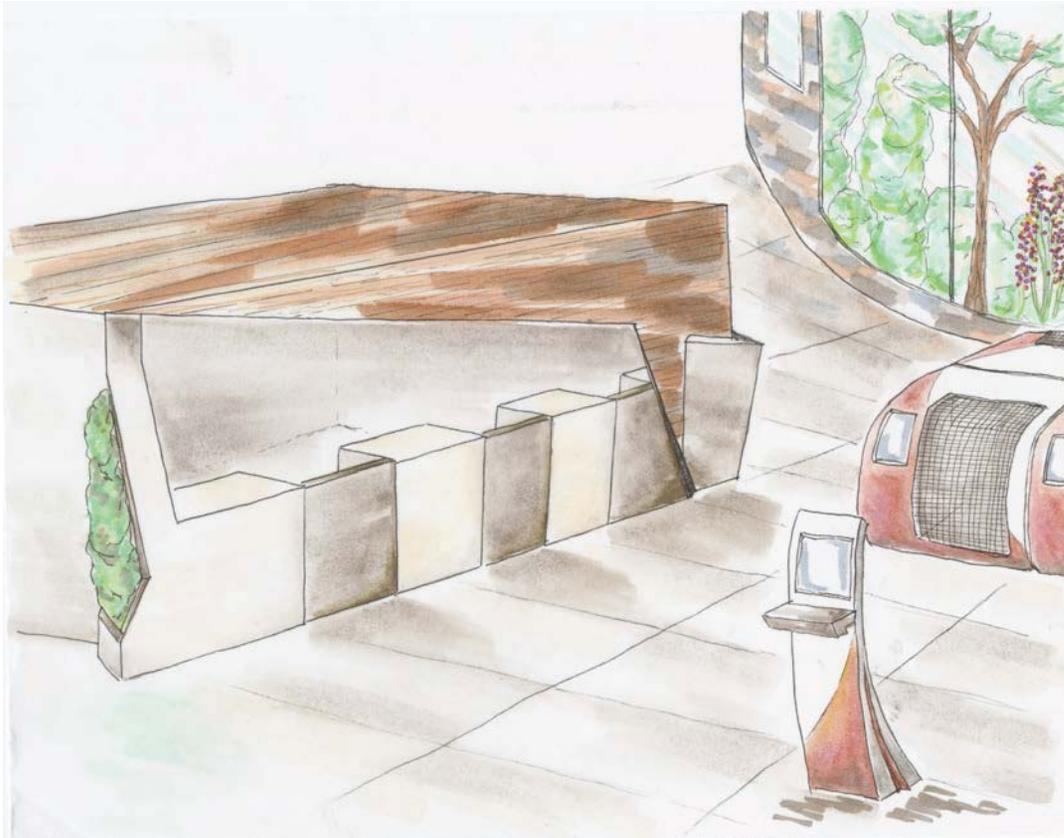


Figure 39. Concept Sketch - Check-in Counter Desk

In this sketch for the central garden intervention, my intentions are to explore the connection between people and the natural environment. It reflects the volumetric experience I would like travellers to experience as they descend from the arrivals gate to claim their baggage. It also serves to welcome guests to the airport whether they are departing on a flight or picking up a guest from the airport. The drawing also emphasizes the importance of movement, exploration, and providing areas that lends itself to the impression of privacy. The materiality brings a sense of Manitoban landscape into an interior space. Additionally this drawing

seeks to find the balance between asymmetry in a space that is mostly symmetrical and to continue this balance through the design of the airport terminal.



Figure 40. Concept Sketch - Tranquility Central Garden

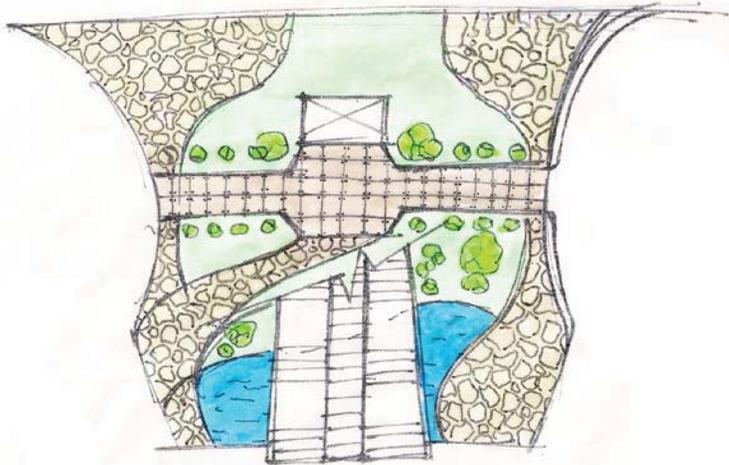


Figure 41. Concept Sketch: Tranquility Central Garden - Arrivals Level

Site Plan

The airport terminal itself is a building where certain areas are subject to strict design and security guidelines. These guidelines also apply to the surrounding site in addition to safety requirements that are required to ensure aircraft landings and take offs are free from obstacles. These guidelines are also set in place to ensure that the surrounding communities are not affected by noise pollution and aircraft emissions. Specific to the site surrounding the airport terminal are runways, taxiways, aprons, and holding bays, all of which are vital in the operation of the airport. The use of landscaping can help reduce visual intrusion to the surrounding communities and create buffer zones that will help mitigate air pollution and the perception of noise (Kazda and Caves 2000, 337). However, it is important that the selection of vegetation does not encourage birds to gather. For the purpose of this project, the site surrounding the immediate area around the airport terminal building along the east, west, and north wall will remain unchanged to provide an uninterrupted view of the natural prairie landscape. The front entrance at the south will undergo changes to provide a dual level approach at both the arrivals and departures level. This will help reduce traffic

congestion and clarify the separation of vehicular traffic, allowing travellers to efficiently and effortlessly navigate to their choice of transportation – whether it is car, taxi, or bus. At the south façade, the entrances and exits at the departure and arrivals levels will utilize minimal landscaping. This will act as a landmark that designates this zone. Only the south wall will be accessible to travellers with the north, east, and west wall closed off to the public. This model will also prepare the Winnipeg Airport for future growth that could potentially see a train or railway system. In keeping with the requirements of safety and security, surveillance cameras placed subtly near the entrances will support the physical presence of security personnel who will either be uniformed or dressed as civilians. Recalling the discussion of the perception of security among the elderly from the literature review, the physical presence of security personnel will add a level of comfort to this group of travellers.

The Exterior Façade

The existing east and west sides will be transformed into a curtain wall from its original brick structure to allow the penetration of natural sunlight into the interior. This will allow minimal use of artificial lighting in the interior during the daytime and will also enhance the views to the exterior and provide travellers with a sense of direction when navigating through the interior. These changes will allow the airport to capture the light from the rising and setting sun and portray the passage of time as well as extend the exterior into the interior. The use of lighting controls will be utilized to manage the sunlight coming in from the east and west. Since the relative size of the airport is fairly small for its typology, opening up these exterior walls can create the illusion that the space is larger than in reality because there is no definitive wall that signals the boundaries of the airport.

The south side of the building has undergone some changes, from spreading entrance across the front of the façade to grouping them at the center. This will centralize the entrances and exits and ensure that all travellers will encounter the same experience as they cross the threshold from outside to inside. In addition, grouping these entrances and exits together will reduce the confusion of which entrance or exit to take in order to “get to the right place.” By eliminating the spread of multiple entrances and exits from the original plan, measures of security become easier to address since there are less areas to monitor.

Windows will be removed from the north side of the building. Glazing will run the full height on each floor. This will allow the flow of daylight into the interior space while providing unhindered views to the outside. This application will also allow travellers to witness the activities taking place on the tarmac – whether it is an aircraft pulling up to the gate, or watching the luggage being loaded or unloaded from the aircraft, or even witnessing a take-off or landing from afar. All of these activities engage the traveller with the experience of air travel and strengthen the memorable experiences that are associated with it.

The modifications to the exterior façade of the Winnipeg Airport will continue to build on the foundation that the building is a modernist structure. However, with the alterations to the east and west side, the building will appear lighter in comparison to its predecessor while projecting a sense of transparency, simplicity, and manifests the idea of connectivity to nature, almost as if the building breathe. The transparency of outside to inside reduces the impact of crossing boundaries and strives to positively enhance the perception of security by giving the impression that “there is nothing and nowhere to hide.”

The Interior Spaces

The architectural language of the interior spaces reflects modernity of the 21st century. It will be influenced by the International style of which the airport was originally built in. Simple and clean lines direct travellers along their path of travel. As they flow along this path, areas of rest are introduced as pauses that allow the body to recollect and breathe. In the design of the interior space, I made sure that at any given point, the traveller is exposed to the views of the surrounding landscape. This, in conjunction with the interior elements that reflect the Manitoban history, landscape, and culture, provides a truly unique experience to be enjoyed by all members of the public and employees inhabiting the space. By doing so, the open space strengthens the feeling being free from scrutiny, encourages the traveller to explore and relax until it is time for them to depart.

Because of the extensive use of glazing and incorporating the columns into a grid that blends seamlessly with the rest of the interior, occupants are provided with an unrestricted view of nature whether it is inside or outside. The interiors are designed to

transition the body smoothly between different types of space and to intuitively guide one to their final destination whether it is the baggage claim or the departure gate. Another design decision involved widening the paths to accommodate a barrier free path for travellers, creating copious amounts of room to meander and flow freely between other travellers. Careful consideration was required to eliminate the potential of blind corners that could affect the perception of security and pose challenges to wayfinding to those with disabilities. Defining boundaries and zones in highly public spaces was an equally important aspect in the design to help travellers understand space. Subtle changes in material help delineate different zones and breaks the space up into smaller cohesive elements that when combined together reflect the overall design intention. All of these design considerations are based from the research and literature reviewed which acted as a general guideline to design an airport that creates positive experiences.

Main Level: The Arrivals

One of the design goals for the main level for the Winnipeg Airport drew upon the theory of place and space through the process of creating and reflecting on memories, experiences by the associating people with nature, culture, and events associated with Winnipeg and Manitoba. This will be expressed through the use of local art work, interior landscaping, and materiality. The main floor acts as a welcoming gesture for all arriving passengers. The majority using this area will be the travellers who have deplaned and are making their journey through the arrivals gate to their way down to the baggage reclaim area to collect their belongings. The second group that will use this area include meters and greeters who are welcoming travellers home, or to the city of Winnipeg. The Tranquility Garden is the central feature that will greet these two groups at the arrivals level. For the greeters, the garden will be bold statement that is easily recognizable as soon as they pass through the front doors. For this group, this garden is a relaxing environment that promotes social interaction and is a stress-free environment that will be a place to wait and congregate as they wait for their friends, family, or guests. As a non-resident of Winnipeg, I do a fair amount of travelling. As such, I have noticed a consistent trend that is unique to the Winnipeg climate. From an observational

standpoint, it is commonplace for large groups of family and friends to gather at the arrivals area to welcome home their friends or family even if that person is travelling by himself or herself. The Tranquility Garden will be well suited to accommodate such gatherings. The garden is a relaxing environment that recalls nature through the use of native plants and a water feature that draws inspiration from the Red River and Assiniboine River. It is also an area for greeters who are waiting for travellers who have unexpectedly encountered a delay in their travel. It is an area that offers some privacy and peace in an otherwise busy and stressful environment.

The arriving passengers will be exposed to a part of the Tranquility Garden as they approach the glass staircase that will lead them down towards the baggage reclaim areas. Signage located at the bottom of the stairs will direct them either to the left or right baggage carousels according to their flight number. Following their descent, the passengers will be exposed to the full impact of the Tranquility Garden as they turn around to head towards the baggage carousels. The visual, olfactory, and auditory impact of the garden will be the first encounter passengers have with natural vegetation. The harmonious blend of excitement and peacefulness will ease the travellers from the confines of the aircraft. It is a place for passengers to meet up with awaiting friends and or family while giving an opportunity for rest while waiting to retrieve their baggage. At the area surrounding the baggage reclaim, oversized soft seating similar to those in the Tranquility Garden will accommodate rest, meetings, and greetings. In the event passengers require airline service and baggage assistance, it is conveniently located along the north wall of the baggage carousels. Making their way from the baggage reclaim area towards the exit, the passenger will be offered a variety of services conveniently located by the exits. Such services will range from traveller information services, vehicle rental companies, hotel shuttle services to retail and food and beverage services. The large windows, use of vibrant colours, and overhead signage located above the exits will direct passengers through the exit and beyond to awaiting transportation services.

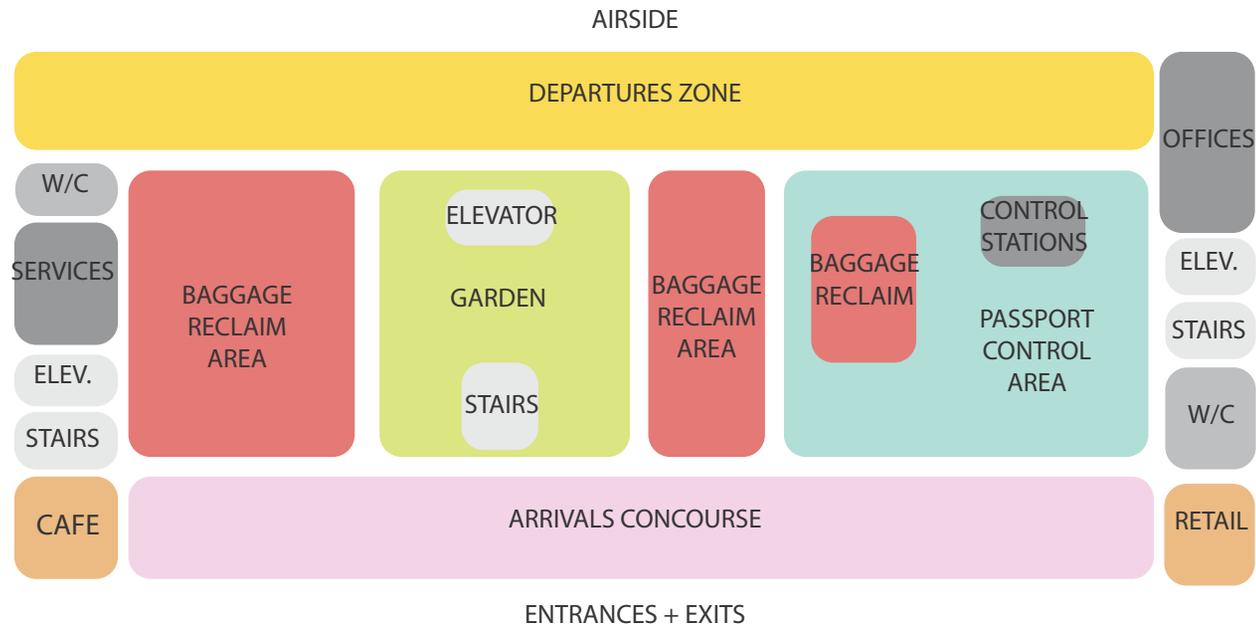


Figure 42. Spatial Zoning Diagram - Main Level

Second Level: The Departures

The departures level on the second floor is significantly busier in comparison to the main floor. This level is most conducive to stress and anxiety because travellers entering arriving at the airport are already in a state of stress. Depending on their personality, these stress levels will differ. From the moment they leave their dwelling they are in a state of distress; they may worry about the flow of traffic - if there could be a traffic delay, and how long it will take to arrive at the airport. Upon arriving at the airport, the traveller is then subjected to the stress of finding the right entrance followed by finding the correct check-in counter. It is on this level that the theories of surveillance, space and place, and the ecology of aging come together to create an

atmosphere that is universally designed to meet the needs of the elderly and at the same time eases stress and tension by creating a safe and comfortable environment. While it is evident through the literature review and research that everyone's needs and ideas of comfort and security are different. Various strategies are implemented to accommodate the needs and requirements of the general populace. Much like the lower arrivals level, upon passing through the centrally located automatic doors, the customer service and security desk greets the passenger along with two floor signage systems that will direct passengers to their designated check-in desk. The Tranquility Garden and large sculptural art in the background greets travellers and provides a central meeting spot. However, the Tranquility Garden is only accessible to passengers once they have passed through the security checkpoint. Circulation paths and colour play a crucial role in wayfinding on the departures level. In addition, airport staff will be readily available to provide assistance where needed to assist in the smooth transition of passengers from the outside in a efficient, quick, yet comfortable process.

After completing the check-in process, the passengers will be intuitively funnelled towards the security checkpoint. Domestic flights will enter from the left of the garden while international departures will enter from the right of the garden. Passing through this area, passengers will find themselves at the departures lounges and gates. Overhead signage will direct passengers to their gates, and the location of the Tranquility Garden and Airside Lounge. Similar to the check-in counter, these gates will be clearly labelled with colour and graphical elements, directing travellers on towards their final destination. However, if the passengers has ample time to spend or has found themselves caught in a delayed flight, or needs a place where they can be at peace, the Tranquility Garden is an area that can accommodate the passage of time. Like the lower level, the garden acts as a pause in a time of stress and anxiousness. Closed off from the rest of the airport, the garden is a space that allows the passenger to enjoy the sounds of flowing water, the smell of native plants.

Upon exiting the garden, the wide corridors allow passengers to weave in and out of the passenger traffic with ease. Areas of pause are incorporated along the path of travel as rest spots, retail, and restaurant spaces. Views to the outside are unobstructed and can be viewed from any given point at the departures area. The use of glass provides family and friends accompanying the traveller to the airport can see each other even if they are at opposite sides of the airport.

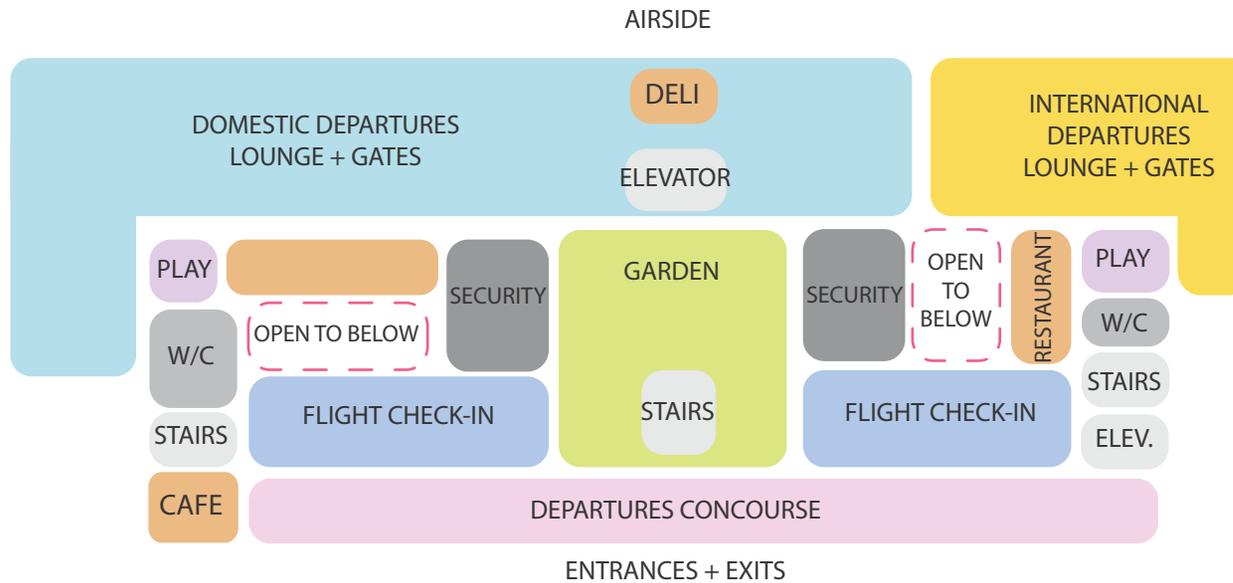


Figure 43. Spatial Zoning Diagram - Second Level

Third Level: Lounge + Offices

The third level at the airport will be the Airside Lounge that overlooks the tarmac. This space is for the traveller who wants to escape from the noise of the departures level. This area will be accessible by elevator and is considered to be a peaceful space. With views to the outside, it is an additional waiting area that travellers feel safe and comfortable in.

The International Garden on this floor is a smaller yet quiet and intimate space that is only accessible to international passengers. It provides a place for quiet reflection and eases the stress of travelling with the views overlooking the tarmac and surrounding ground outside, the living garden wall, and the central fire pit. This space is accessible by elevator and stairs.

Occupying the rest of this floor are the airport offices that oversee the management, operation, and security of the airport.

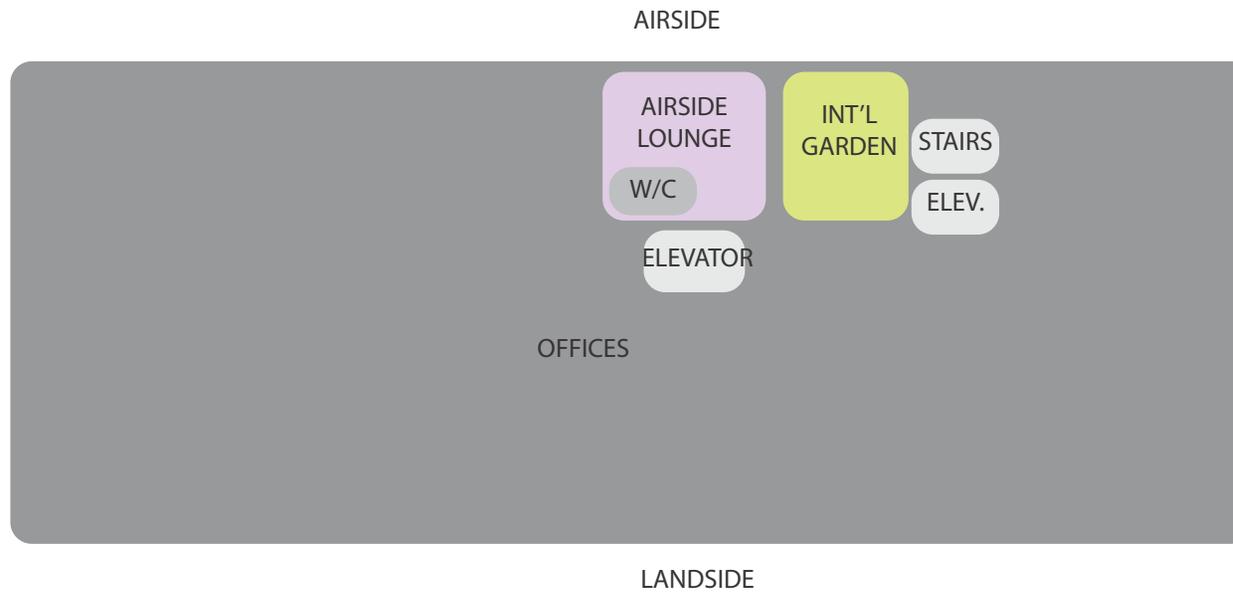


Figure 44. Spatial Zoning Diagram - Third Level

The Journey Through the Airport

The following diagrams depict the journey through the airport on the main, second, and third level. Areas of security, rest, and wayfinding are shown accordingly.

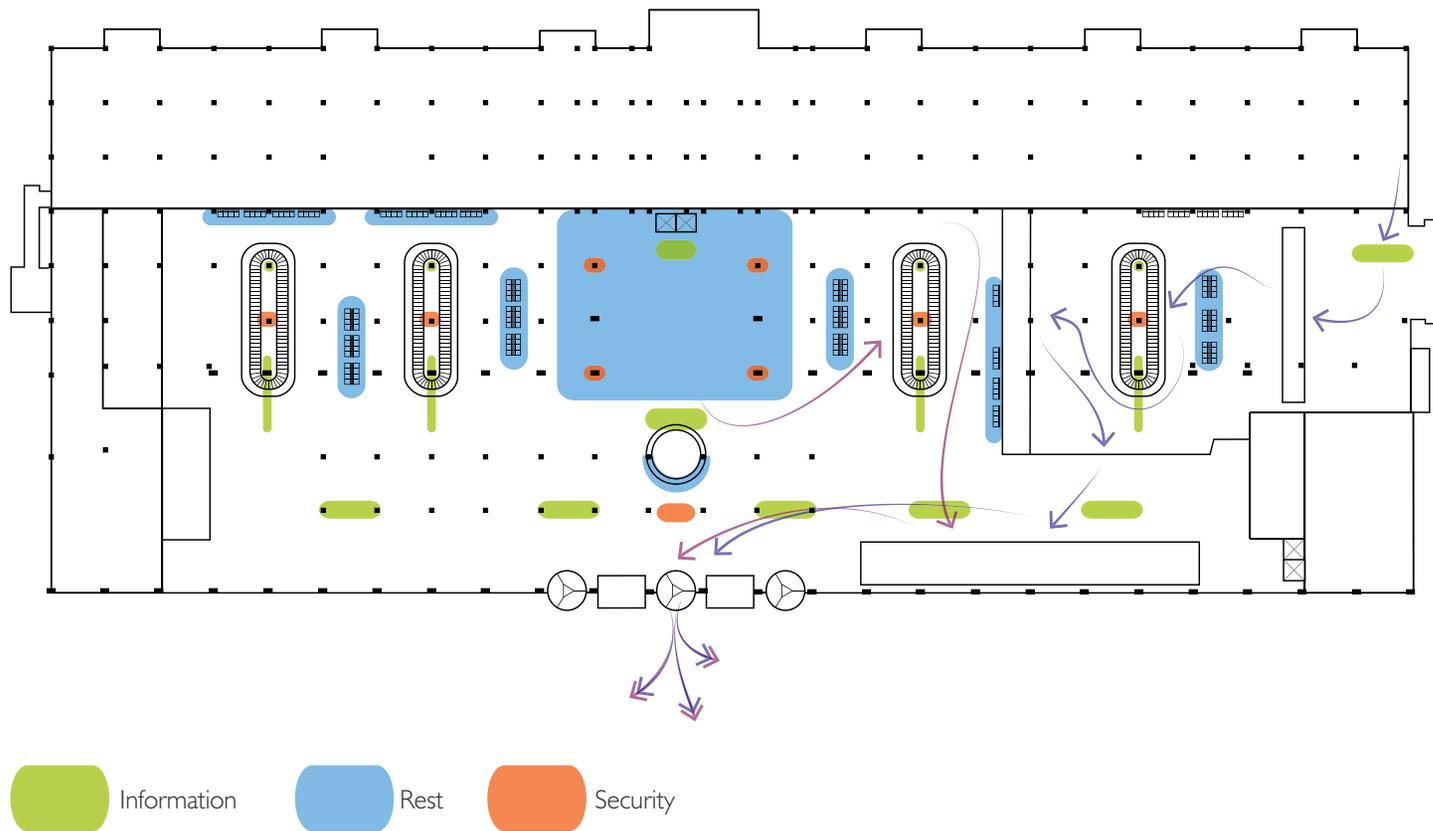
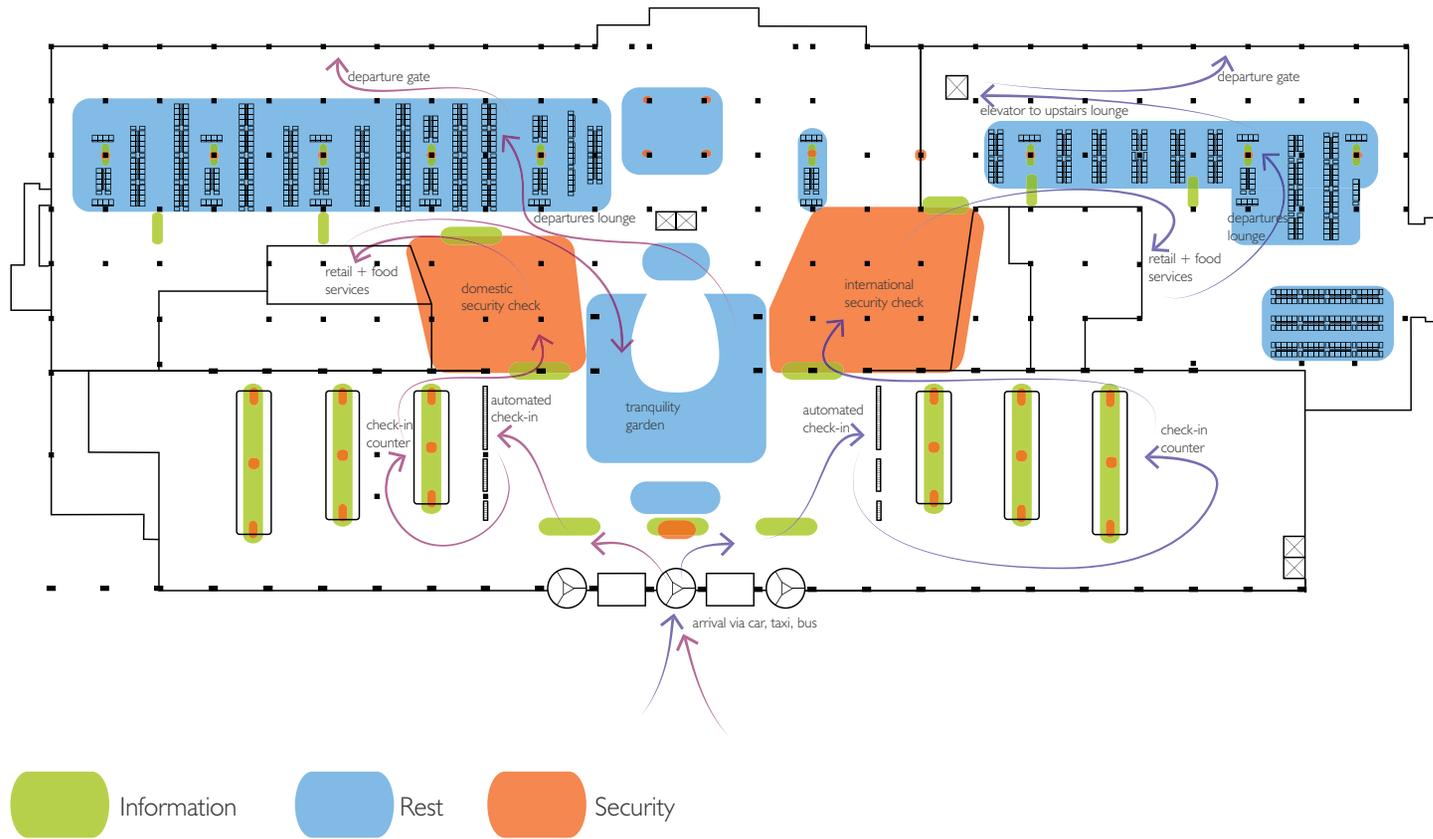
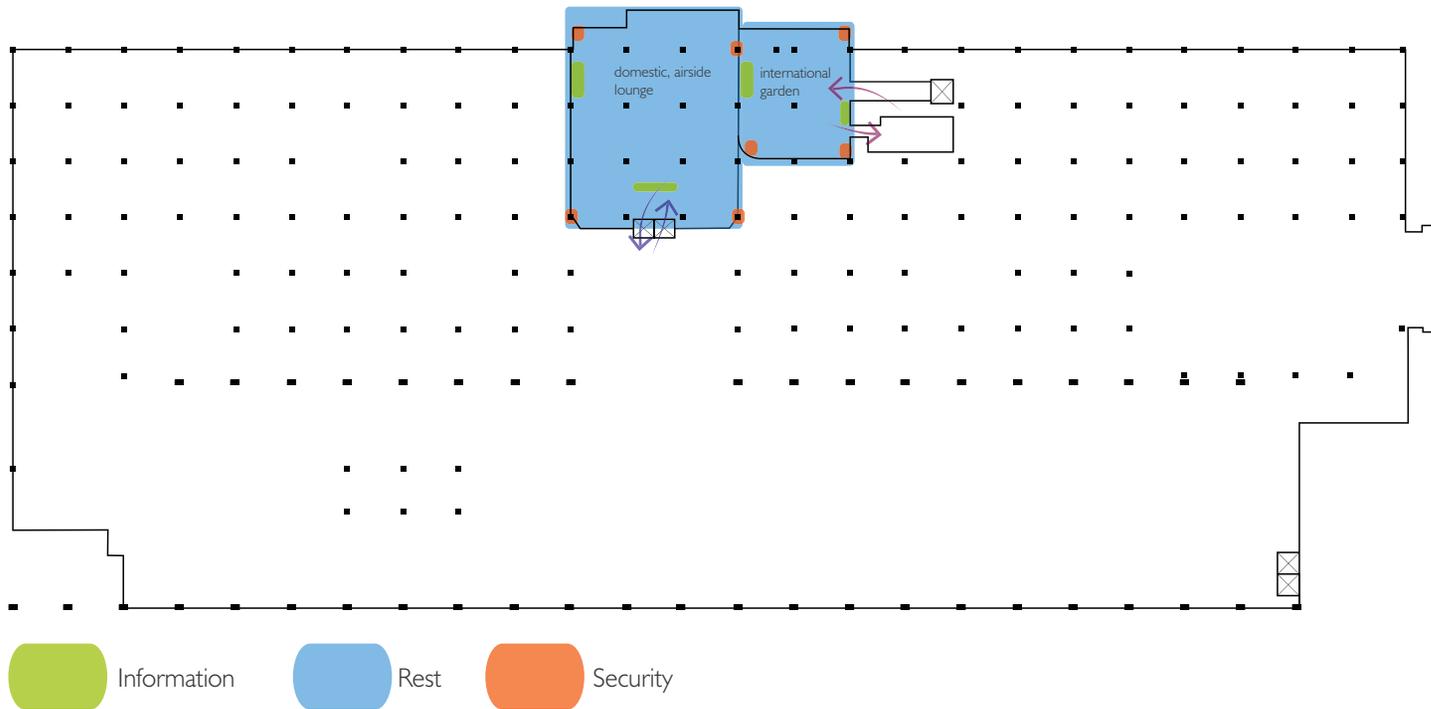


Figure 45. Diagram of Journey Through Airport (con't on page 135-136)





Final Proposed Design

Exterior View

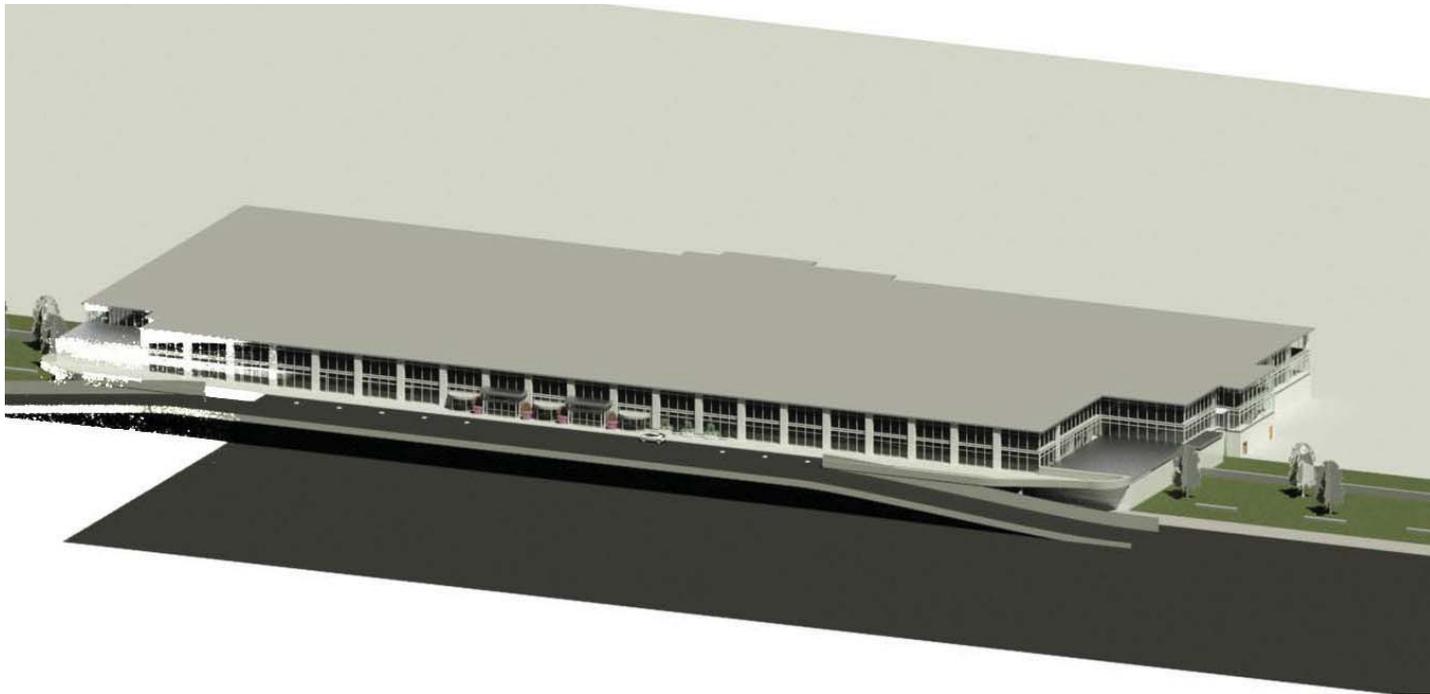


Figure 46. Exterior Building, Axonometric View

Main Level

Level 1: Floorplan



Figure 47. Level 1, Floorplan

Level 1: Axonometric View

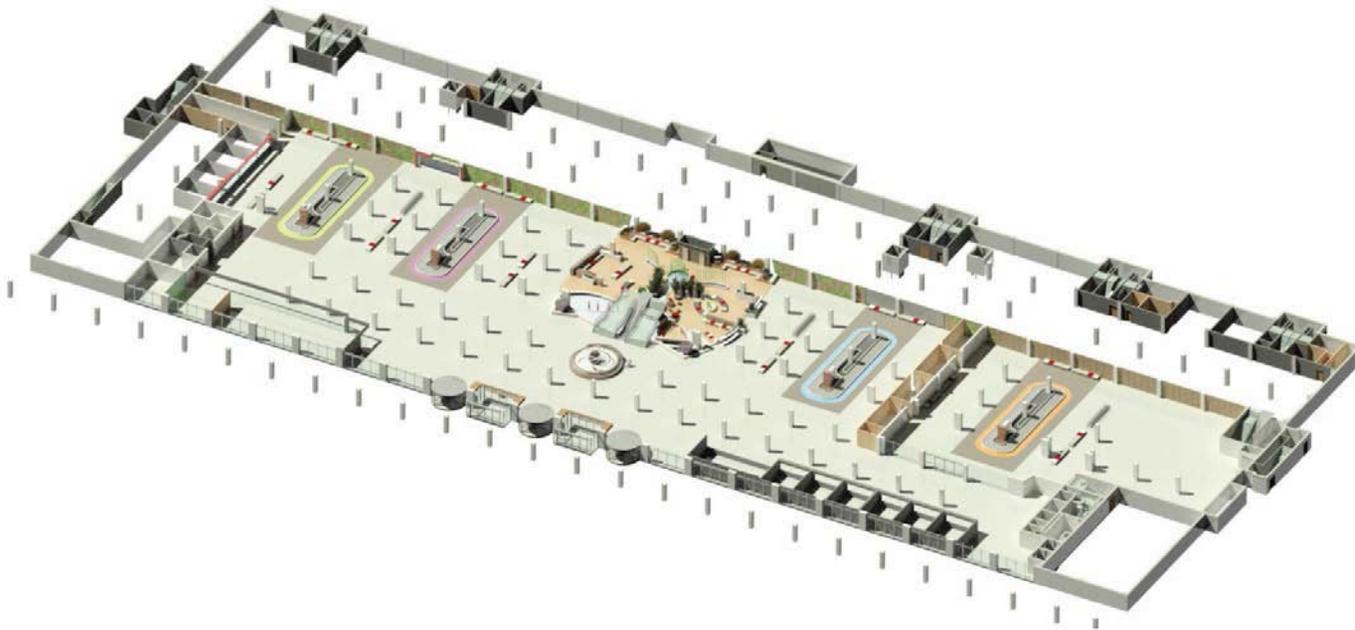


Figure 48. Level 1, Axonometric View

Second Level

Level 2: Floorplan

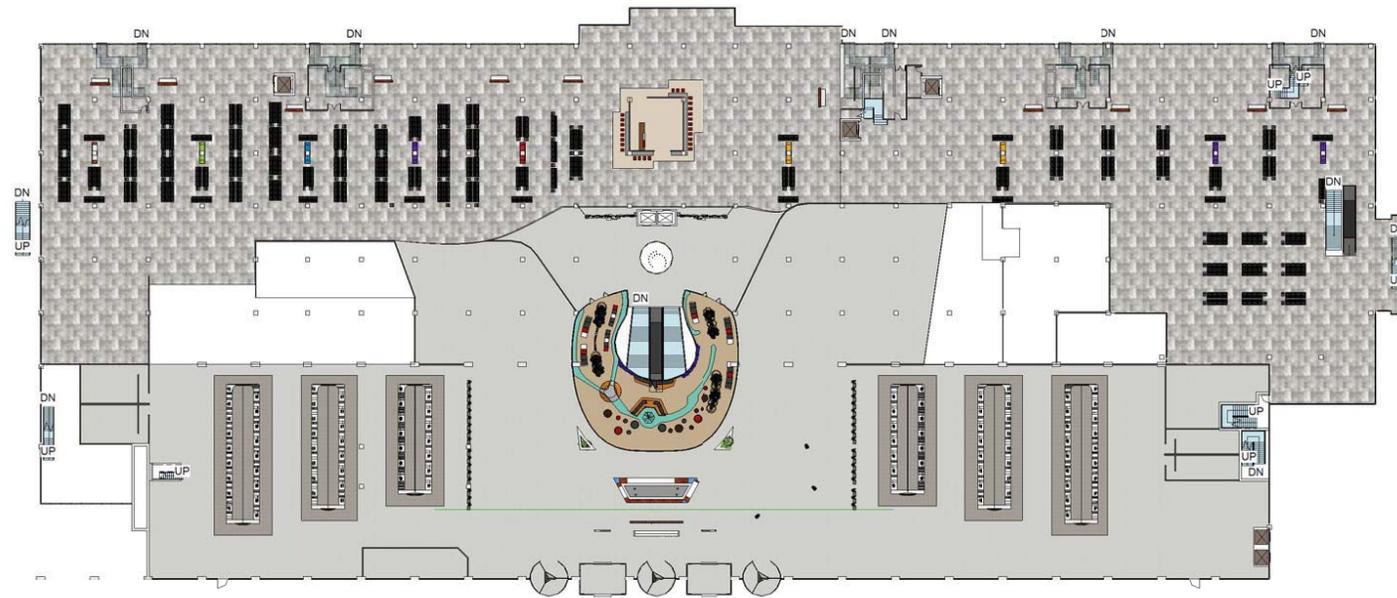


Figure 49. Level 2, Floorplan

Level 2: Axonometric View



Figure 50. Level 2, Axonometric View

Third Level

Level 3: Floorplan

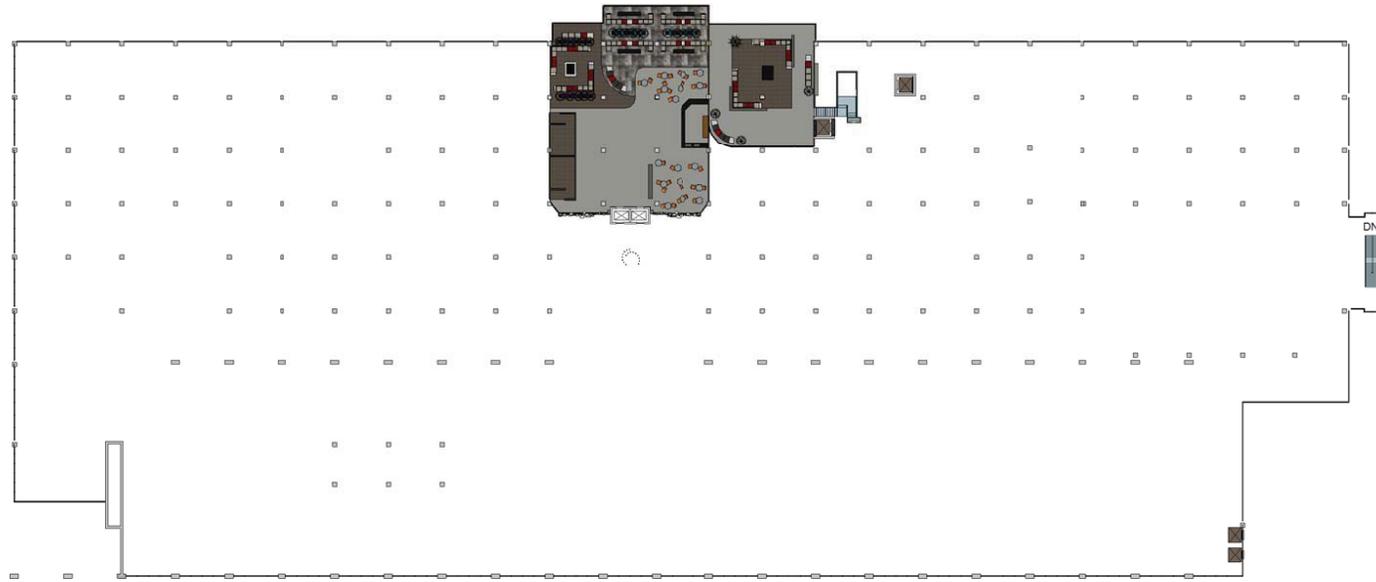


Figure 51. Level 3, Floorplan

Level 2: Axonometric View

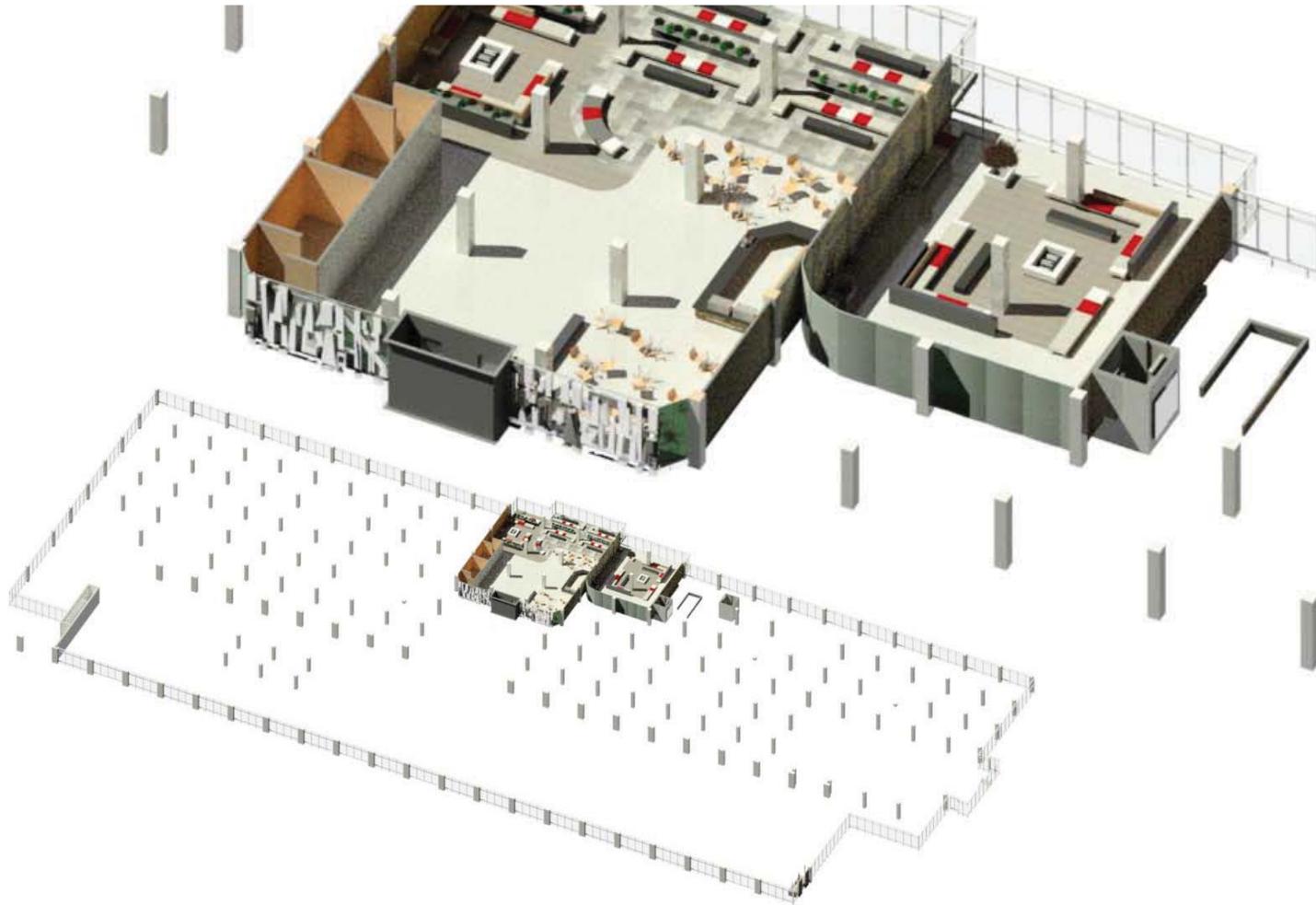


Figure 52. Level 2, Axonometric View, Close Up (top)

Figure 53. Level 2, Axonometric View (bottom)

Arriving at Airport Arrivals Gate



Figure 54. Arrivals Gate

View from Arrivals Central Staircase



Figure 55. Arrivals Staircase

Airline Services at Baggage Reclaim



Figure 56. Baggage Reclaim & Airline Services

Baggage Reclaim & Oversized Baggage

View in Lower Tranquility Garden



Figure 57. Baggage Reclaim & Oversized Baggage

View in Arrivals Tranquility Garden



Figure 58. Tranquility Garden, Arrivals Level

Water Feature in Tranquility Garden



Figure 59. Tranquility Garden, Water Feature

Departures Concourse Entrance



Figure 60. Departures Entrance

Departures Concourse, West Wall



Figure 61. Departures Concourse

Departures Concourse, East Wall



Figure 62. Departures Concourse, Opposite View

Check-in Counters

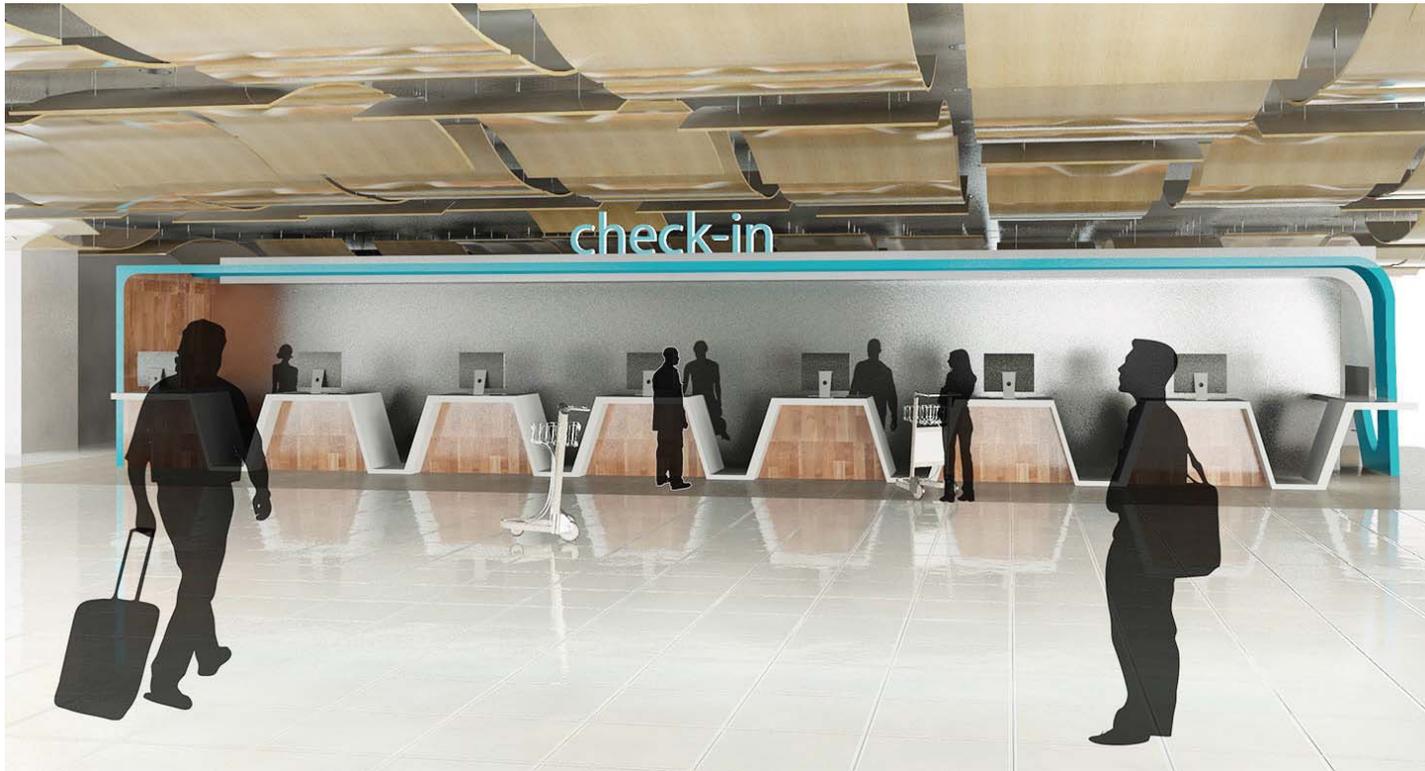


Figure 63. Check-in Counters

View into Departures Lounge & Gates

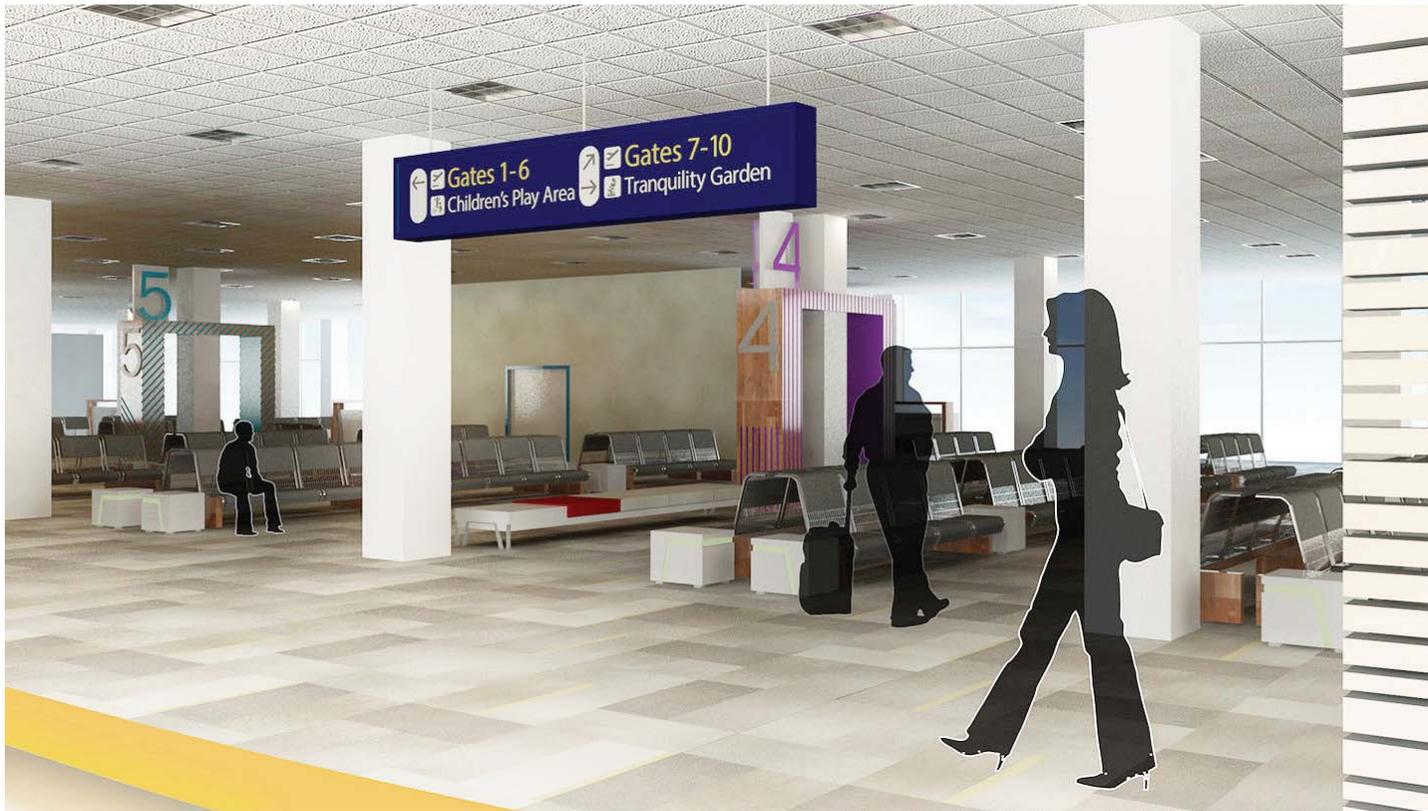


Figure 64. Departures Lounge & Gates

Entrance into Departures Tranquility Garden



Figure 65. Departures Tranquility Garden, Entrance

Departures Tranquility Garden



Figure 66. Departures Tranquility Garden

Tranquility Garden, Exit



Figure 67. Tranquility Garden, Exit

International Garden, Entrance



Figure 68. International Garden, Entrance

International Garden, West Wall



Figure 69. International Garden, West Wall

International Garden, East Wall



Figure 70. International Garden, East Wall

Airside Lounge, East Wall



Figure 71. Airside Lounge, East Wall

Airside Lounge, West Wall



Figure 72. Airside Lounge, West Wall

Summary

The conceptual design of the Winnipeg Airport that I have proposed, my hope and intention was to create a facility that would once again celebrate the excitement of air travel. The spaces within are brightly lit with wide corridors and use of vibrant colours that indicate areas of importance, like the check-in counters, areas of rest, and the departure gates. All entrances and exits are staffed with customer service and security personnel and to provide assistance as needed. The presence of airport staff will reduce the fear of unfamiliar environments, especially for the elderly travellers. In addition, surveillance cameras will be placed in strategic areas for added security measures. All transitional spaces integrate seamlessly with the surrounding elements, using local art and artifacts to gently guide travellers along the path of travel. Ensuring that the interior is maintained on a continual basis will create a comfortable and clean environment that will encourage a positive emotional experience.

The design process began with the analysis of the existing function of the old Winnipeg Airport. The facility was evaluated to understand its historical significance in the city of Winnipeg and the province of Manitoba. Following this was a site analysis to determine the condition of the building and its surrounding site that would inform which architectural elements would remain or demolished. To better suite the users defined for this project, minor changes were made to the south side. To create connections to nature and emphasize the importance of nature and daylight on the human body, the east and west wall were replaced with curtain walls. The existing north wall facing the tarmac, although already using windows underwent changes to include floor to ceiling curtain walls that would run from the east side to the west side and extend from the main second level to the third level. These changes to the building brings about a sleek modernist aesthetic to the Airport and affirms its position in Winnipeg as a 21st century modern structure.

The overall design aesthetic for the Winnipeg Airport was to create an open plan that accommodates flows and pauses throughout the space. All of the spaces in the airport underwent this approach, including the central Tranquility Garden. I have also ensured that passengers are exposed to views to the outside at every angle and have the opportunity to connect all aspects of nature with the transitional space they occupy. In a highly public space, elements that encourage a sense of privacy help ease the emotional state of travellers and make them feel safe and comfortable in a high security environment.

Inspiration for my practicum project came about from an observational standpoint as well as personal experience. Observing fellow passengers in airports and watching how individuals or groups of people cope with the anxiety of air travel manifests in many different ways. In many cases, I noticed impatience, noticeable anxiety in the way people communicated to one another or other simple gestures that were tell-tale signs of stress. It seemed to me that the benefits of air travel had its downfalls as well. We as travellers were willing to undergo stressful environments so we could get from point A to point B quicker. But to take in these benefits, we had to subject ourselves to the scrutiny of surveillance, and finding space that offered us privacy and realizing that the airport environment was one that we were not truly comfortable in. I began to question the experience of air travel, and in the 21st century I came to the understanding that it wasn't really place but a transitional space that we were stuck in until we were able to depart. Wasn't air travel a celebrated experience in the past? How could air travel once again be an experience that we all enjoy, feel comfortable and safe in, yet able to function to the needs and requirements of a modern day airport and still place design sensitivity to the continually aging society?

The results of this practicum project are based upon theoretical research and draws from the positives and negatives of the precedents analyzed. The design and spatial planning of my proposed airport strives to set a precedent that accommodates the fact that the elderly are a population that is continually growing, and that people in this decade are now living longer than ever before. The investigation of surveillance theory informed the perception of security among the elderly and sought to understand their acceptance of technology with regard to safety. It also functioned as an important role in deciding the materiality and architectural forms that the design of the airport would incorporate. The theory of place and space helped build the foundation of connecting the body to the occupied space. It investigated how narrative through landscape and typographical elements could foster memory-building experiences and recall past memories that would strengthen the connection between the airport environment and the body. Lastly, investigating the ecology of aging helped me understand the needs and requirements of the elderly traveller. It brought up factors that would affect their decision making process, which could affect their decisions to travel. It became apparent that the navigating a foreign environment would have to intuitive to the human mind and body while triggering memories and creating new experiences would create a sense of identity and allow a relationship to develop.

The precedents helped create a starting point by investigating various existing typologies to understand the user group it was intended for. Through this analysis, a list of what was successfully implemented and which part of their design programme was less successful was formed as a means to inform my design process. The final design of the Winnipeg Airport addresses these issues and creates an interior environment in which travellers can feel at ease in, acknowledge their surroundings, and create new experiences and memories, and it encourages exploration as they meander throughout the airport terminal.

My proposed design for the Winnipeg Airport examines the possibility of retrofitting an old structure to fulfill the requirements of safety and security and to address the needs of the modern day traveller. This application of retrofitting could benefit other airport facilities that are similar in size and where there is not another site available that fits into the parameters required in constructing a new facility. Other constraints where retrofitting would be considered beneficial or the best approach include economic feasibility, time, and budget constraints. Specific to the old Winnipeg Airport Terminal building, though the modernist structure was in disarray both on the interior and exterior, it had potential to become a facility that reminds us of its history and

evolution from a simple airfield to the building it is now. The journey of retrofitting this existing building for my project was not without its challenges. It was my intent that the exterior façade and structural elements remain unaltered if possible. Another challenge involved understanding the small size of the airport and working within these constraints to create spaces that enhances the travelling experience. However, the final design required the modification of some of these elements. The exterior façade on the south side saw the consolidation of entrances and exits to a central area and several structural columns in the center were removed and its weight distributed to other surrounding structural elements. These changes allowed the interior space to open up, and create a central feature that is fundamental to the airport terminal. This central feature is the life of the airport design; it is the area that welcomes all arriving and departing travellers, employees, and airline staff. In addition, it also serves as a communal space that has the ability to calm the stressed traveller visually and through physical interaction with the space. Understanding the importance of nature, culture, and history was an important aspect in the design process. It informed the design aesthetic, materiality, and inclusion of elements in the interior space. However, further development of the airport terminal would be beneficial to the airport design.

Taking a step further, the airport would benefit if it reached out to become a fully sustainable airport where energy could derive from solar or harness wind to operate its lighting controls. The airport could also be adapted to use gray water collected on the roof. The surrounding landscape around the airport terminal building could explore the integration of a running path or bike trail, as was implemented at the Victoria International Airport in British Columbia. Other sustainable design considerations could manage water, lighting, and thermal systems to reach optimal levels of performance and ensure energy efficiency. Implementing these elements of sustainable design would benefit both the environment and community, showcasing the airport and Winnipeg as a community that embraces the importance of sustainable design.

However, in order to fully evaluate the successfulness of the final design, the proposed airport would have to be constructed and undergo a post-occupancy evaluation to truly understand if the theories investigated supports the design of the airport.

APPENDIX I: Building Code Analysis

Building Height: 37'-10"

Building Area: 140,684 sq.ft.

3.1.2.1. Classification of Buildings

The major occupancy of this building is *Group A, Division 2*. The WAA, Winnipeg Airport Authority will control all operations of the airport. All retail stores will be operated independently - *Group E*. All restaurant and licensed beverage establishments are classified as *Group A, Division 2*.

3.1.4.3. Wire and Cables

Except as required by Sentence (2), optical fibre cables and electrical wires and cables with combustible insulation, jackets, or sheathes that are install in a building permitted to be combustible construction shall

(a) not convey flam or continue to burn for more than 1 min when tested in a conformance with the Vertical Flame Test in Clause 4.11.1 of CSA C22.2 No. 03. "Test Methods for Electrical Wires and Cables," (FTI rating), or

(b) be located in:

- i) totally enclosed noncombustible raceways
- ii) masonry walls,
- iii) concrete slabs, or
- iv) totally enclose in non-metallic raceways conforming to Clause 3.1.5.20.(1)(b)

3.1.5.2 Minor Combustible Components

Minor combustible components are permitted in a building required to be of non-combustible construction.

3.1.5.4. Combustible Glazing and Skylights

Combustible skylight assemblies are permitted in a building required to be of noncombustible construction if the assemblies have a flame-spread rating not more than 75 provided the assemblies

- i) have an individual area not more than 27 m²
- ii) have an aggregate horizontal projected area of the openings through the ceiling not more than 33% of the area of the ceiling of the room or space in which they are located,

iii) are spaced not less than 1.2m from adjacent assemblies and from required fire separations.

3.1.5.7. Combustible Millwork

Combustible millwork, including interior trim, doors and door frames, show windows together with their frames, aprons and backing, handrails, shelves, cabinets and counters, is permitted in a building required to be of noncombustible construction.

3.1.5.10. Combustible Interior Finishes

(1) Combustible interior finishes, including paint, wallpaper, and other interior finishes not more than 1mm thick, are permitted in a building required to be of noncombustible construction.

(2) Combustible interior wall finishes, other than foamed plastics, are permitted in a building required to be of noncombustible construction provided they

(a) are not more than 25mm thick, and

(b) have a flame-spread rating not more than 150 on any exposed surface, or any surface that would be exposed by cutting through the material in any direction

3.1.7.3. Exposure Conditions for Rating

Floor, roof, and ceiling assemblies shall be rated for exposure to fire on the underside.

Firewalls and interior vertical fire separations shall be rated for exposure to fire on each side.

3.1.8.10. Twenty-Minute Closures

Doors in required fire-separations are permitted to have 20 min fire protection rating.

3.1.8.11. Self-Closing Devices

Every door in a fire separation shall be equipped with a self-closing device designed to return the door to the closed position after each use.

3.1.8.13. Door Latches

Swing type doors in a fire separation shall be equipped with a positive latching mechanism designed to hold the door in the closed position after each use.

3.1.10.1. Firewalls

The connections and supports for structural framing members that are connected to or supported on a firewall and shall have a fire resistance rating less than that required for the firewall, shall be designed so that the failure of the framing systems during a fire will not affect the integrity of the firewall during the fire.

A firewall shall extend from the ground continuously through, or adjacent to all storey's of a building or buildings so separated, except that a firewall located above a basement storage garage.

3.1.13.2. Flame-Spread Rating

Flame-spread rating of interior wall and ceiling finishes, including glazing and skylights, shall be not more than 150.

3.1.13.6. Corridors

- (1) Flame-spread rating shall not be more than 75 for the interior wall finish of
- (a) a public corridor
 - (b) a corridor used by the public in an assembly occupancy or

- (2) The flame-spread rating limit specified in Sentence (1) does not apply to corridors referred to in Sentence (1) provided the flame-spread rating is not more than
- (a) 25 on the upper half of the wall, and
 - (b) 150 on the lower half of the wall

The flame-spread rating limits specified in Sentences (1) and (2) for corridors referred to in Sentence (1) does not apply to a corridor in which the flame-spread rating is not more than 150 provided the building is sprinklered throughout

3.1.13.10. Exterior Exit Passageways

The wall and ceiling finishes of an exterior exit passageways that provides the only mean of egress from the rooms or suites it serves, including the soffit beneath and the guard on the passageway, shall have a flame-spread rating not more than 25, except that a flame-spread rating not more than 150 is permitted for up to 10% of the total wall area and for up to 10% of the total ceiling area.

3.1.16. Occupant Load

Main (Arrivals):

Arrivals Concourse	77, 829 sq. ft / 10.2	=	7, 630 people
Restaurant + Retail	3, 266 sq. ft / 12.9	=	253 people
Services	9, 701 sq. ft / 39.8	=	244 people
Garden	7,955 sq. ft / 19.9	=	400 people

Second (Departure):

Departures Concourse	49, 054 sq. ft / 10.2	=	4, 809 people
Security Checkpoint	8, 544 sq. ft / 10.2	=	838 people
Restaurant + Retail	10, 154 sq. ft / 12.9	=	787 people
Garden	3, 797 sq. ft / 19.9	=	191 people

Departures Lounge	66, 294 sq. ft / 8.1	=	8184 people
Play Area	2, 858 sq. ft / 100	=	2, 858 people
Third:			
Seniors Lounge	7, 052 sq. ft/ 19.9	=	355 people
Total Building Load		=	23, 720 people

3.2.2.4. Buildings with Multiple Major Occupancies

If a building contains more than one major occupancy, classified in more than one Group or Divisions, the requirements of this Subsection concerning building size and construction relative to major occupancy shall apply to Articles 3.2.2.5. to 3.2.2.8.

3.2.2.5. Applicable Building Height and Area

In determining the fire safety requirements of a building in relation to each of the major occupancies contained therein, the building height and building area of the entire building shall be used.

3.2.2.6. Multiple Major Occupancies

In a building containing more than one major occupancy, the requirements of this Subsection for the most restricted major occupancy contained shall apply to the whole building.

3.2.2.7. Superimposed Major Occupancies

(1) In a building in which one major occupancy is located entirely above another major occupancy, the requirements in this Subsection for each portion of the building containing a major occupancy shall apply to that portion as if the entire building was of that major occupancy.

(2) If one major occupancy is located above another major occupancy, the fire-resistance rating of the floor assembly between the major occupancies shall be determined on the basis of the requirements of this Subsection for the lower major occupancy.

3.2.2.8. Exceptions for Major Occupancies

In a building which the aggregate area of all major occupancies in a particular Group or Division is not more than 10% of the floor area of the storey in which they are located, these major occupancies need not be considered as major occupancies for the purposes of the Subsection, provided they are not classified as Group F, Division 1 or 2 occupancies.

3.2.2.10. Streets

The building faces one street – Wellington Ave

3.2.2.15. Storeys below Ground

Levels that does not extend more than one storey below the ground level must have minimum precautions against fire spread and collapse the same as basements under a building of one storey in building height having the same occupancy and building area.

3.2.2.23. Group A, Division 2, up to 6 Storeys, Any Area, Sprinklered

- (1) A building classified as Group A, Division 2, that is not limited by building area is permitted to conform to Sentence (2) provided
 - (a) the building is sprinklered throughout, and
 - (b) it is not more than 6 storeys in building height
- (2) The building referred to in sentence (1) shall be of noncombustible construction, and
 - (a) floor assemblies shall be fire separation with a fire-resistance rating not less than 1 h,
 - (b) mezzanines shall have a fire-resistance rating not less than 1 h, and
 - (c) loadbearing walls, columns, and arches shall have a fire-resistance rating not less than that required for the supported assembly.

3.2.2.65. Group E, up to 3 Storeys, Sprinklered

- (1) A building classified as Group E is permitted to conform to Sentence (2) provided
 - (a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18.(2)
 - (b) it is not more than 3 storeys in building height, and
 - (c) it has a building area not more than
 - i) 7 200 m² if 1 storey in building height,
 - ii) 3 6000 m² if 2 storeys in building height, or
 - iii) 2 400 m² if 3 storeys in building height
- (2) The building referred to in Sentence (1) is permitted to be of combustible construction or noncombustible construction used singly or in combination, and
 - (a) floor assemblies shall be fire separations with a fire-resistance rating not less than 45 min,
 - (b) mezzanines shall have, if of combustible construction, a fire-resistance rating not less than 45 min,
 - (c) loadbearing wall, columns and arches supporting an assembly required to have a fire-resistance rating shall
 - i) have a fire-resistance rating not less than 45min, or
 - ii) be of noncombustible construction, and
 - (d) loadbearing walls, columns and arches supporting a fire reparation shall have a fire-resistance rating not less than that required for the fire separation

3.2.3.18. Covered Vehicular Passageway

- (1) A covered vehicular passageway designed as a receiving or shipping area shall be separated from every building or part of a building adjoining if by a fire separation having a fire-resistance rating not less than 1.5 h.

(2) A covered vehicular passageway constructed below grade shall be of noncombustible construction.

3.2.3.19. Walkway between Buildings

If buildings are connected by a walkway, each building shall be separated from the walkway by a fire separation with a fire-resistance rating not less than 45min.

A walkway of non combustible construction used only as a pedestrian thoroughfare need not conform to the requirements of Articles 3.2.3.14. and 3.2.3.15.

A walkway between buildings shall not be more than 9 m wide.

3.2.4.1. Determination of Requirement for a Fire Alarm System

A firm alarm system shall be installed in buildings in which an automatic sprinkler system is installed

3.2.4.10 Electrical Supervision

Electrical supervision shall be provided for the fire alarm system

Indication of a supervisory signal shall be transmitted to the fire department

3.2.4.11 Fire Detectors

Fire detectors shall be connected to the fire alarm system.

Fire detectors shall be installed in the following spaces:

- (a) storage rooms not within dwelling units
- (b) service rooms not within dwelling units
- (c) janitor's rooms,
- (d) rooms in which hazardous substances are to be used or stored
- (e) elevator hoistways

3.2.4.12. Smoke Detectors

Smoke detectors shall be installed in each sleeping room, each public corridor in portions of a building.

3.2.4.19. Audibility of Alarm Systems

Audible signal devices forming part of a alarm system shall be installed in a building so that

- (a) alarm signals are clearly audible throughout the floor area, and
- (b) alert signals are clearly audible in continuously staffed locations, and where there are no continuously staffed locations, throughout the floor area

3.2.4.21. Smoke Alarms

At least one smoke alarm shall be installed on each storey of a dwelling unit.
The smoke alarm shall be installed on or near the ceiling.

3.2.5.16. Portable Fire Extinguishers

Portable fire extinguishers shall be provided and installed in accordance with

- (a) provincial, territorial regulations or municipal bylaws, or
- (b) the National Fire Code of Canada.

3.2.7.2. Recessed Lighting Fixtures

A recessed lighting fixture shall not be located in an insulated ceiling unless the fixture is designed for this type of installation

3.2.7.3. Emergency Lighting

Emergency lighting shall be provided to an average level of illumination not less than 10 lx at floor or tread level in

- (a) exits,
- (b) principle routes providing access to exit in open floor areas and in service rooms,
- (c) corridors used by the public,
- (d) corridors serving classrooms,
- (e) floor areas or parts thereof where the public may congregate having an occupant load of 60 or more

3.2.7.4. Emergency Power for Lighting

Emergency power supply shall be provided

- (a) to maintain the emergency lighting by a power source such as batteries or generators that will continue to supply power in the event that the regular power supply to the building is interrupted.
- (b) so designed and installed that upon failure of regular power it will assume the electrical load automatically for a period of 2 h.

3.2.8.4. Sprinklers

A building containing an interconnected floor space shall be sprinklered throughout.

3.3.1.3. Means of Egress

- (1) Access to exit within floor areas shall conform to assembly spaces and industrial occupancies, in addition to the requirements of this subsection.
- (2) If a podium, terrace, platform or contained open space is provided, egress requirements shall conform to the appropriate requirements for rooms and suites.

- (3) Means of egress shall be provided from every roof which is intended for occupancy, and from every podium, terrace, platform or contained open space.
- (4) Two points of egress shall be provided for a service space if the area of more than 200m² or the travel distance measured from any point in the service space to a point of egress is more than 25m.
- (5) At the point where a doorway opens onto a public corridor or exterior passageway, it shall be possible to go in opposite directions to each of the 2 separate exits

3.3.1.4. Public Corridor Separations

The fire-resistance rating of a fire separation between a public corridor and the remainder of a floor area is permitted to be less than 1 h but not less than 45 min.

If a storey is sprinklered throughout, no fire-resistance rating is required for a fire separation between a public corridor and the remainder of the storey, provided the corridor does not serve a care, treatment or detention occupancy or a residential occupancy.

3.3.1.5 Egress Doorways

Except for dwelling units, a minimum of 2 egress doorways located so that one doorway could provide egress from the room or suite if the other doorways become inaccessible to the occupants due to a fire which originates in the room or suite, shall be provided for every room and every suite

- (a) intended for an occupant load more than 60
- (b) in a floor area that is sprinklered throughout and does not contain a high hazard industrial occupancy and
 - i) the travel distance to a egress doorway is more than 25m
 - ii) the area of the room or suite is more than 200m²

Where 2 egress doorways are required, they shall be placed at a distance from one another equal to or greater than one third of the maximum overall diagonal dimension of the area to be served, measured as the shortest distance that smoke would have to travel between the nearest required egress doors.

3.3.1.6. Travel Distance

The maximum travel distance within the room or suite to the nearest egress doorway shall not exceed 15m.

3.3.1.9. Corridors

The minimum width of a public corridor shall be 1100mm.

3.3.1.11. Door Swing

- (1) A Door that opens into a corridor or other facility providing access to exit from a room or suite that is used or intended for an occupant load more than 60 or a high-hazard industrial occupancy shall swing in the direction of travel to the exit
- (2) Every door that divides a corridor that is not wholly contained within a suite shall swing on a vertical axis in the direction of travel to the exit.
- (3) If a pair of doors is installed in a corridor that provides access to exit in both directions, the doors shall swing in opposite directions, with the door on the right hand side swinging in direction of travel to the exit.

3.3.1.13. Doors and Door Hardware

All doors that open into or is located within a public corridor shall provide a minimum clear opening of 800mm and not open onto a step.

3.3.1.14. Ramps and Stairways

- (1) Ramps and stairways that do not serve as exits shall conform to the dimensional, guard, handrail and slip-resistance requirements for exit ramps and stairways.
- (2) Ramps and stairways that do not conform to the requirements of Sentence (1) are permitted to serve service rooms and service spaces and in industrial occupancies, provided the ramps and stairways are intended only for occasional use for servicing equipment and machinery.

3.3.1.16. Curved or Spiral Stairs

A curved or spiral stair is permitted in a stairway not required as an exit, provided the stair has

- (a) treads with
 - i) a minimum run not less than 150 mm, and
 - ii) an average run not less than 200 mm, and
- (b) risers in conformance with Sentence 3.4.6.8.(2).

3.3.1.17. Capacity of Access to Exits

- (1) The capacity of an access to exit shall be based on the occupant load of the portion of the floor area served.
- (2) In an access to exit the required width ramps with a slope not more than 1 in 8, doorways, and corridors shall be based on not less than 6.1 mm per person
- (3) In an access to exit required width of a ramp with a slope more than 1 in 8 shall be based on not less than 9.2 mm per person.
- (4) The capacity of stairs in an access to exit shall conform to the requirements for the stairs in Sentences 3.4.3.2.(1) to (3).

3.3.2.14. Risers for Stairs

In a Group a, Division 2 occupancy used for the serving of food and beverages, an interior flight of stairs with fewer than 3 risers is permitted provided it

- (a) is not less than 900 mm wide
- (b) is illuminated at all times that occupants are on the premises, and
- (c) has a handrail on each side

3.4.1.4. Types of Exits

An exit from any floor area shall be one of the following, used singly or in combination:

- (a) an exterior doorway
- (b) an exterior passageway
- (c) an exterior ramp
- (d) an exterior stairway
- (e) a horizontal exit
- (f) an interior passageway
- (g) an interior ramp, or
- (h) an interior stairway

3.4.1.5. Exterior Exit Passageways

Access to an exterior exit passageway from a floor area shall be through exit doors at the floor level.

3.4.1.8. Transparent Doors and Panels

Glass and transparent panels in an exit shall conform to the appropriate requirements for glass and transparent panels in an access to exit.

3.4.2.1. Minimum Number of Exits

Every floor area intended for occupancy shall be served by at least 2 exits.

3.4.2.2. Means of Egress from Mezzanines

- (1) The space above a mezzanine shall be served by means of egress leading to exits accessible at the mezzanine level on the same basis as floor areas.
- (2) The means of egress from a mezzanine need not conform, provided
 - (a) the occupant load of the mezzanine is not more than 60
 - (b) the area of the mezzanine does not exceed the area limits of 150m²,

(c) the distance limited of 15m, measured along the path of travel are not exceeded from any point on the mezzanine to an egress door or egress stairway.

3.4.2.3. Distance between Exits

- (1) The least distance between 2 exits from a floor area shall be one half the maximum diagonal dimension of the floor area, but need not be more than 9m for a floor area having a public corridor.
- (2) The minimum distance between exits shall be the shortest distance that smoke would have to travel between the exits, assuming that the smoke will not penetrate an intervening fire separation.

3.4.2.4. Travel Distance

- (1) Travel distance means the distance from any point in the floor area to an exit measured along the path of travel to the exit.
- (2) Travel distance from a suite or a room not within a suite is permitted to be measured from an egress door of the suite or room to the nearest exit, provided
 - (a) the suite or room is separated from the remainder of the floor area by a fire separation
 - i) having a fire-resistance rating not less than 45 min in a floor area that is not sprinklered throughout, or
 - ii) which is not required to have a fire-resistance rating, in a floor area that is sprinklered throughout, and
 - (b) the egress doors open onto
 - i) an exterior passageway
 - ii) a corridor used by the public that is separated from the remainder of the floor area
 - iii) a public corridor that is separated from the remainder of the floor area
- (3) Travel distance to an exit shall be not more than 50 m from any point in a service space.

3.4.2.5. Location of Exits

Exits shall be located so that the travel distance to at least one exit shall be not more than 45m in a floor area.

Exits shall be located and arranged so that they are clearly visible or their locations are clearly indicated and they are accessible at all times.

3.4.3.2. Exit Width

The required width of an exit shall not be less than 1,100 for corridors, passageways, stairs, and ramps.

3.4.4.2. Exits through Lobbies

- (1) No exit from a floor area above or below the first storey shall lead through a lobby.
- (2) Not more than one exit from a floor area is permitted to lead through a lobby, provided
 - (a) the lobby floor is not more than 4.5 m above grade,
 - (b) the path of travel through the lobby to the outdoors is not more than 15 m,

- (c) the adjacent rooms or premises having direct access to the lobby do not contain a care, residential, or industrial occupancy
- (d) the lobby is not located within an interconnected floor space
- (e) the lobby conforms to the requirements for exits, except that
 - i) rooms other than service rooms and storage rooms are permitted to open onto the lobby
 - ii) the fire separation between the lobby and a room used for the sole purpose of control and supervision of the building need not have a fire-resistance rating
 - iii) the fire separation between the lobby and adjacent occupancies that are permitted to open onto the lobby need not have a fire-resistance rating provided the lobby and adjacent occupancies are sprinklered, and
 - iv) passenger elevators are permitted to open onto the lobby, provided the elevator doors are designed to remain closed except while loading and unloading passengers

3.4.5.1. Exit Signs

- (1) Every exit door shall have an exit sign placed over or adjacent to it of the exit serves
 - (a) a building more than 2 storeys in building height
 - (b) a building having an occupant load of more than 150, or
- (2) Every exit sign shall
 - (a) be visible on approach to the exit
 - (b) conform to the dimensions indicated in ISO 7010, "Graphical symbols-Safety colours and safety signs - Safety signs used in workplaces and public areas"
- (3) Internally illuminated exit signs shall be continuously illuminated and
 - (a) where illumination of the sign is powered by an electrical circuit, be constructed in conformance with CSA C22.2 No. 141, "Emergency Lighting Equipment." or
 - (b) where illumination of the sign is not powered by an electrical circuit, be constructed in conformance with CAN/ULC-S572, "Photoluminescent and Self-Luminous Sign and Path Marking Systems."

3.4.6.1. Slip Resistance of Ramps and Stairs

- (1) The surfaces of ramps, landings and treads
 - (a) shall have a finish that is slip resistant, and
 - (b) if accessible to the public, shall have either a colour contrast or distinctive pattern to demarcate the leading edge of the tread and the leading edge of the landing, as well as the beginning and end of a ramp.
- (2) Treads and landings of exterior exit starts more than 10 m high shall be designed to be free of ice and snow accumulations.

3.4.6.2. Minimum Number of Risers

Every flight of interior stairs shall not have less than 3 risers.

3.4.6.3. Maximum Vertical Rise of Stair Flights and Required Landings

- (1) No flight of stairs shall have a vertical rise of more than 3.7 m between floors or landings, except that a flight of stairs serving as an exit in a Group B, Division 2 occupancy shall have a vertical rise not more than 2.4 m between floors or landings.
- (2) Except as provided in Sentence (3), a landing shall be provided
 - (a) at the top and bottom of each flight or interior and exterior stairs,
 - (b) at the top and bottom of every section of ramp,
 - (c) where a doorway opens onto a stair or ramp,
 - (d) where a ramp opens onto a stair, and
 - (e) where a stair opens onto a ramp.
- (3) A landing may be omitted at the bottom of an exterior stair or ramp, provided that is no gate, door or fixed obstruction within the lesser of
 - (a) the width of the stair or ramp, or
 - (b) 1 100 mm.

3.4.6.4. Dimensions of Landing

The length and width of a landing shall be at least the width of the stairway in which it occurs, except that in a straight run, the length of the landing need not be more than 1 100 mm.

3.4.6.5. Handrails

A stairway shall have a handrail on at least one side, but if it is 1 100 mm or more wide, it shall have handrails on both sides.

3.4.6.6. Guards

Every exit shall have a wall or a well-secured guard on each side

3.4.6.7. Ramp Slope

The maximum slope of a ramp shall be

- (a) 1 in 10 in any assembly, care, treatment, detention or residential occupancy,
- (b) 1 in 6 in rooms or floor areas classified as a mercantile or industrial occupancy,
- (c) 1 in 8 in any other floor area, and
- (d) 1 in 10 for an exterior ramp.

3.4.6.8. Treads and Risers

- (1) For fire escapes, steps for stairs shall have a run of not less than 280 mm between successive steps.

- (2) Except in fire escape stairs, tread measure as the horizontal nosing-to-nosing distance, shall have a uniform run with a maximum tolerance of
 - (a) 5 mm between adjacent treads
 - (b) 10 mm between the deepest and shallowest treads in a flight.
- (3) Treads and risers shall not differ significantly in run and rise in successive flights in any stair system
- (4) The slope of treads or landings shall not exceed 1 in 50.
- (5) The top of the nosing of stair treads shall have a rounded or bevelled edge extending not less than 6 mm and not more than 13 mm measured horizontally from the front of the nosing.
- (6) If resilient material is used to cover the nosing of a stair tread, the minimum rounded or bevelled edge required is permitted to be reduced to 3 mm.

3.4.6.11. Doors

- (1) The distance between a stair riser and the leading edge of a door during its swing will not be less than 300 mm.
- (2) No exit door shall open directly onto a step except that, if there is danger of blockage from ice or snow, an exit door is permitted to open onto not more than one step which shall not be more than 150 mm high.
- (3) Exit doors shall be clearly identifiable
- (4) No door leaf in an exit doorway with more than one leaf shall be less than 610 mm wide.

3.4.6.12. Direction of Door Swing

Except for doors serving a single dwelling unit shall open in the direction of exit travel and swing on its vertical axis.

3.4.6.13. Self-Closing Devices

Exit doors shall be provided with a self-closing mechanism and shall never be secured in an open position.

3.4.6.15. Revolving Doors

An electrically powered revolving door, if used,

- (a) the door leaves will collapse and stop automatic rotation of the door system and not obstruct the doorway if a force not more than that is applied at the center of a door leaf
- (b) the door leaves are capable of being opened from the inside of the building without requiring keys, special devices, or specialized knowledge of the door opening mechanism,
- (c) allowing exiting capacity is based on the clear width of passage through the door enclosure when the doors are fully collapsed,
- (d) a permanent sign, whose centreline is between 1 000 mm and 1 500 mm above the floor, is placed on each face of each door indicating the method of collapsing the door leaf in an emergency, and
- (e) glass used for door leaves and enclosure panels is safety glass.

3.4.6.16. Door Release Hardware

Every exit door shall be equipped with a latching mechanism, a device that will release the latch and allow the door to swing wide open.

3.5.4.1. Elevator Car Dimensions

- (1) If one or more elevators are provided in the building, all storeys shall be served by at least one elevator which has inside dimensions that will accommodate and provide adequate access for a patient stretcher 2 010mm long and 610 mm wide in the prone position.
- (2) An elevator satisfying the requirements of Sentence (1) shall be clearly identified on the main entrance level of the building.

3.6.4.4. Attic or Roof Spaces Access

An attic or roof space more than 600mm high shall be provided with access from the floor immediately below by a hatchway not less than 550mm by 900mm or by a stairway

3.6.4.5. Horizontal Service Space Access

A horizontal service space, consisting of ceiling and duct spaces, which is more than 1 200 mm wide and 600 mm wide shall have inspection doors not less than 300 mm in both horizontal and vertical dimensions placed so that the entire interior of the duct or space can be viewed.

3.7.2.2. Water Closets

- (1) Water closets shall be provided for each sex assuming that the occupant load is equally divided between males and females, unless the proportion of each sex expected in the building can be determined with reasonable accuracy.
- (2) The number of water closets required for a business and personal services company shall be 3 for over 50 number of persons of each sex, with 1 for each additional increment of 50 persons of each sex in excess of 50.
- (3) In a building whose floor area is more than 600 m² and that includes one or more individual tenant spaces for a business and personal occupancy or mercantile occupancy, water closets shall be located so that they are accessible to the public when the building is occupied.

3.8.1.2. Entrances

The existing main public entrance to the building will be barrier free.

A barrier-free path of travel will include lifts or elevators when there is a difference in level.

3.8.1.4. Access to Storeys Served by Escalators and Moving Walks

- (1) In a building in which an escalator or inclined moving walk provides access to any floor level above or below the entrance floor level, an interior barrier-free path of travel shall also be provided to that floor level.
- (2) The route from the escalator or inclined moving walk to the barrier-free path of travel that leads from floor to floor as required by Sentence (1) shall be clearly indicated by appropriate signs.

3.8.2.2. Access to Parking Areas

- (1) If exterior parking is provided, a barrier-free path of travel shall be provided between the exterior parking area and a barrier-free entrance.
- (2) If an exterior passenger loading zone is provided, it shall have
 - (a) an access aisle not less than 1 500 mm wide and 6 000 mm long adjacent and parallel to the vehicle pull-up space,
 - (b) a curb ramp, where there are curbs between the access aisle and the vehicle pull-up space, and
 - (c) a clear height of not less the 2 750 mm at the pull-up space and along the vehicle access and egress routes.

3.8.3.3. Doorways and Doors

Every doorway that is located in a barrier-free path of travel shall have a clear width not less than 800 mm when the doors are open.

3.8.3.4. Ramps

A ramp located in a barrier-free path of travel shall

- (a) have a clear width not less than 870 mm,
- (b) have a slope not more than 1 in 12.
- (c) have a level area not less than 1 200 mm long and at least the same width as the ramp
 - i) at intervals not more than 9 m along its length, and
 - ii) where there is an abrupt change in the direction of the ramp, and
- (d) be equipped with handrails and guards.

3.8.3.9. Water Closets

A water closet a for a person with physical disability shall

- (a) be equipped with a seat located at not less than 400 mm and not more than 4 60 mm above the floor
- (b) be equipped with hand-operated flushing controls that are easily accessible to a wheelchair user or be atomically operable,
- (c) be equipped with a seat lid or other back support, and
- (d) not have a spring-actuated seat.

3.8.3.14. Counters

- (1) Every counter more than 2 m long, at which the public is served, shall have at least one barrier-free section not less than 760 mm long centred over a knee space .
- (2) A barrier-free counter shall be not more than 865 mm above the floor.

3.8.3.15. Shelves or Counters for Telephones

- (1) If built-in shelves or counters are provided for public telephones, they shall be level and shall
 - (a) be not less than 305 mm deep, and
 - (b) have, for each telephone provided, a clear space not less than 250 mm wide having no obstruction within 250 mm above the surface.
- (2) The top surface of a section of the shelf or counter described in Sentence (1) serving at least one telephone shall be not more than 865 mm above the floor.
- (3) If a wall-hung telephone is provided above the shelf or counter section describe in Sentence (2), it shall be located so that the receiver and coin slot are not more than 1 200 mm above the floor.

3.8.3.16. Drinking Fountains

Drinking fountains in the gym will have at least one that is barrier free and shall have a spout located near the front of the unit and not more than 915 mm above the floor.

APPENDIX II: Room Finish Schedule

ROOM FINISH SCHEDULE									
ROOM NUMBER	ROOM NAME	FLOOR	WALLS				CEILING		NOTES
			NORTH	SOUTH	EAST	WEST	MATERIAL	FINISH	
LEVEL 1									
101	DEPARTURES CONCOURSE	CT-1	G-1	GLAZING/ PT-1	-	-	GYPBD	PT-1	ARMSTRONG ACOUSTICAL WAVES PANEL ON CEILING
101-A	BAGGAGE RECLAIM, WEST	CT-1/CT-2	G-1	GLAZING/ PT-1	-	PT-1/PT-3	GYPBD	PT-1	
101-B	OVERSIZED BAGGAGE	EXCONC	PT-1	PT-1	PT-1	PT-1	GYPBD	PT-1	
101-C	BAGGAGE RECLAIM, EAST	CT-1/CT-2	G-1	GLAZING/ PT-1	PT-1/PT-3	-	GYPBD	PT-1	
102	STORAGE	CONC	CONC	CONC	CONC	CONC	EXP	-	
103	STAIRS	CONC	PT-1	PT-1	PT-1	PT-1	-	-	
104	CUSTODIAL	CONC	CONC	CONC	CONC	CONC	EXP	-	
105	CUSTODIAL	CONC	CONC	CONC	CONC	CONC	EXP	-	
106	MAINTENANCE	CONC	CONC	CONC	CONC	CONC	EXP	-	
107	AIRLINE SERVICES	CT-1	PT-1	PT-1	-	PT-4	GYPBD	PT-1	PT-4 TO BE USED AS ACCENT ONLY
108	MALE W/C	CT-3	PT-1	WT-1/WT-2	PT-2	PT-5	GYPBD	PT-1	
109	FEMALE W/C	CT-3	WT-1/WT-2	PT-1	PT-2	PT-5	GYPBD	PT-1	
110	TRANQUILITY GARDEN	HW-1	-	-	-	-	SLWD	-	
111	FEMALE W/C	CT-3	WT-1	PT-5	WT-1/ WT-2	PT-1	GYPBD	PT-1	
112	FEMALE W/C	CT-3	PT-1	WT-1	PT-1	WT-1/ WT-2	GYPBD	PT-1	
113	MALE W/C	CT-3	PT-1	PT-5	WT-1/ WT-2	PT-1	GYPBD	PT-1	
114	MALE W/C	CT-3	PT-1	PT-5	PT-1	WT-1/ WT-2	GYPBD	PT-1	
115	STORAGE	CONC	CONC	CONC	CONC	CONC	EXP	PT-1	
116	INTERNATIONAL ARRIVALS	CT-1/CT-2	G-1	PT-1	PT-1	PT-1/ PT-3/PT-5	GYPBD	PT-1	
117	STAIRS	CONC	PT-1	PT-1	PT-1	PT-1	-	-	
118	STAIRS	CONC	PT-1	PT-1	PT-1	PT-1	-	-	
119	MAINTENANCE/ CUSTODIAL	CONC	CONC	CONC	CONC	CONC	EXP	-	
120/121	PRIVATE RETAIL SPACES	-	-	-	-	-	-	-	

ROOM FINISH SCHEDULE									
ROOM NUMBER	ROOM NAME	FLOOR	WALLS				CEILING		NOTES
			NORTH	SOUTH	EAST	WEST	MATERIAL	FINISH	
LEVEL 2									
201	ARRIVALS CONCOURSE	CT-1	-	GLAZING/ PT-1	-	-	GYPBD	PT-1	
201-A	CHECK-IN, WEST	CT-1/CT-2	CW-1/PT-1	GLAZING/ PT-1	-	PT-1/PT-3	GYPBD	PT-1	ARMSTRONG ACOUSTICAL WAVES PANEL ON CEILING
201-B	CHECK-IN, EAST	CT-1/CT-2	CW-1PT-1	GLAZING/ PT-1	PT-1	PT-1/PT-3	GYPBD	PT-1	ARMSTRONG ACOUSTICAL WAVES PANEL ON CEILING
202	STAIRS	CONC	PT-1	PT-1	PT-1	PT-1	EXP	-	
203	MAINTENANCE	CONC	CONC	CONC	CONC	CONC	EXP	-	
204	MALE W/C	CT-3	WT-1/WT-2	PT-1	PT-2	PT-5/WT-1	GYPBD	PT-1	
205	FEMALE W/C	CT-3	PT-1	WT-1/WT-2	PT-2	PT-5/WT-1	GYPBD	PT-1	
206	CHILDREN'S PLAY SPACE	R-1	-	PT-1	PT-1	PT-1	ACT-1	-	
207	PRIVATE RETAIL SPACES	-	-	-	-	-	-	-	
208	DEPARTURES LOUNGE/GATE	CPT-1A/ CPT-1B/ CPT-1C/ CPT-2	GLAZING/ PT-1	-	PT-1	GLAZING/ PT-1	ACT-1	-	
209	SECURITY AREA, DOMESTIC	CT-1	WW-1	PT-1	WW-2	PT-1/PT-5	ACT-1	-	
210	TRANQUILITY GARDEN	HW-1	CW-2	CW-2	CW-2	CW-2	SLWD	-	
211	INTERNATIONAL LOUNGE/GATE	CT-1	WW-1	PT-1	CW-1	WW-1	ACT-1	-	
212	PRIVATE RETAIL SPACES	-	-	-	-	-	-	-	
213	CHILDREN'S PLAY SPACE	R-1	-	PT-1	PT-1	PT-1	ACT-1	-	
214	STAIRS	CONC	CONC	CONC	CONC	CONC	-	-	
215	FEMALE W/C	CT-3	PT-1	WT-1/WT-2	PT-5/WT-1	PT-2	GYPBD	-	
216	MALE W/C	CT-3	WT-1/WT-2	PT-1	PT-5/WT-1	PT-2	GYPBD	-	
217	STAIRS	CONC	CONC	CONC	CONC	CONC	EXP	-	

ROOM FINISH SCHEDULE									
ROOM NUMBER	ROOM NAME	FLOOR	WALLS				CEILING		NOTES
			NORTH	SOUTH	EAST	WEST	MATERIAL	FINISH	
<i>LEVEL 3</i>									
301	AIRPORT OFFICES, PRIVATE	CPT-3	GLAZING/PT-1	GLAZING/PT-1	GLAZING/PT-1	GLAZING/PT-1	ACT-1	-	
302	AIRSIDE LOUNGE, LOBBY	CT-1	GLAZING/PT-1	CW-1	PT-1/PT-2/PT-4	PT-1/PT-2/WW-1	GYPBD	PT-1	
302-A	AIRSIDE LOUNGE	CT-2	GLAZING/PT-1	-	PT-1/PT-4	G-1	GYPBD	PT-1	
303	FEMALE W/C	CT-3	PT-2	PT-1	PT-1	WT-1/WT-2	GYPBD	PT-1	
304	MALE W/C	CT-3	PT-1	PT-2	PT-1	WT-1/WT-2	GYPBD	PT-1	
305	INTERNATIONAL GARDEN	CT-1/CT-2	GLAZING/PT-1	CW-1	PT-1	G-1	GYPBD	PT-1	

Table 7. Room Finish Schedule

Materials Legend

ACT-1	Acoustic Ceiling Tile
EXP	Exposed Surface
GYPBD	Gypsum Wallboard
SLWD	Slat Wood Ceiling

Finishes Legend

CONC	Concrete: Painted White
CPT-1A	Carpet Tile: Shaw Contract, 18X36 Collection, Fade Series Tile 59597, Colour 95761
CPT-1B	Carpet Tile: Shaw Contract, 18X36 Collection, Fade Series Tile 59597, Colour 95504
CPT-1C	Carpet Tile: Shaw Contract, 18X36 Collection, Fade Series Tile 59597, Colour 95106
CPT-2	Carpet Tile: Shaw Contract, 18X36 Collection, Colour Plank Tile 59595, Colour 95210
CPT-3	Carpet Tile: Shaw Contract, Essay of Clues Collection, Site Lines Tile 59550, Colour 38530
CT-1	Tile: Ames Tile & Stone, Aria Collection, Flow Series, White FLWW24
CT-2	Tile: Ames Tile & Stone, Aria Collection, Koshi Series, Concrete KOC1224
CT-3	Tile: Ames Tile & Stone, Novum Series, Slate NOV16S
CW-1	Curtain Wall: Typical
CW-2	Curtain Wall: Custom for Garden
G-1	Garden Plant Wall
HW-1	Hardwood Flooring: Armstrong, Performance Plus, Hickory, Colour ESP5230 Butternut
PT-1	Paint: Pratt & Lambert, Pro-White, Eggshell Finish, 33-4
PT-2	Paint: Pratt & Lambert, Orangebird, Eggshell Finish, 8-10
PT-3	Paint: Pratt & Lambert, Blue Glow, Eggshell Finish, 25-28
PT-4	Paint: Pratt & Lambert, Moss Green, Eggshell Finish, 16-29
PT-5	Paint: Pratt & Lambert, Diplomat Gray, Eggshell Finish, 33-21
R-1	Rubber Flooring: Barkman, Playtop Safer Surfacing, Various Colours
WT-1	Wall Tile: Ames Tile & Stone, Aria Collection, Concept S Series, Belgian Grey CNCBBM
WT-2	Wall Tile: Ames Tile & Stone, Aria Collection, Concept S Series, Nordic Stone CNCNM
WW-1	Wood Slat Wall: Maple, Natural, Satin Finish

APPENDIX III: Architectural Detailing

CHECK-IN COUNTER, TYPICAL:

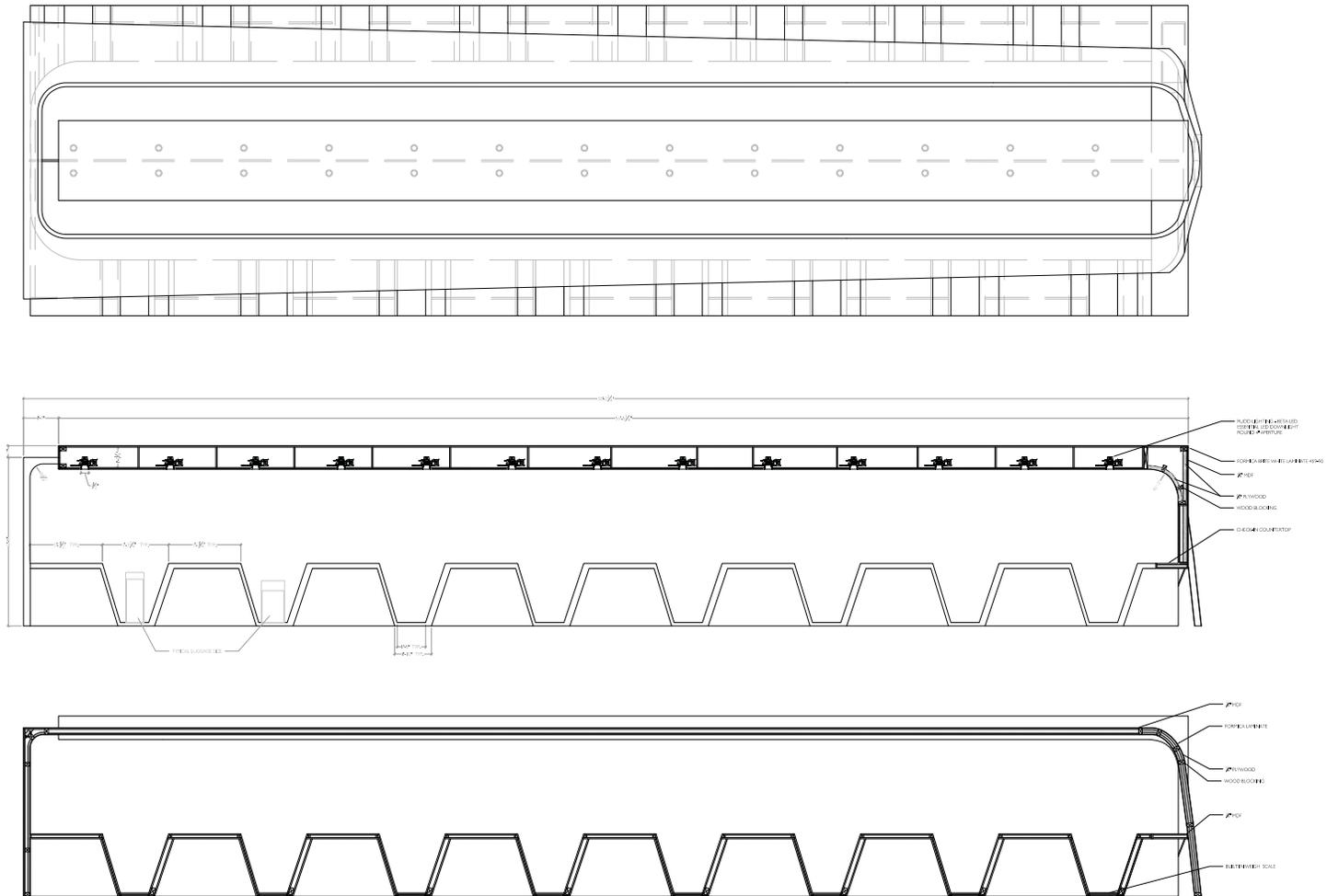


Figure 73. Check-in Counter Detail

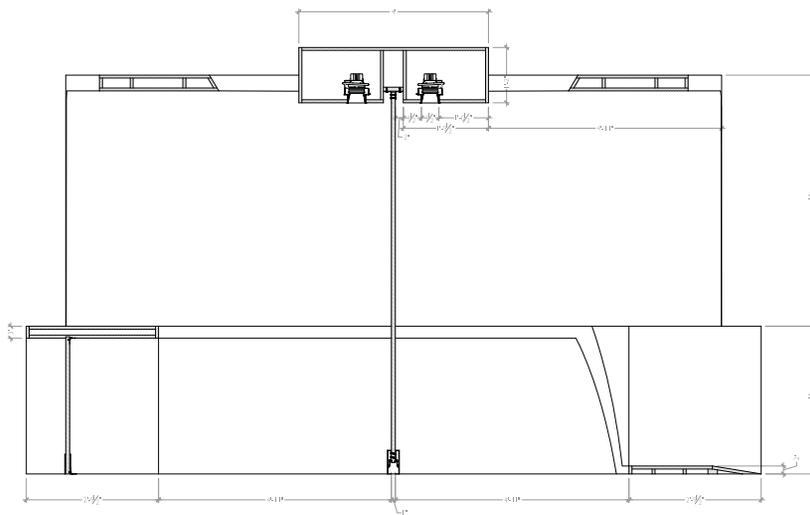
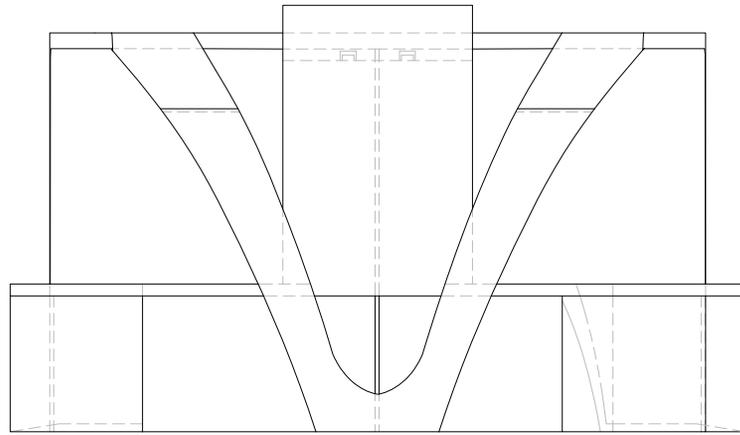


Figure 74. Check-in Counter, Section Detail

SEATING, TYPICAL:

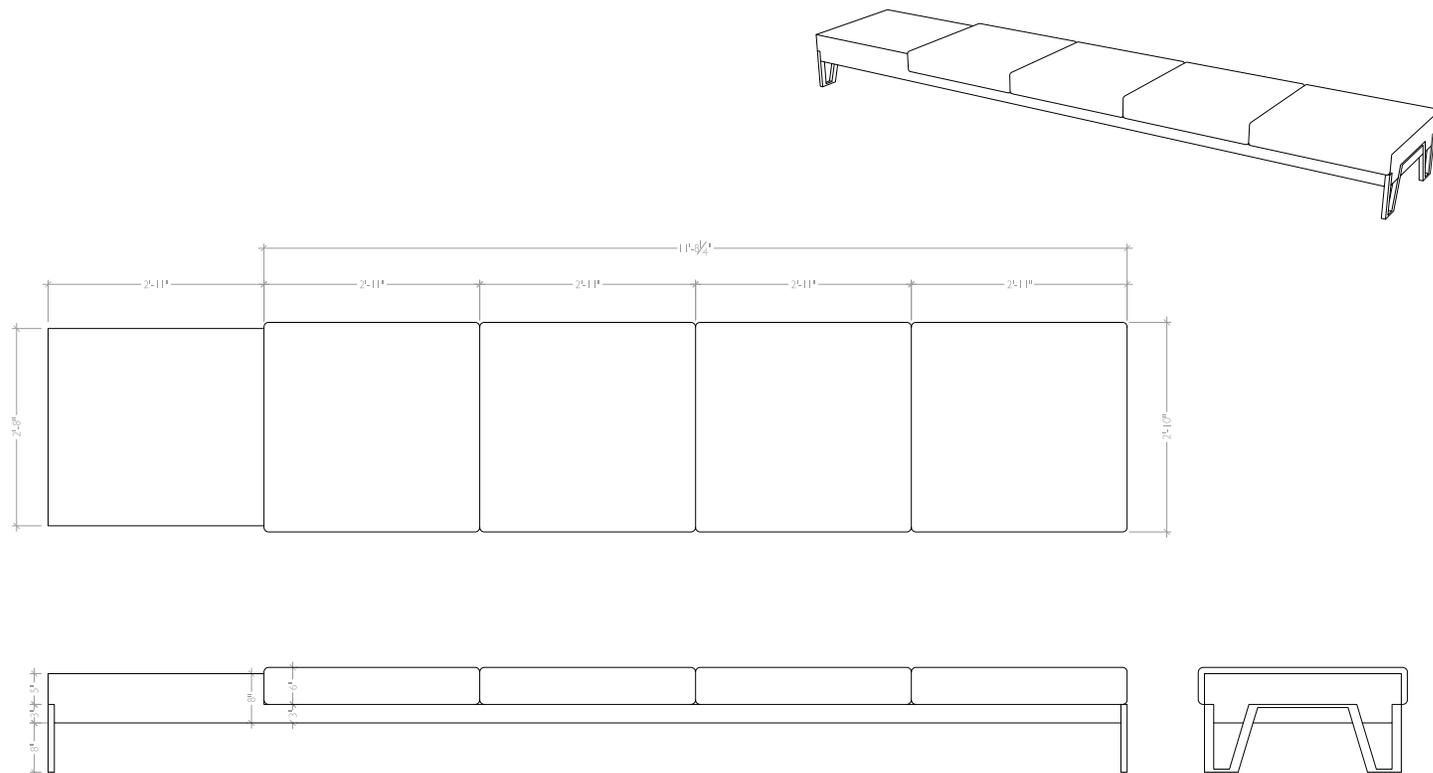


Figure 75. Seating Detail, Typical

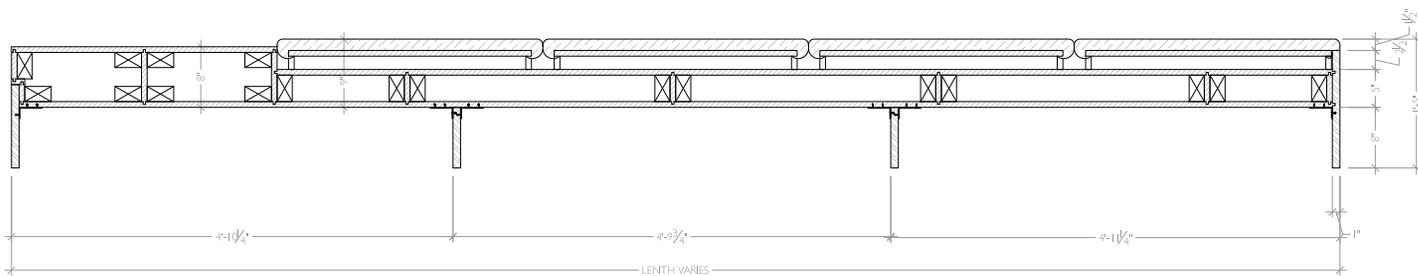
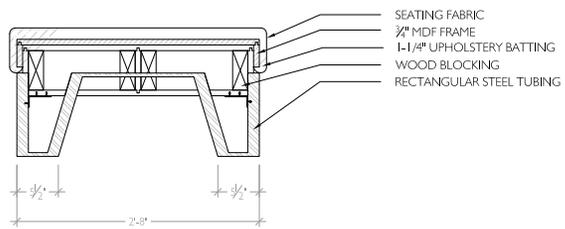


Figure 76. Seating, Section Detail

WELCOME SIGN:



Figure 77. Welcome Sign, Perspective

APPENDIX VI: Signage Detail

ARRIVALS SIGNAGE:

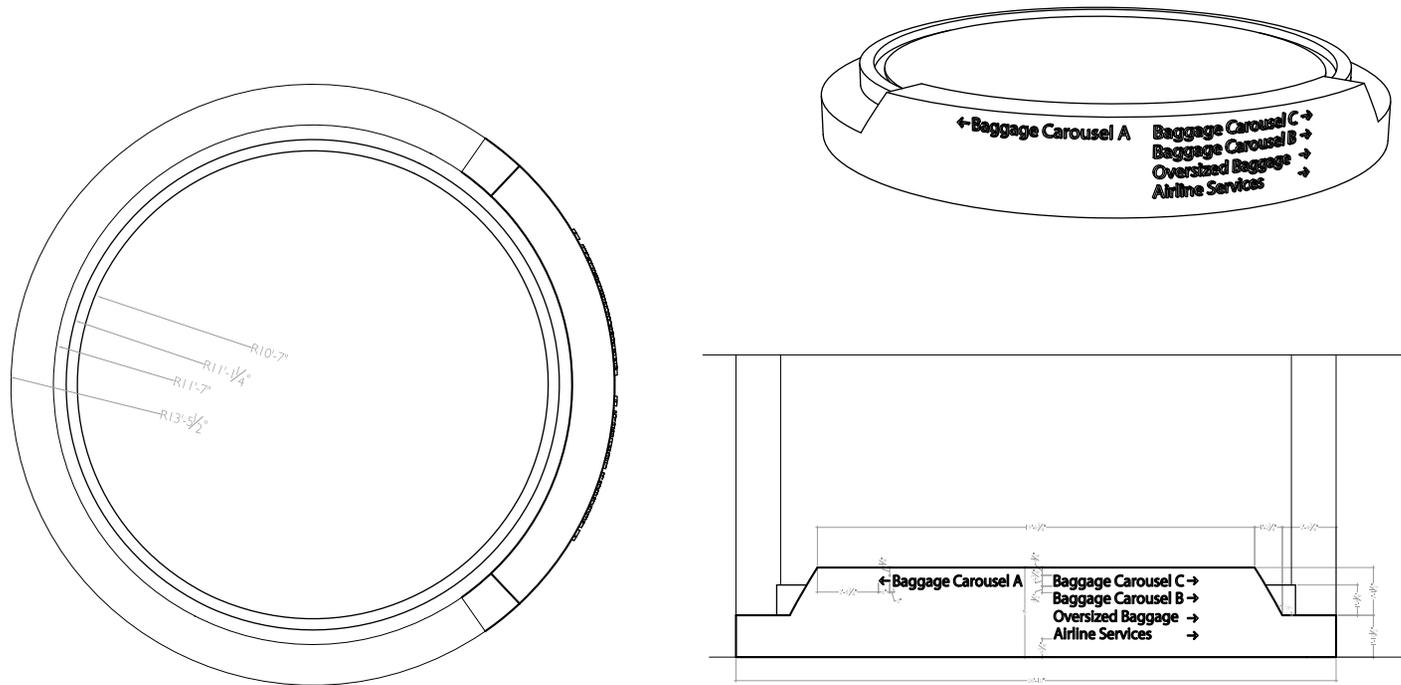


Figure 80. Arrivals Sign Detail

OVERHEAD SIGNAGE:

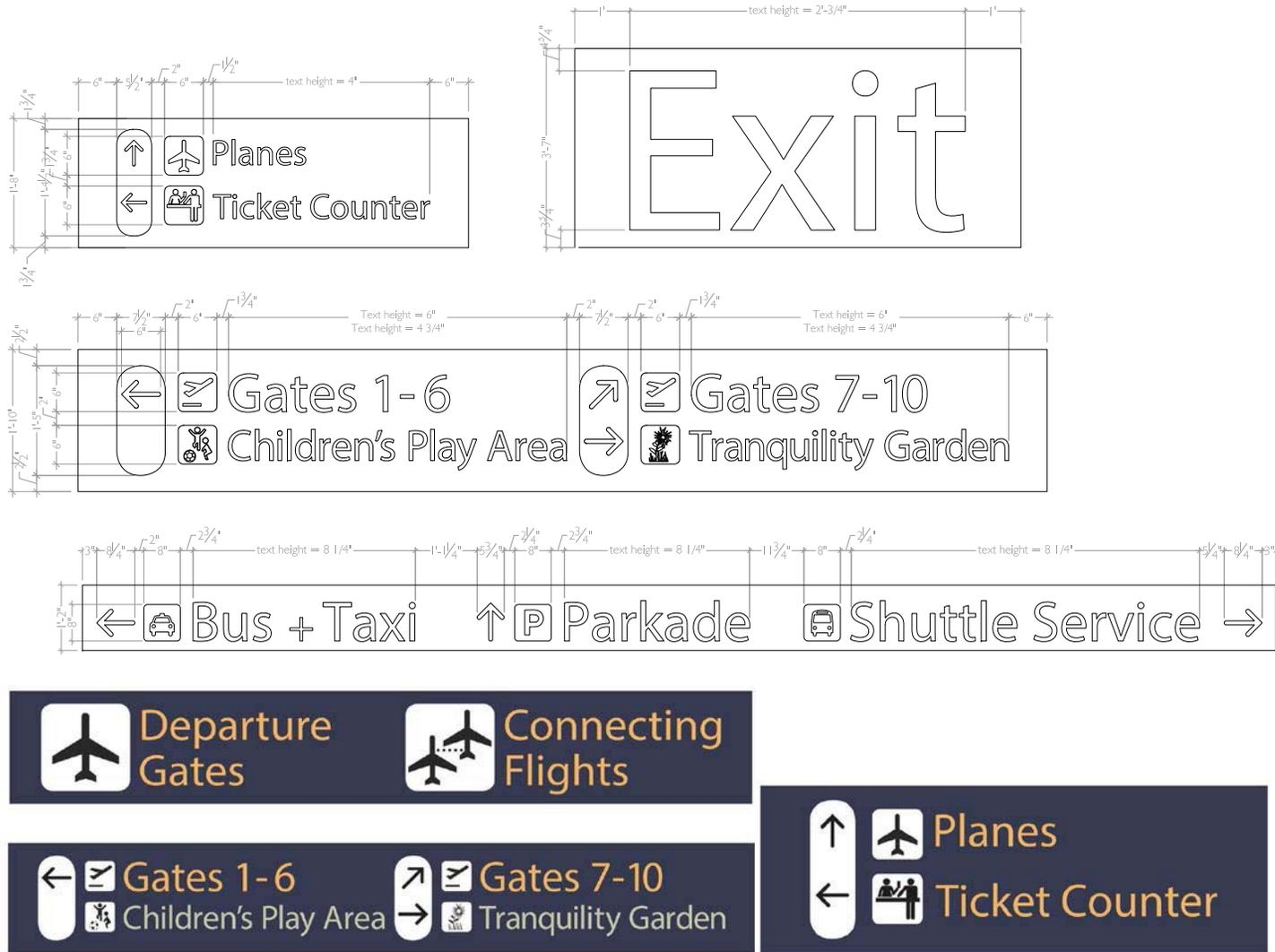


Figure 81. Overhead Signage, Detail and Colour Schemes

SIGNAGE VIEWING DISTANCES:

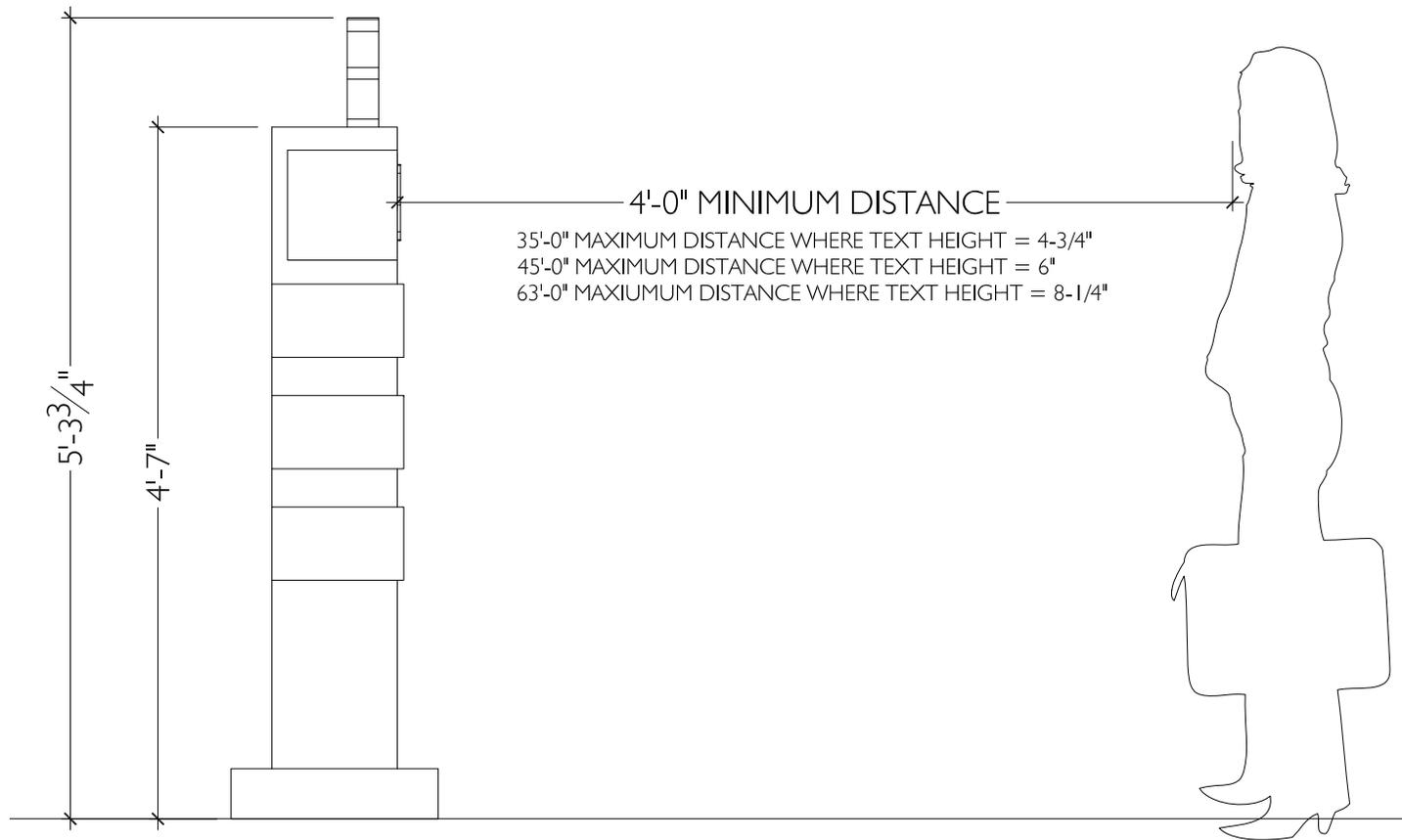


Figure 82. Welcome Sign Viewing Distance

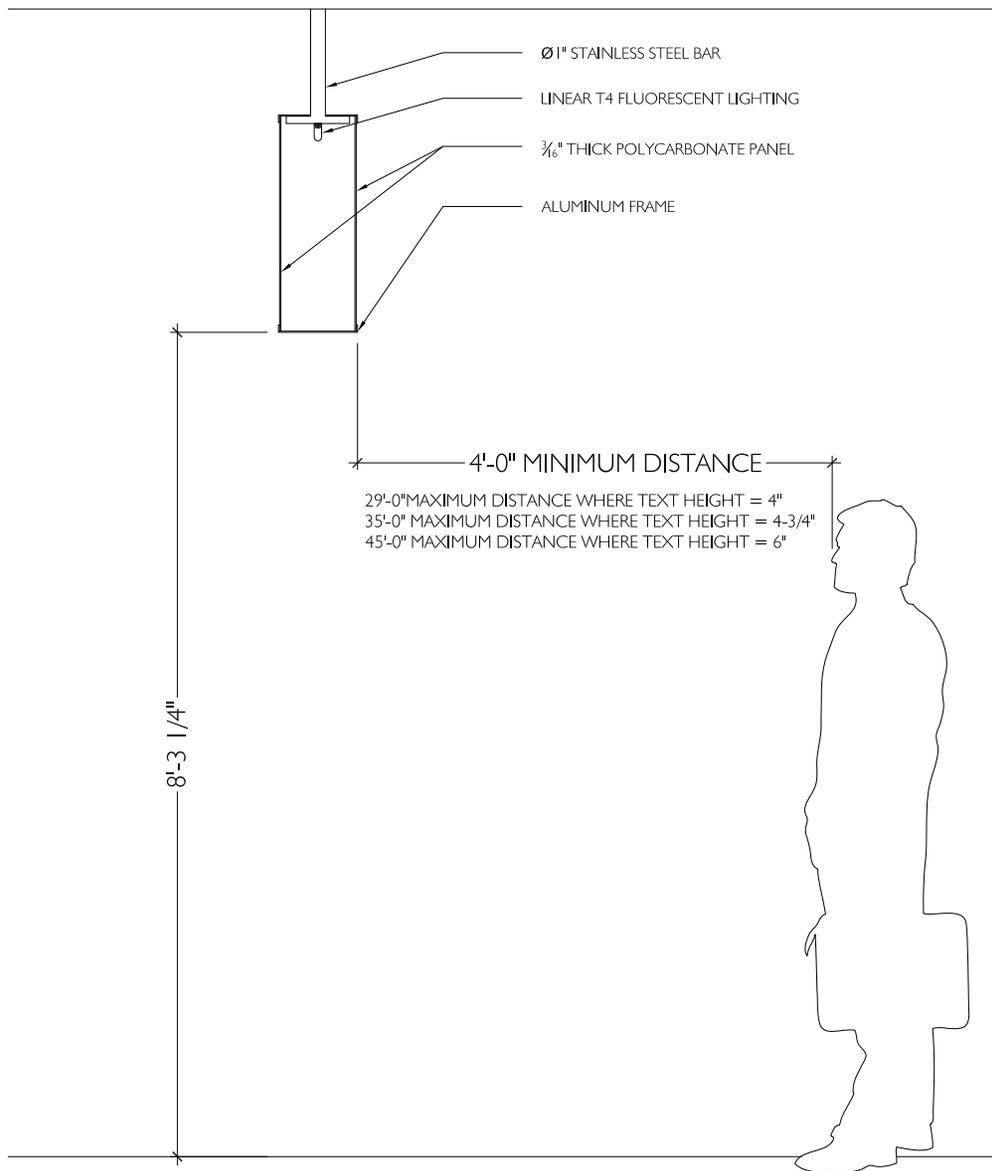


Figure 83. Overhead Sign Viewing Distance

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