

**CIVELL**

**Eliminating the Waiting Room in the Emergency**

**Department of Canadian Health Care Facilities**

by

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## **ABSTRACT**

Waiting is a common experience in medical environments that is often characterized by stress, chaos, boredom, uncertainty, loss of privacy, suffering, pain, and even death. Prolonged waits in the emergency department can induce psychological distress in the occupants, which can further lead to a multitude of physiological illnesses. While technological innovations over the past few decades have led to tremendous progress in the medical field, the design of waiting areas within the emergency department of Canadian hospitals has failed to advance accordingly.

Historical and contemporary examples of Canadian health care facilities define the waiting “room” as a singular and enclosed space, where the only activity promoted within its constraints is waiting. Further observations show that waiting areas act collectively as a series of buffer zones that are occupied and utilized by patients, visitors, and staff members. Rather than eradicating wait times and dismissing the current Canadian health care system, the proposed design project aims to transform the passage of time associated with anxious waiting into a productive, safe, and positive emotional experience for all occupants. The project severs the familiar boundaries of the waiting room, and introduces a series of interconnected activity spaces that suggest flow and movement. The design also ensures that the site’s primary functions as a national historic location and an active research landscape are preserved.

## **ACKNOWLEDGEMENTS**

Adverse personal experience initiated my interest in researching and examining the current state of waiting rooms in Canadian health care facilities. I retain vivid memories of sitting in the emergency department of hospitals, waiting for potential life-altering results, and succumbing to severe states of rumination and panic. However, external experiences of close relatives, friends, and even strangers propelled me to examine this issue further, and to base my thesis research on the design and reconstruction of waiting spaces in the emergency department.

First and foremost, I would like to thank my family and close friends for providing me with the support and motivation that pushed me to bring this project to completion. I would like to thank my thesis advisor, Federica Goffi, for keeping me encouraged and focused on formulating a solution to a an issue that collectively affects almost every individual in contemporary society. I would also like to express my gratitude for professor Goffi's efforts in establishing personal connections with professionals affiliated with the health care design industry, who provided critical suggestions during the research and development phase of my project.

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# 01

## INTRODUCTION



Figure 1. Receiving Social Support vs. Waiting Alone

The following chapter investigates the history of waiting rooms in Canadian health care environments, defines occupant typologies within these environments, and explores the perception of the passage of time associated with waiting in the emergency department of hospitals.

The concluding section introduces a design project that proposes to transform emergency department waiting rooms into productive spaces of activity that engage all occupants, while minimizing psychological distress.

## INTRODUCTION

Health care facilities play an essential role in the well-being of contemporary society. The average citizen may require professional medical treatment and hospitalization numerous times in the course of a lifetime. Hospitalization is often perceived as a negative experience that is characterized by pain, suffering, and loss of control.

Waiting is an inevitable component in the lengthy process of a hospital stay. Waiting areas serve to manage the discrepancy between the plethora of patients that require medical assistance, and the number of available physicians. These spaces are occupied not only by the anxious patient, but also by staff members and the patient's social support system.

All occupants spend a significant time in the waiting room, where they are exposed to unique adversities. Patients and visitors succumb to a destructive cycle of rumination and psychological distress. The medical team and service staff are constrained within these stressful and chaotic environments, where they are occasionally expected to carry out life-saving procedures, with little opportunity for relief.

Canadian health care facilities promote health in modern society, but often fail to provide restorative waiting environments that address the social and psychological well-being of their occupants. Efforts and funding have been invested in the ongoing reform of medical facilities, but the waiting room of the emergency department remains a primary source of stress, anxiety, and unnecessary expenditures. Research indicates that wait times can only be reduced and not completely eradicated.<sup>1</sup> Therefore, there is an urgency to architecturally transform emergency department waiting zones into comfortable, engaging, active, and effective areas that help to minimize physical and psychological distress.

- In 1947, the World Health Organization defined health as "a state of complete physical, mental and social well-being and not merely the absence of disease and infirmity."

## 1.1 The Waiting Room

In order to gain a clear understanding of the issues associated with modern-day waiting areas, it is crucial to briefly examine the history of the waiting room. The first North American hospital was established in the 17<sup>th</sup> century.<sup>2</sup> Waiting rooms did not appear in public health care institutions until centuries later. The functionality and usage of these spaces has continually evolved to suit society's values, needs, and economy.



### In the 20<sup>th</sup> Century

The early 1920's exhibited vast advancements in hospital construction. A shift in the construction of hospitals, from an open pavilion-plan to a block-plan, resulted in the design of smaller, private inpatient rooms. World War I led to the first incidents of overcrowding in medical centres. Outpatient departments were built to receive and serve the crowds of poor and underprivileged citizens. Inpatient pavilions were built separately, but in proximity to the hospital, and welcomed only the affluent members of society.<sup>3</sup>



Figure 2. Ottawa Civic Hospital Waiting Room, 1926

Outpatient departments in the early 20<sup>th</sup> century were integrated into the main medical facility, but were accessed through a separate entrance. Following the 1920's, these departments were structurally segregated from the hospital and built as separate units. The waiting room became a central element in the composition of these spaces.

The design of outpatient waiting rooms was inspired by grand city architecture, often resembling the arrival halls of railway stations. Classical columns supported expansive vaulted ceilings, and multiple skylights allowed ample light to permeate the spaces from above (*Figure 2 & Figure 3*).

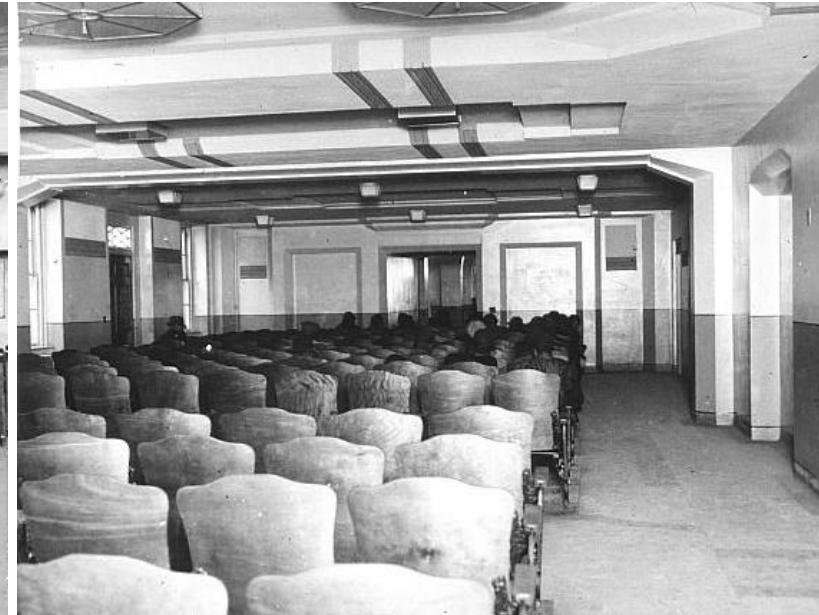
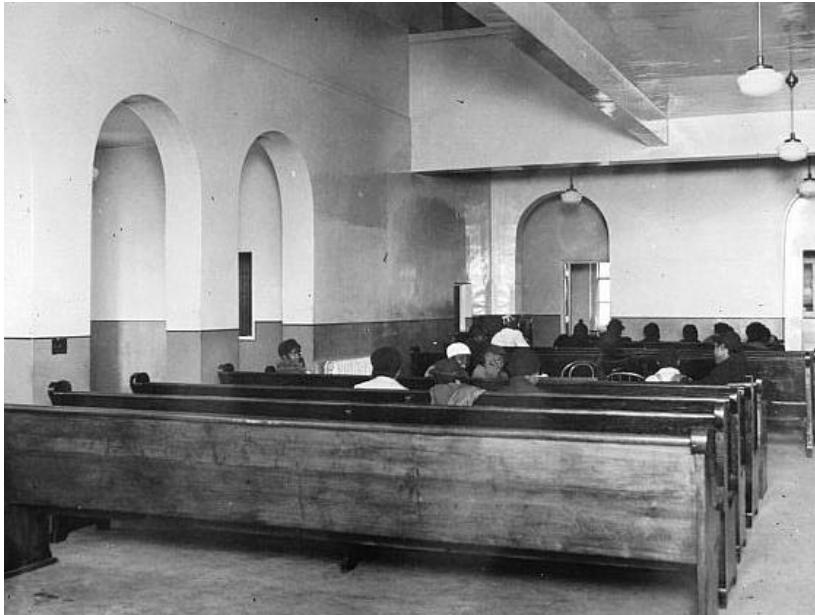


Figure 3. Chicago Railway Station Waiting Hall, early 1900's

## GRADY HOSPITAL, ATLANTA

Figure 4 (Left). African-American Waiting Room, 1936

Figure 5 (Right). White Waiting Room, 1936



Patients were additionally segregated according to racial profile and social class. Patients of colour were clustered together in endless rows of benches (*Figure 4*). White patients waited in rooms that provided individual seating (*Figure 5*). While lower-class citizens were confined within the public realm of outpatient waiting rooms, wealthy citizens stayed in private inpatient pavilions. These luxurious pavilions offered a domestic and cozy environment, which simulated the leisure realm of the home.<sup>4</sup>

 **The Modern Waiting Room**

The modern waiting room of a health care facility is commonly perceived as a chaotic environment that generates negative feelings of frustration, stress, uncertainty, anger, extreme dependency, loss of control, rumination, and boredom.<sup>5</sup> Loud and repetitive sounds, a continuous influx of patients, constant activity, overcrowded seating areas, a deficiency of staff members, and a lack of information are among the many factors associated with a hospital waiting experience. Prolonged waits in disorganized and mentally-exhaustive environments can debilitate a patient's physical condition. Contrary to the health sector's intention to nurture health and treat illness, waiting rooms generate toxic environments for all occupants.

Modern-day waiting rooms are comprised of a series of transitional areas, rather than discrete enclosed spaces, and are dispersed throughout a health care facility. They serve as buffer zones that regulate the process of hospitalization, from the time the patient arrives at the facility, to the time of the patient's discharge (*Figure 7*).

Waiting areas maintain a multitude of purposes. They accommodate not only the patients seeking assistance, but the patients' family and friends, as well as the medical and service staff responsible for maintaining order and administering treatment. Waiting areas transform into public stages for grieving family members who receive dire news regarding their loved one's condition.

Safety is a primary concern in these multifunctional and chaotic spaces. The spread of infection is a common occurrence in waiting areas, such as the emergency room, where crowds of undiagnosed patients await treatment. As nursing staff attempt to organize patient lists and attend to the needs of every sufferer, service staff members navigate medical equipment through cluttered, narrow waiting corridors.

Health environments are imperative to the well-being of society. Factors such as social support, staff and patient safety, fresh air, and overall cleanliness and order should be addressed in the design of both the physical and social elements of waiting spaces.<sup>6</sup>

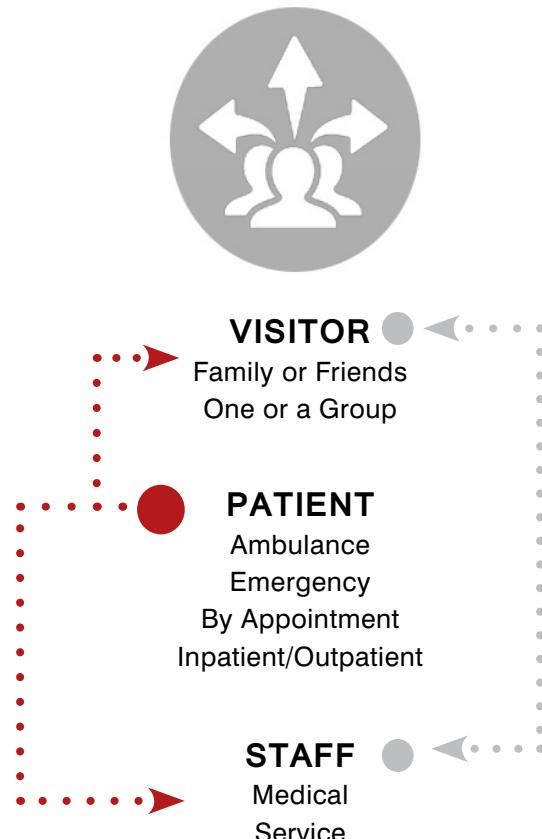


## THE OTTAWA CIVIC HOSPITAL

Figure 6 (Top Left). Hallway Waiting Zone, 2014

Figure 7 (Bottom Left). Hallways Holding Stretcher Patients Waiting for Assessment, 2014

Figure 8 (Right). Emergency Room Waiting, 2014



## 1.2 Occupant Typologies

Each occupant of a health care facility experiences a different and unique process of waiting. Levels of anxiety, stress, optimism, rumination, and other emotional states fluctuate throughout the duration of the waiting period.<sup>7</sup> Individual differences guide occupants to manage distressing events in differing manners. Patients, visitors, and staff members are the three primary occupants of a hospital's waiting area.

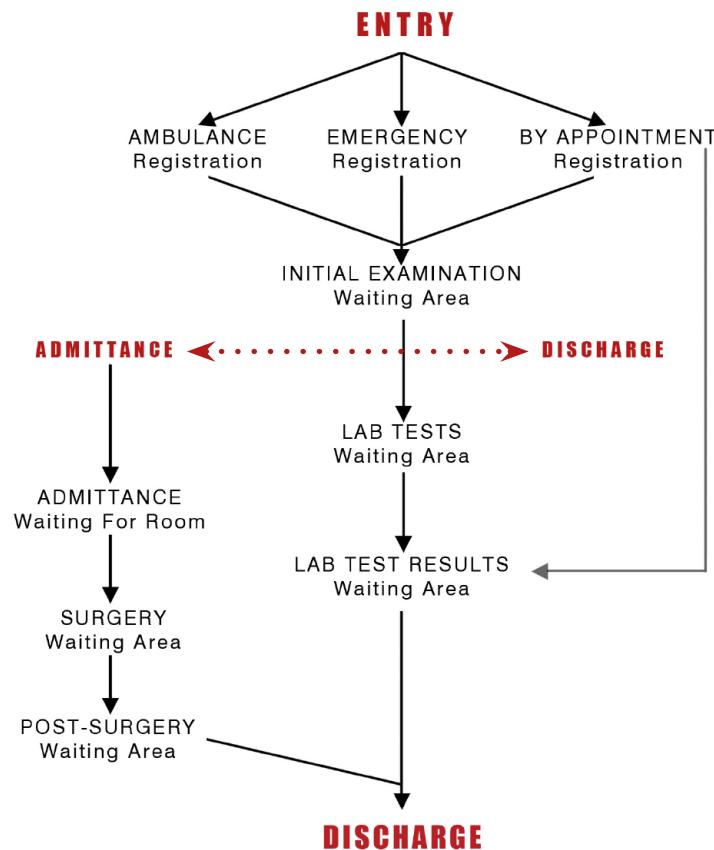


Figure 9. Waiting Process for Typical Hospital Patient from Admission to Discharge

### The Patient

The patient of a health care facility is expected to wait for an assessment, diagnosis or treatment. The patient's role during the waiting process is to remain cooperative and passive, and yield full control to unknown members of the medical staff. Dozens of patients are melded in confined areas, where their identities, social class, career status, and personal relationships usually lose all significance. The individual patient is reduced to a mere element of a larger institutional structure.

The patient's physical health may deteriorate in a waiting environment due to long wait times or exposure to infection. The patient may not be able to receive the support of friends and family members in restricted waiting areas of a medical facility. Lack of social support, loss of privacy and control, and uncertainty for the future also harm the mental well-being of the patient. A poorly-designed waiting area generates an environment where all patients are processed in a similar manner, and stigmatized according to their illness.<sup>8</sup>

- *Each type of occupant in a healthcare facility experiences distinct patterns of waiting. These patterns may be affected by the physical environment, the patient's medical condition, the visitor's emotional state, or the staff's stress levels.*
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### ► The Visitor

The visitor is an accompanying family member or friend of the patient. Patients may be accompanied by one visitor or a group of visitors. The role of the visitor is to wait alongside the patient before treatment, or wait alone during the patient's medical assessment. Visitors typically remain uninvolves in the treatment process of the patient.<sup>9</sup> The visitor is subject to increased levels of stress and anxiety, caused by uncertainty of their loved one's future diagnosis. The chaotic environment of a waiting area affects not only the patients' well-being, but also the psychological and physical health of visitors.

### ► Staff Members

The staff members of a medical facility include doctors, registered nurses, volunteers, and service staff. In a waiting area, these individuals often experience increased levels of stress as they aid and treat patients, while simultaneously providing guidance to visitors. All staff members are directly or indirectly involved in the care of patients and visitors.<sup>10</sup> Waiting areas pose numerous safety risks to staff members, where the likelihood of exposure to unidentified infectious diseases is prominent. Nurses and service staff members often transport medical equipment and dangerous biological waste through crowded waiting rooms and waiting halls. Toxic working environments affect the quality of care provided by the staff, and ultimately affect the well-being of the patient.

### 1.3 The Act of Waiting

Waiting is an action that is practiced, endured, or suffered on a daily basis and in a variety of situations. It is often perceived as an unwanted and wasteful experience that may lead to unpredictable outcomes and unexpected self-encounters.<sup>11</sup> Two main types of waiting experiences exist. The first type of waiting experience has a known and certain outcome, such as waiting for a train's expected arrival. Although the waiter may perceive this experience as irritating or boring, the wait generates a quick resolution. The second type of waiting experience leads to an unknown result, such as the wait for a medical diagnosis in the emergency unit of a hospital.<sup>12</sup> Prolonged periods of uncertainty may produce states of elevated anxiety and stress. A waiter who is patient processes time calmly and effortlessly, without becoming dependent on it. An impatient waiter suffers through the passage of time.<sup>13</sup>

Waiting environments in health care facilities are occupied by impatient waiters, who succumb to feelings of uncertainty and loss of power over time. The passage of time becomes a negative and wasteful experience in which the subject becomes

entrapped.<sup>14</sup> Anxious waiting generates a heightened awareness and sensitivity to the surrounding physical environment, and to the passage of time. French philosopher, Sylviane Agacinski, theorizes that "we are the age of our objects and experience our own aging at the same time as theirs". As the impatient waiter observes the surrounding physical environment, his or her existence reduces to only a physical fragment of it. Consequently, the waiter attains a "pure object status," which provokes a state of frailty, uncertainty, and anxiety.

- "The waiter no longer perceives the hour as a line
- along which time moves independently of her, but as
- a duration which she must embody and traverse."<sup>15</sup>

The patient's mental cognition fluctuates at different stages of the waiting period. An awareness of the passage of time and a heightened self-consciousness produce repetitive thoughts associated with rumination.<sup>16</sup> Rumination decelerates the waiter's perception of time's passing, where surrounding distractions often cannot alleviate the sense of entrapment.

## 1.4 Design Proposal

A well-designed waiting area in a medical facility has the potential to transform waiting into a productive, rather than wasteful, experience. An effective waiting experience can consequently reduce the negative psychological effects associated with rumination, stress, and anxiety. The patient's overall impression of the medical service provided by the health care organization largely relies on the waiting experience within it.

The proposed site for the design project outlined in the following chapters is Ottawa's Central Experimental Farm (CEF). The CEF is situated directly across from the existing Civic Hospital, and functions as a national historic site and an active research centre.<sup>17</sup> Sixty acres of the farm's land have recently been allocated for the building of a new Civic Hospital campus.

### ► Design Questions

What statistical and theoretical strategies can be applied to the physical design of waiting spaces within the emergency department of health care facilities, and the future Ottawa Civic Hospital? How can the existing site and surrounding community guide this design, in order to promote the health and well-being of all occupants?

## Project Statement

The “waiting room” of the emergency department in modern Canadian health care facilities should be eliminated and replaced with interconnected zones of activity that promote the physical and emotional well-being of all occupants, increase productivity, and facilitate the treatment process.

## Chapter Notes

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- <sup>1</sup> Canadian Institute for Health Information. "Health Care in Canada, 2012: A Focus on Wait Times." Ottawa: CIHI, 2012. Web. Sept. 2014. p. 3.
- <sup>2</sup> Armstrong, Pat, and Hugh Armstrong. *Wasting Away: the Undermining of Canadian Health Care*. New York: Oxford UP, 2010. Print.
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- <sup>5</sup> Gatchel, Robert J., and Andrew Baum. *An Introduction to Health Psychology*. Massachusetts: Addison-Wesley Publishing Company, 1983. Print. p. 151.
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- <sup>7</sup> Sweeny, Kate, Sara Andrews. "Mapping Individual Differences in the Experience of a Waiting Period." *Journal of Personality and Social Psychology*, 106 (2014):1015-1030. Print.
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- <sup>11</sup> Schweizer, Harold. "On Waiting." University of Toronto Quarterly 74.3 (2005): 777-791. Carleton University Library. Web. Oct. 2014.
- <sup>12</sup> Sweeny, Kate, Sara Andrews. "Mapping Individual Differences in the Experience of a Waiting Period." *Journal of Personality and Social Psychology*, 106 (2014):1015-1030. Print.
- <sup>13</sup> Schweizer, Harold. "On Waiting." University of Toronto Quarterly 74.3 (2005): 777-791. Carleton University Library. Web. Oct. 2014.
- <sup>14</sup> Ibid.
- <sup>15</sup> Ibid.
- <sup>16</sup> Sweeny, Kate, Sara Andrews. "Mapping Individual Differences in the Experience of a Waiting Period." *Journal of Personality and Social Psychology*, 106 (2014):1015-1030. Print.
- <sup>17</sup> Canada. Government of Canada. Agriculture and Agri-Food Canada. *Central Experimental Farm National Historic Site Management Plan*. [Ottawa]: Agriculture and Agri-Food Canada, 2012. Web. Jan. 2015.

# 02

## LITERATURE REVIEW & CASE STUDIES



Figure 10. Anxious Waiting

The following chapter discusses the scientific link between mental processes and the resulting physiological responses of the body. Additionally, theoretical research explores strategies for alleviating the adverse effects caused by psychological distress.

The last two sections of the chapter investigate a historical and a modern example of waiting room design in public Canadian health care facilities, with the aim to derive a basis for the subsequent project proposal.

## 2.1 Mind-Body Relationship

The waiter's surrounding environment can act as a powerful mediator of psychological response and biological functioning. A physical environment can trigger certain cognitive processes, which can induce further physiological responses. The occupant's experience and satisfaction in a waiting room setting, rather than the length of the wait, regulates the well-being of the occupant.<sup>1</sup>

Pain, commonly understood as a physiological response of the body, can be affected by psychological factors. Heightened states of anxiety, for example, lead to a decrease in pain tolerance.<sup>2</sup> The transformation of waiting areas into restorative environments, which promote emotional support and psychological well-being, can improve the overall health of all occupants.

A debate over the mind and body relationship was sparked in the 17th century, when French philosopher, René Descartes, proposed that physical matter and psychological processes are distinct entities, independent of each other. This theory of *Dualism* suggested that the mind could not impose a direct

effect on the somatic processes of the body, and illness and disease were attributed solely to physiological systems. Eminent psychologists and physiologists of the 19<sup>th</sup> century, Sigmund Freud and Claude Bernard, disputed the theory of Dualism. They emphasized the relationship between emotional states and physiological functioning.<sup>3</sup>

Numerous scientific and psychological studies conducted over the past century have shown positive correlations between body and mind. Despite the understanding that disease is not simply a biological phenomenon, but a transaction between physiological processes and the inhabited physical environment, the current Canadian health care system continues to rely on allopathic medicine for curing illnesses and disease. Invasive and potentially harmful measures, such as drugs and surgical procedures, are used to treat all cases of psychological and biological illnesses.<sup>4</sup>



### 2.1.1 Psychological Effects

The physical environment of a waiting room, the occupants' interaction with this environment, and the social interaction between different occupants, can elicit certain psychological responses.<sup>5</sup> The state of uncertainty, often associated with a hospital wait, can induce a range of negative psychological responses. The symptoms of psychological distress are difficult to recognize and assess, as they are not the primary focus of a clinical treatment process. Thus, individuals experiencing psychological distress in the waiting area of a health care facility are often left to suffer, while their physical condition simultaneously deteriorates.

### INTENSITY OF EMOTIONS Associated with Waiting in Health Care Facilities

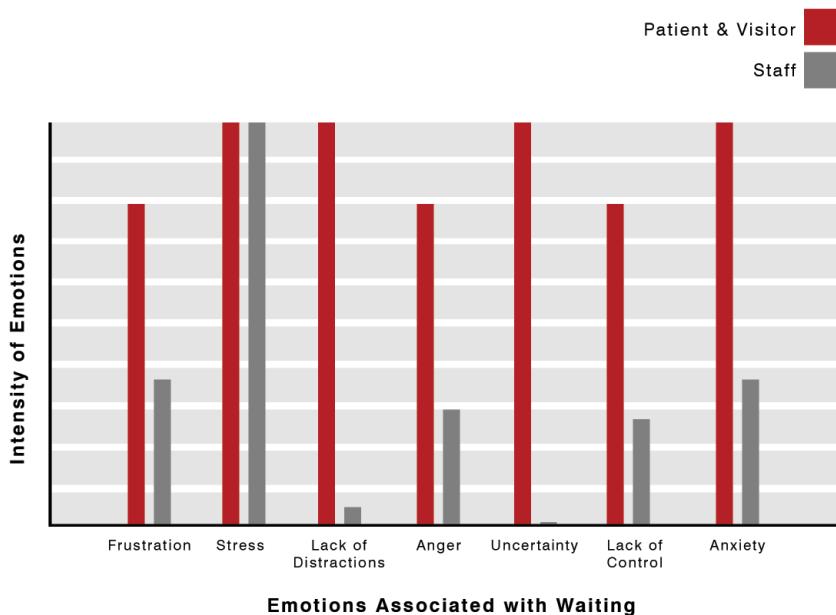


Figure 11. Intensity of Psychological Effects while Waiting  
\*Source: *The Ecology of Waiting within an Ambulatory Waiting Room*

 **Stress**

Stress is a common, every-day occurrence in the life of every individual. Its detrimental effects, however, are most prominent in medical waiting environments. Stress is the psychological response of an organism, whose well-being has been challenged by environmental stressors. Environmental stressors are components of the physical surroundings that endanger or threaten the organism's vitality.<sup>6</sup>

An adverse encounter between the organism and its environment can trigger stress and its undesirable biochemical, physiological, psychological, and behavioural responses. Patients and visitors in a waiting area of the emergency department are subject to stress caused by tragic personal events, such as the loss of a loved family member. Routine background stressors, such as daily noise distractions, are lower in intensity. A health care facility's medical staff and service staff often suffer from the cumulative effects of routine background stressors.

Most individuals develop coping strategies to reduce the stress caused by adverse events. Individuals who have difficulty coping with stressful situations may suffer from psychological

and mental illness.<sup>7</sup> Stress often manifests with the anticipation of a threatening event, prior to the onset of the event. Waiting spaces in health care facilities serve to accommodate patients and family members who are anticipating a negative prognosis. Simply the prospect of a prolonged wait, rather than the reception of a diagnosis, induces stress. Although adverse events provoke anguish and suffering, a well-designed emergency department waiting area can reduce unnecessary stress caused by the anticipation of an impending event.

 **Anxiety**

Anxiety is an emotional state characterized by feelings of hopelessness, fear, and apathy. In a hospital's emergency department, it develops due to an uncertainty of the length of wait and unavailability of information. A lack of interaction between patients and staff members also increases the patient's anxiety levels. The patient's psychological well-being consequently suffers from a lack of assurance, support, and comfort by professional staff.<sup>8</sup>

## ► Entrapment

Feelings of entrapment are closely associated with the passage of time. Visitors of a health care facility experience entrapment as they await medical assessment or treatment. The level of entrapment is affected by the length of the wait and the availability of information. Patients may perceive longer wait times as a personal investment in their health and well-being, but may consequently suffer from an increased sense of entrapment. A lack of information regarding the treatment process can also instill a sense of entrapment. Entrapment can cause emotional distress that may lead to a decline in overall physical health.<sup>9</sup>

### 2.1.2 Physiological Effects

Waiting prompts a multitude of physical and psychological responses that negatively affect the well-being of the impatient waiter. The physical responses may be easier to observe and assess than the psychological responses, as they often exhibit quantifiable symptoms. Psychological distress associated with waiting can have a detrimental impact on the physical condition of the waiter. Positive and relaxed states are linked to lower heart rates. Prolonged exposure to environmental stressors, such as the constant noise and crowding in hospital waiting rooms, may

increase heart rate, raise blood pressure, affect breathing, and induce inflammation in the body.<sup>10</sup> All occupants of a waiting room, including patients, family and staff members, are subjected to the cumulative physiological effects of daily stressors.

Individual, traumatic events can also inflict detrimental effects on the physical health of an individual, directly or in the future. Waiting rooms in health care facilities often accommodate the patient's grieving friends and family members who receive devastating news regarding their loved one's condition. Unexpected and intensified stressors can cause decreased immune functioning, prolonged increase in heart rate, and heart disease in the future.<sup>11</sup> Although the impact of traumatic information cannot be eliminated completely, its severity may be reduced by a restorative physical environment that provides effective support and coping conditions.

Genetic factors and individual differences play undeniable roles in an individual's susceptibility to stress, and its impact on bodily functions. However, a waiting environment that addresses the psychological needs of its occupants can improve their physical health, as well as promote the perceived value of the overall health care system.

## 2.2 Controlling Psychological Distress

Waiting results in a heightened self-awareness and an amplification of psychological distress. Stressors that cause psychological illness are difficult to measure in a quantifiable manner. Therefore, our knowledge and understanding of such maladies is largely reliant on data based on individual experiences. Environmental, social, and psychological factors affect our perception of environmental stressors.<sup>12</sup> Managing distress caused by waiting can inhibit physiological illness, and increase the overall health and well-being of the occupants of an emergency department waiting room.

### Social Support

Heightened states of anxiety and stress in waiting rooms can be controlled by altering the interaction processes between patients, staff members, and the physical environment.<sup>13</sup> Our psychological well-being is enhanced by the belief that we are valued and cared for by others, and by our sense of belonging to a larger social network.<sup>14</sup> Unfortunately, not all patients have the added support of family and friends. Individuals who await

medical assistance alone experience alienation, and suffer from increased anxiety and loss of control. Staff members can serve as a support network not only for patients without accompanying social support, but also for the family and friends of patients who are experiencing anguish due to their loved one's suffering.

### Incorporation of a Natural Environment

Physical health is associated with one's connection to nature. Restorative environments that include natural elements, such as greenery and fresh air, can induce an altered state of consciousness. Altered states of consciousness distract an individual from states of anguish and rumination.<sup>15</sup> Restorative environments do not simply eliminate possible stressors, but promote well-being by introducing soothing sensory stimuli. A natural environment, real or simulated, enhances our sensory awareness in order to provoke a sense of wonder and fascination. Natural environments alleviate psychological distress, promote emotional health, and help to improve overall well-being.

### Perceived Control

A sense of control, or efficacy, over our physical environment can mediate psychological anguish caused by waiting, such as stress, anxiety, and a sense of entrapment. Perceived control is also affected by our interaction with other individuals in the environment. Unlike the comfort and familiarity associated with being at home, patients and visitors experience a loss of control in the unfamiliar setting of a hospital waiting room. It is important for the occupants of the emergency department to maintain a sufficient level of control over their physical surroundings. Involving patients and family members in the treatment process of the patient, and allowing them to moderate certain aspects of their physical environment can minimize the sense of helplessness and uncertainty associated with waiting. It is also critical for medical and service staff to retain absolute control of all health care environments within a facility. Inability to do so can wreak chaos and havoc, which can aggravate the occupants' health. Perceived control, whether it exists or is simply implied, can alleviate the effects of stress, anxiety, and entrapment.<sup>16</sup>

### Ambiguity of Architectural Environment

The Attention Restoration Theory (ART) theorizes that humans employ directed attention to cope with the numerous demands of modern urban environments. However, continuous exposure to environmental stimuli that require directed cognitive attention can deplete coping resources, and cause mental fatigue. ART theorizes that directed attention fatigue can be restored by drawing attention to stimuli that have a sense of complexity and allure, but do not require excessive cognitive processing.<sup>17</sup>

A waiting environment should not provoke excessive cognitive processing, as this can lead to mental fatigue. Brightly illuminated spaces not only incapacitate psychological processes, but lead to mental exhaustion. Heterogeneous lighting and objects with ambiguous physical features, such as objects seen through a semi-translucent glass panel, can help to relieve mental fatigue caused by directed cognitive attention. Conversely, highly transparent or opaque materials can induce a sense of alienation.<sup>18</sup> Finnish architect, Juhani Pallasmaa, asserts that our architectural surroundings should not completely reveal their utilitarian characteristics, but should instill a sense of wonder and intrigue.



## 2.3 Emergency Department Wait Times

Since the beginning of the 21<sup>st</sup> century, wait times have been recognized as a primary concern in the planning and management of Canadian health care.<sup>19</sup> Canadian citizens experience long waits in all facets of their health care provision, from hours spent in the emergency department of a hospital, to months spent waiting to see a specialist. The subsequent data analysis and project design focus specifically on the issue of waiting in the emergency department of hospitals and high-volume community health care facilities. Hospitals and high-volume community facilities are defined as institutions that receive over 30,000 emergency visits annually.<sup>20</sup> Recent 2012 statistics show that Canadians make over 16 million emergency department visits every year, with wait times that significantly exceed global averages.<sup>21</sup>

Examining wait time statistics, as well as factors that affect wait times, will provide a clearer understanding of the underlying issues in Canadian health care. Recognizing the issues is imperative in proposing a design project that aims to address the waiting experience and improve the overall satisfaction of all occupants in a health care facility.

## FACTORS AFFECTING WAIT TIMES

### Outpatient Treatment

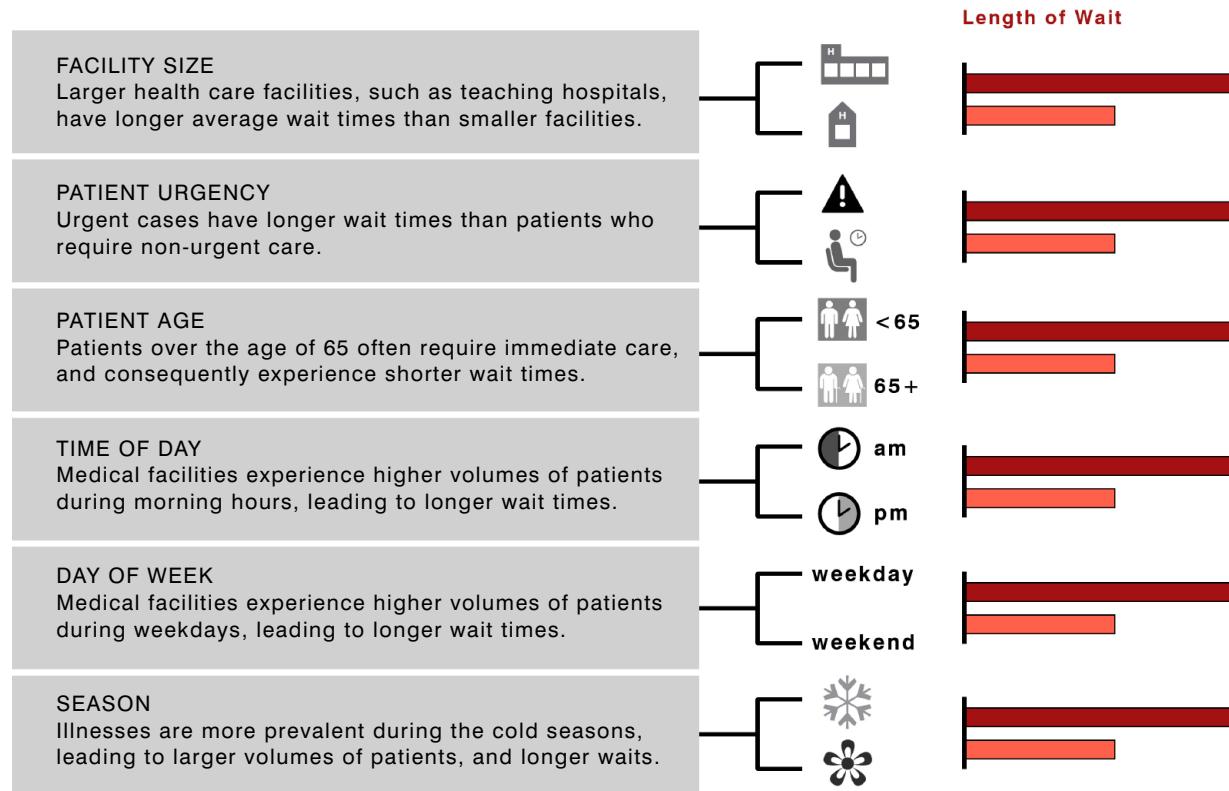


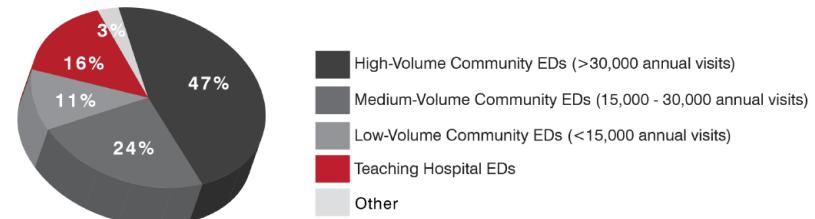
Figure 12. Factors Affecting Wait Times

\*Data collected from: Canadian Institute for Health Information (CIHI)<sup>22</sup>

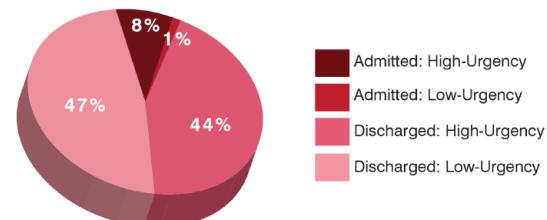
Canadian health care facilities are subdivided into several categories, according to the volume of visitors they receive annually, as well as the procedures they specialize in. Larger health care institutions, such as high-volume community hospitals, experience higher volumes of emergency department visits than low-volume community hospitals. Statistics show that teaching facilities, such as the Ottawa Civic Hospital, received 16% of all emergency department visits in 2005.

Emergency rooms were originally considered as spaces that serve to receive patients requiring immediate medical care due to severe injuries. In actuality, they provide treatment to all visitors, regardless of the severity of illness or injury.<sup>23</sup> Recent statistical data shows that emergency departments treat more low-urgency cases than high-urgency cases. This information is valuable in the subsequent project design, as it aids in determining the total floor area required for each urgency level.

► **Figure 13. EMERGENCY VISITS  
By Facility Type (2010-2011)**



► **Figure 14. ADMITTED & DISCHARGED PATIENTS  
by Level of Urgency (2010-2011)**



\*Data collected from: Canadian Institute for Health Information (CIHI), "Health Care in Canada, 2012: A Focus on Wait Times"

## WAIT TIMES IN CANADIAN EMERGENCY DEPARTMENTS

By Patient Urgency Level (2010-2011)

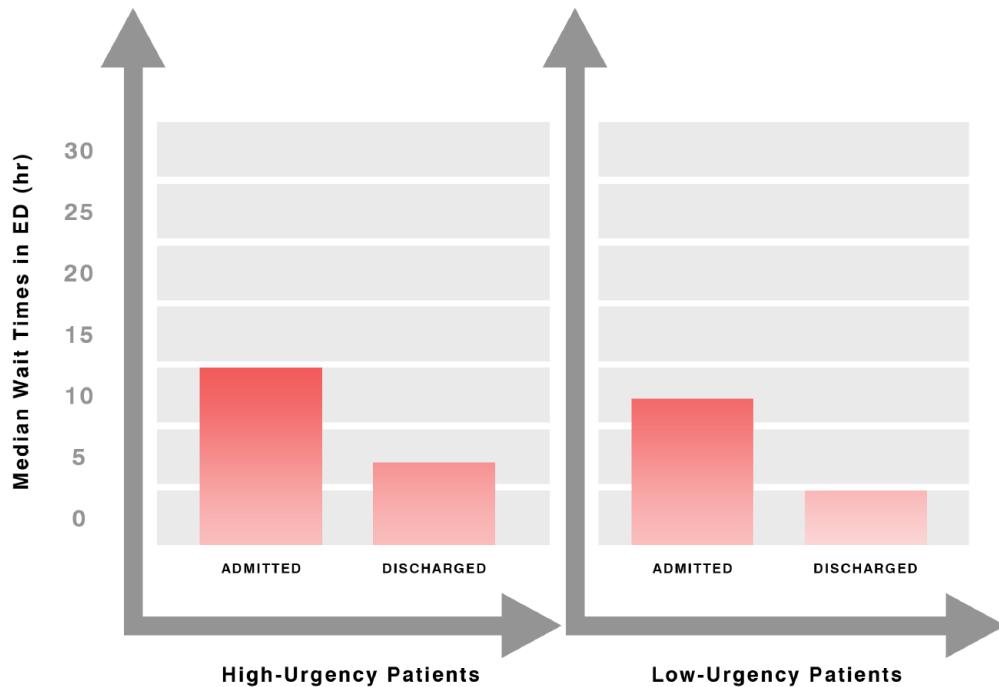


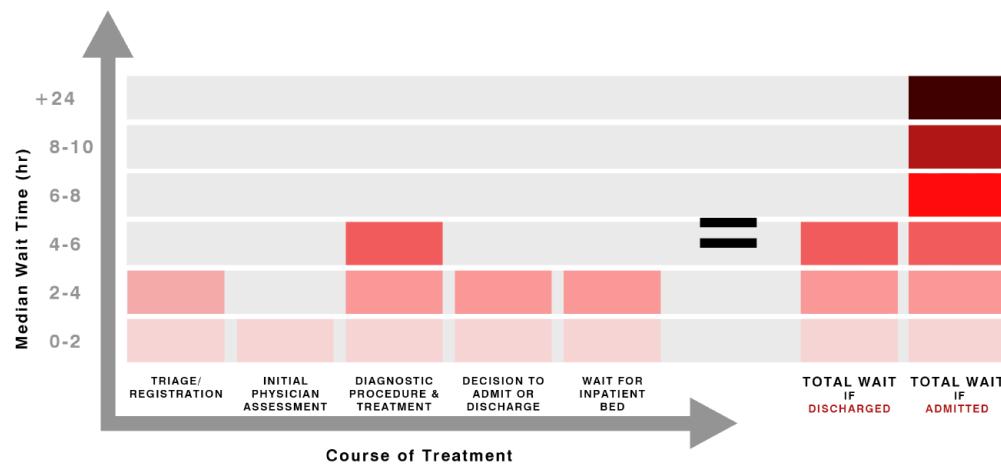
Figure 15. Wait Times by Level of Patient Urgency

\*Data collected from: Canadian Institute for Health Information (CIHI), "Health Care in Canada, 2012: A Focus on Wait Times"

The patient's medical condition impacts the length of stay in the emergency room of a hospital. CIHI statistics shows that wait times for admitted patients tend to be significantly higher than wait times for discharged patients. While high-urgency cases may be processed faster at the triage level, their total length of time spent waiting in the emergency department tends to be higher than lower-urgency cases.<sup>24</sup> A possibility for this occurrence is that patients with complex medical conditions may require numerous evaluations and specialized treatment, thus increasing the length of wait before a decision about their future care needs can be reached.

## MEDIAN OUTPATIENT WAIT TIMES

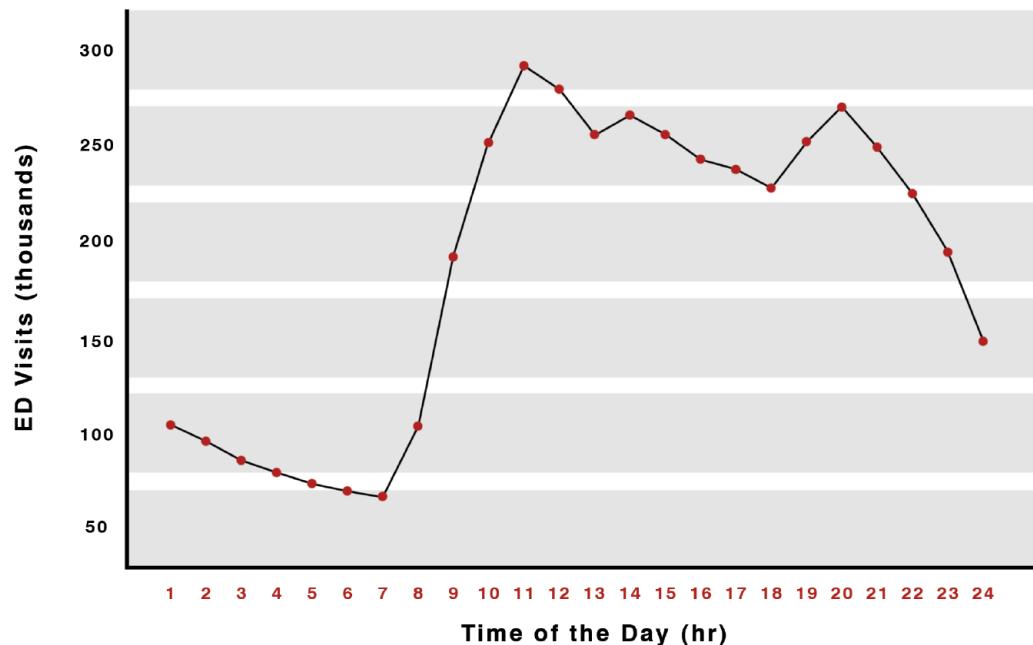
For Low-Urgency Patients in Teaching & Large-Community Hospitals in Canada



Time spent waiting in the emergency department is a product of the multiple steps involved in the course of treatment. The total wait time is defined as the time from which the patient arrives at the registration desk, to the time the patient is discharged or admitted to the hospital.<sup>25</sup> Figure 16 shows the median times at each stage of the waiting period, for typical low-urgency patients in Canadian hospitals. Recent data collected by CIHI shows that the total wait time for discharged patients is approximately 4.4 hours, and the total wait time for admitted patients is approximately 27 hours.<sup>26</sup>

Figure 16. Wait Times During Course of Treatment

\*Data collected from Canadian Institute for Health Information (CIHI), "Health Care in Canada, 2012: A Focus on Wait Times"



### ► TIME OF THE DAY

The time of the day and the day of the week affect the volumes of patients that visit the emergency department of Canadian hospitals. The adjacent graph shows fluctuations in patient volumes in the ED during the course of a day. Patient visits tend to increase rapidly in the morning period, between 7:00 am and noon, and decrease steadily in the afternoon and evening periods.

Figure 17. Waiting at Different Times of the Day

\*Data collected from: Canadian Institute for Health Information (CIHI), "Understanding Emergency Department Wait Times," 2005

## 2.4 Case Study A:

### THE OTTAWA CIVIC HOSPITAL

Location: Ottawa, ON, Canada  
Established: 1924  
Type: Teaching Hospital



Figure 18. Ottawa Civic Hospital  
Emergency Department Entrance, 2014

The Ottawa Hospital was established in 1998, when the Civic Hospital, the General Hospital, and the Riverside Hospital joined and assumed one name. The Ottawa Civic Hospital is a 456-bed teaching facility that provides emergency treatment and specialized care.<sup>27</sup> Teaching hospitals are associated with longer emergency department wait times, regardless of the patient's level of urgency.<sup>28</sup> Waiting areas dispersed throughout the hospital's seven floors provide seating, but offer little comfort and calming distractions for patients and visitors. Seats placed in rows allow patients to witness the chaos of the emergency unit, and expose them to potential infection and disease. While the waiting room of the emergency department allows natural lighting into the space, many waiting areas are located within the core of the building and do not have access to windows (*Figure 19 & Figure 21*). Additional undesignated waiting areas are comprised of a few plastic chairs placed in circulating corridors, which provide the waiter with a banal view of the opposite wall (*Figure 20*).



### THE OTTAWA CIVIC HOSPITAL

*Figure 19 (Left).*  
Radiology Waiting Room, 2014

*Figure 20 (Right).*  
Undesignated Waiting Area, 2014

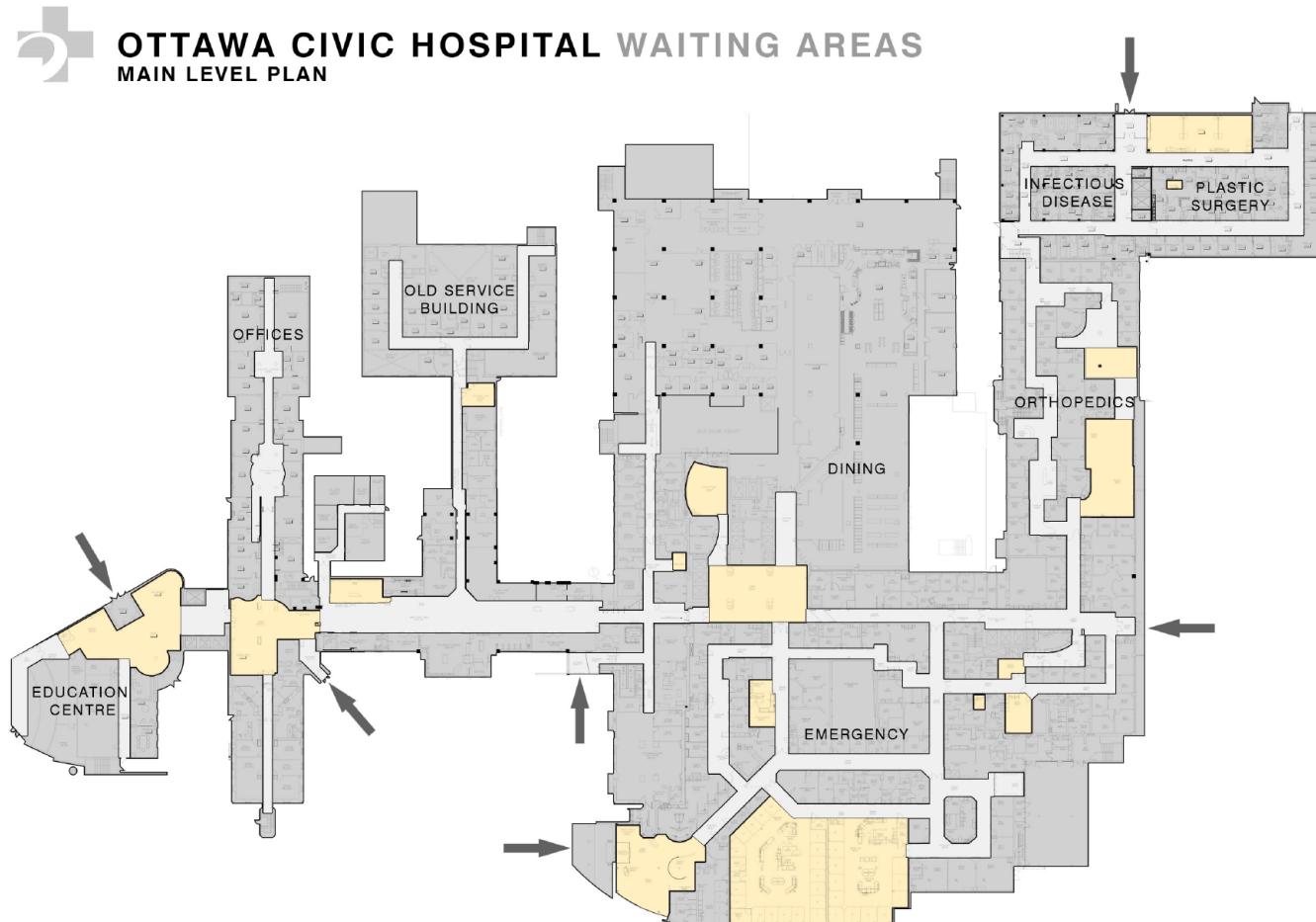


Figure 21.



*Figure 22* on the following page maps the wait times associated with the typical steps of a hospitalization process. The main level of the Ottawa Civic Hospital contains several departments, including the emergency unit, orthopedics, infectious disease, plastic surgery, and an education centre. Each department is served by one or more waiting areas, which accommodate patients and visitors who are at a specific stage in the waiting process (*refer to Figure 16*). Based on Canadian statistics gathered in the previous section, wait times associated with the varying stages of the hospitalization process are mapped as a colour gradient across the main-level waiting areas. For example, patients in the main waiting room of the orthopedics department have already proceeded through registration and triage, and are likely to spend 4 to 6 hours waiting for a diagnostic procedure and treatment.

The emergency department has the longest wait times, where large volumes of patients await initial assessments and information regarding further treatment. The large horizontal distances between the emergency waiting room and waiting rooms that serve patients in need of specialized treatment, such as infectious disease, are difficult to navigate through. Lobby and entry areas also serve as waiting zones for visitors who require guidance from staff members.

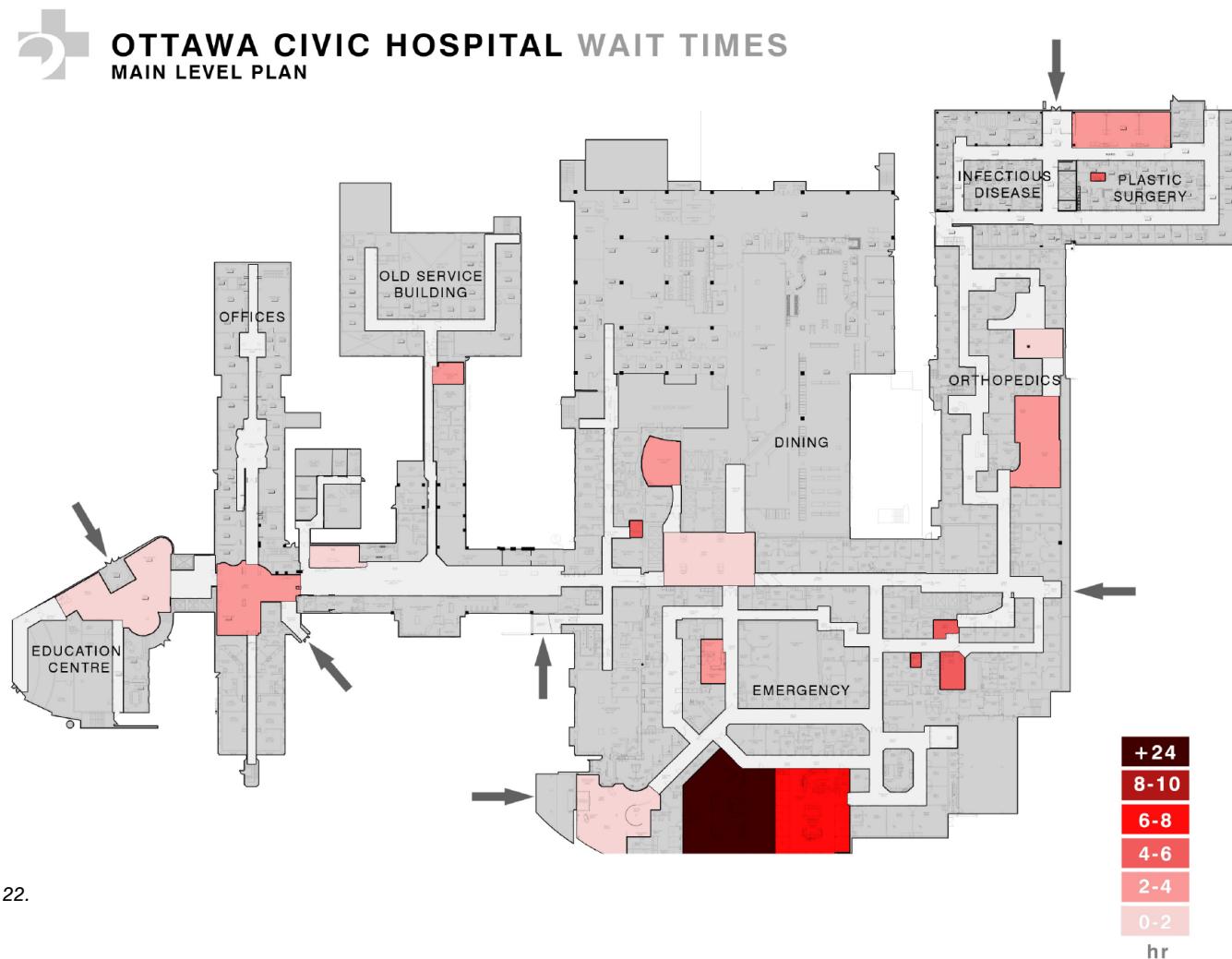
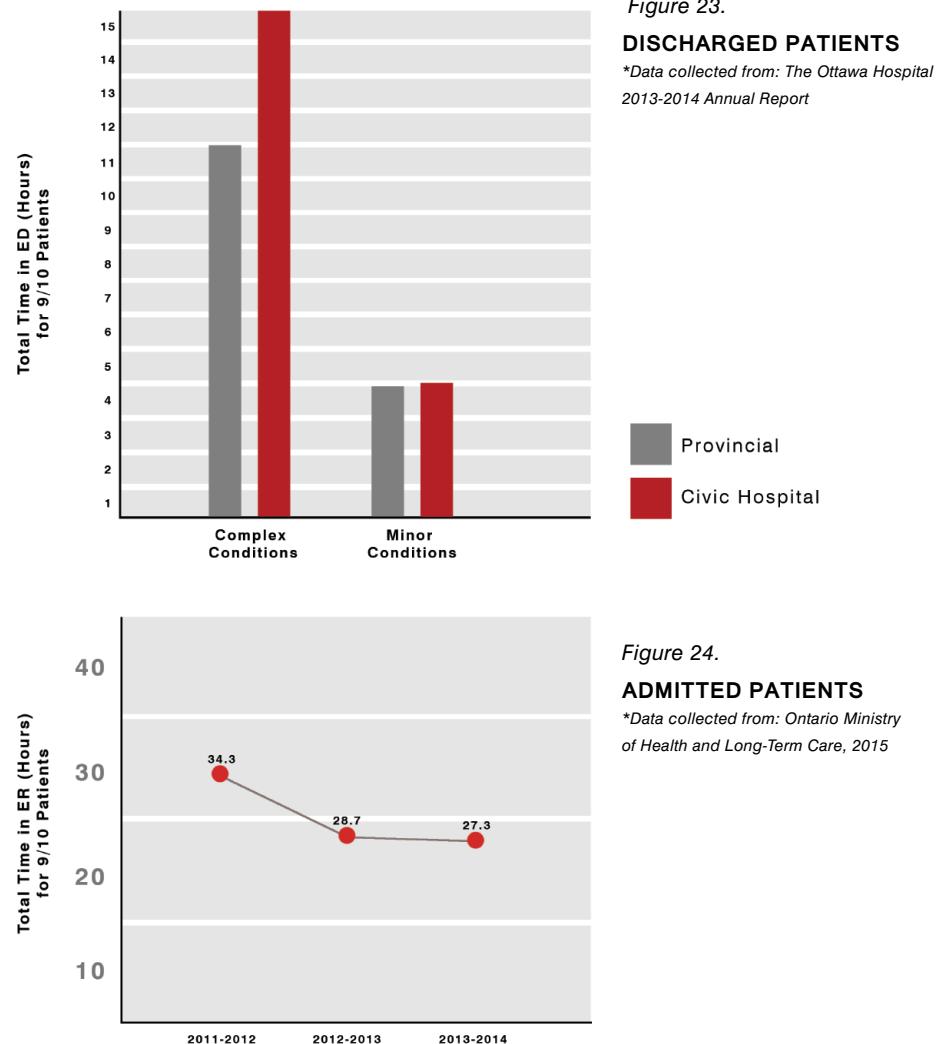


Figure 22.



The adjacent graphs show wait time statistics associated with admitted and discharged patients, specific to the Ottawa Hospital. Figure 23 shows a significant discrepancy between the wait times recorded in the Ottawa Hospital, and wait times across provincial facilities. For discharged patients with complex medical conditions, wait times in the emergency department of the Ottawa Civic Hospital are significantly higher than average provincial wait times.

Figure 24 shows wait time statistics for patients admitted to the emergency department of any of the Ottawa Hospital campuses, from 2011 to 2014. Although wait times have been steadily decreasing over the past few years, admitted patients continue to spend over 24 hours waiting in the ED.

## 2.5 Case Study B:

### IRVING GREENBERG CANCER CENTRE

Location: Queensway Carleton Hospital  
Ottawa, ON, Canada  
Completion: 2010  
Architect: Perkins+Will



Figure 25. Irving Greenberg Family Cancer Centre  
Courtyard View, 2014

The Irving Greenberg Family Cancer Center is a recent project by Perkins+Will, located on the Queensway Carleton Campus. The facility specializes in the treatment of cancer patients, and strives to provide support and accommodation for the patient's family members.<sup>29</sup> Unlike the historic Ottawa Civic Hospital, this centre is well-funded and maintained.

The Cancer Centre has a total of four floors, with a variety of waiting spaces dispersed throughout. The main waiting room is located on the second floor near the entrance, and is designed to provide patients and family members with the comfort of a home setting (*Figure 26*). The first level houses three radiation bunkers, and contains three adjacent waiting zones allocated specifically for radiation patients (*Figure 27*). The fourth level specializes in chemotherapy treatment, and is an area where patients and their accompanying family members spend hours waiting during numerous chemotherapy sessions (*Figure 28*).



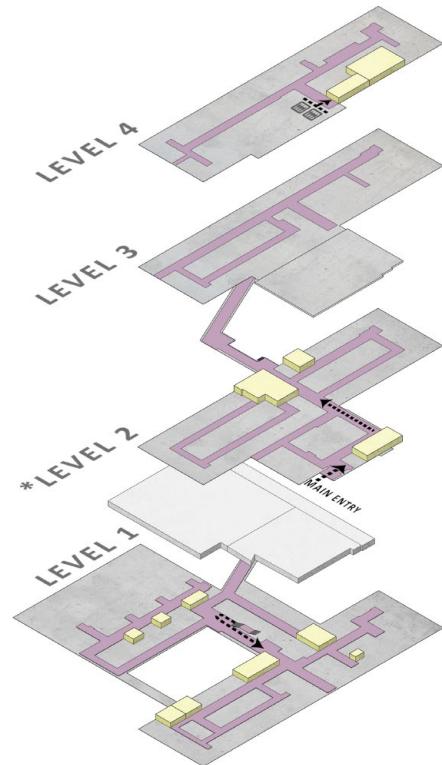
### IRVING GREENBERG FAMILY CANCER CENTRE

*Figure 26 (Top).*  
Level 2 Main Waiting, 2014

*Figure 27 (Bottom Left).*  
Level 1 Radiation Waiting, 2014

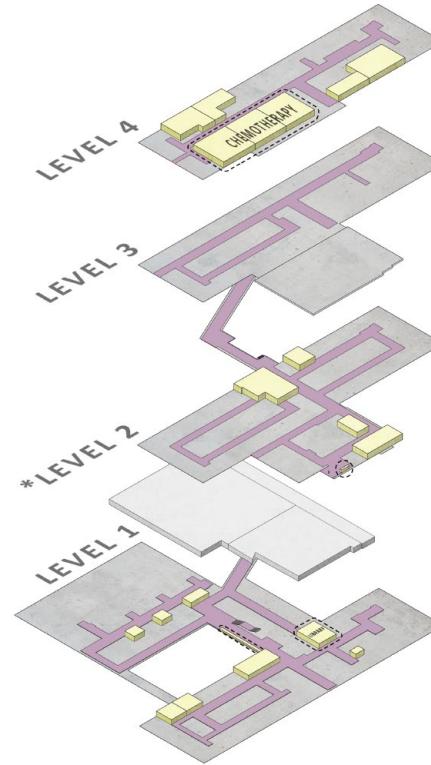
*Figure 28 (Bottom Right).*  
Level 4 Chemotherapy Waiting, 2014

Figure 29. RELATIONSHIP BETWEEN WAITING SPACES & SERVICES



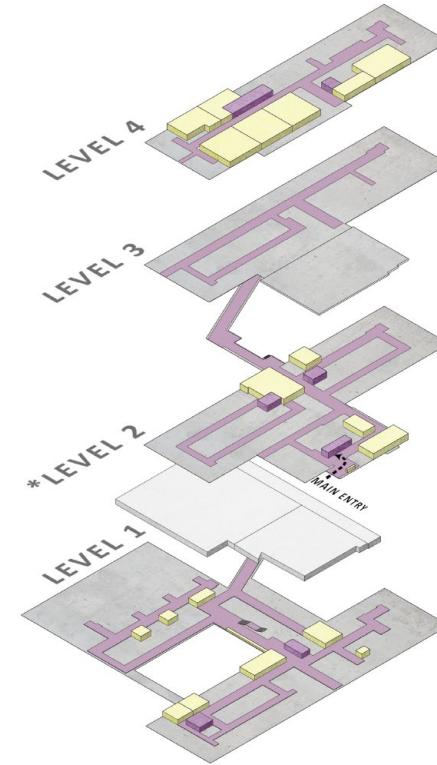
### ► Designated Waiting Areas

Designated and undesignated waiting areas are dispersed throughout the levels, located adjacent to the main circulation. Waiting spaces adjacent to the radiation bunkers are allocated to patients waiting for radiation treatment only. The remaining waiting areas accommodate patients and visitors.



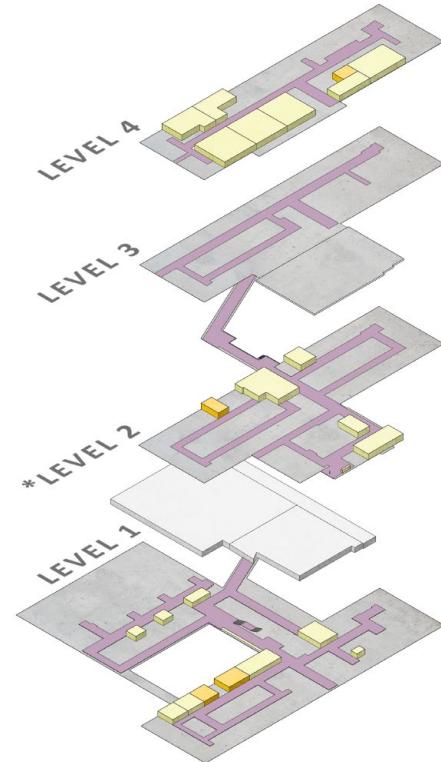
### ► Additional Waiting Areas

All waiting spaces have an open concept that integrates them into the overall design of the building, and does not restrict users within the confines of walls.



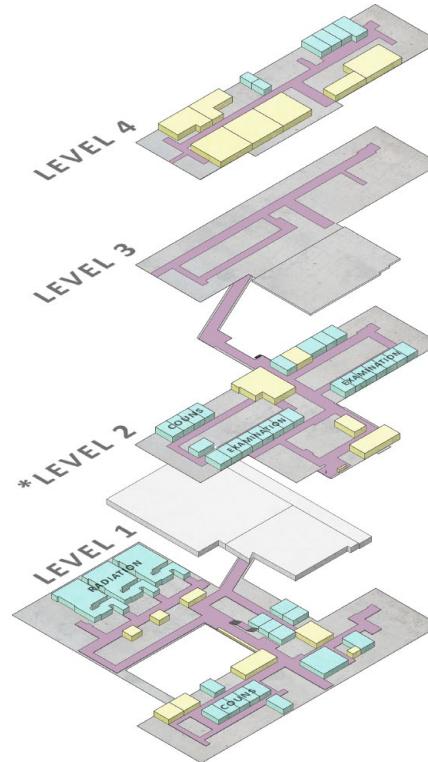
### ► Reception

Public waiting rooms are always located near a reception desk, allowing patients and visitors to seek help and information if needed.



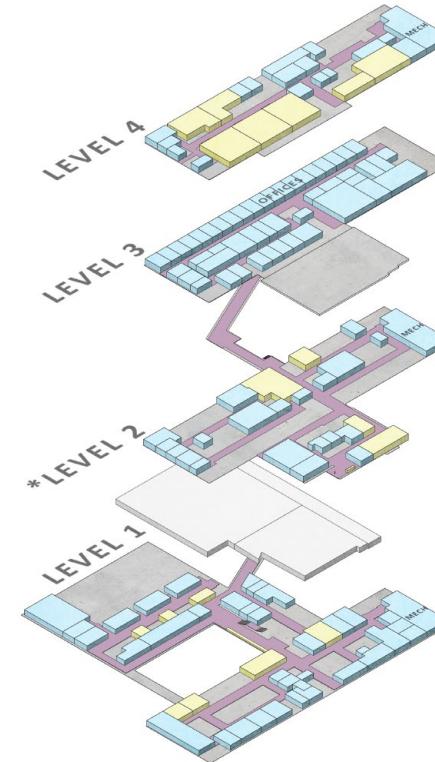
### ► Family Counseling

The Cancer Centre provides four counseling rooms, where family and friends are guided with support and information regarding the patient's illness and care needs. These counseling spaces are located in close proximity to the main public waiting areas.



### ► Patient + Staff

Patients and medical staff interact during the treatment and assessment process in private areas that are separated from the waiting zones.



### ► Staff Only

Level 3 is restricted for staff use only. Staff areas are positioned away from main public and waiting zones. This helps to eliminate distractions in the work place and provides medical staff with a sense of privacy.

### VISUAL CONNECTION TO NATURE

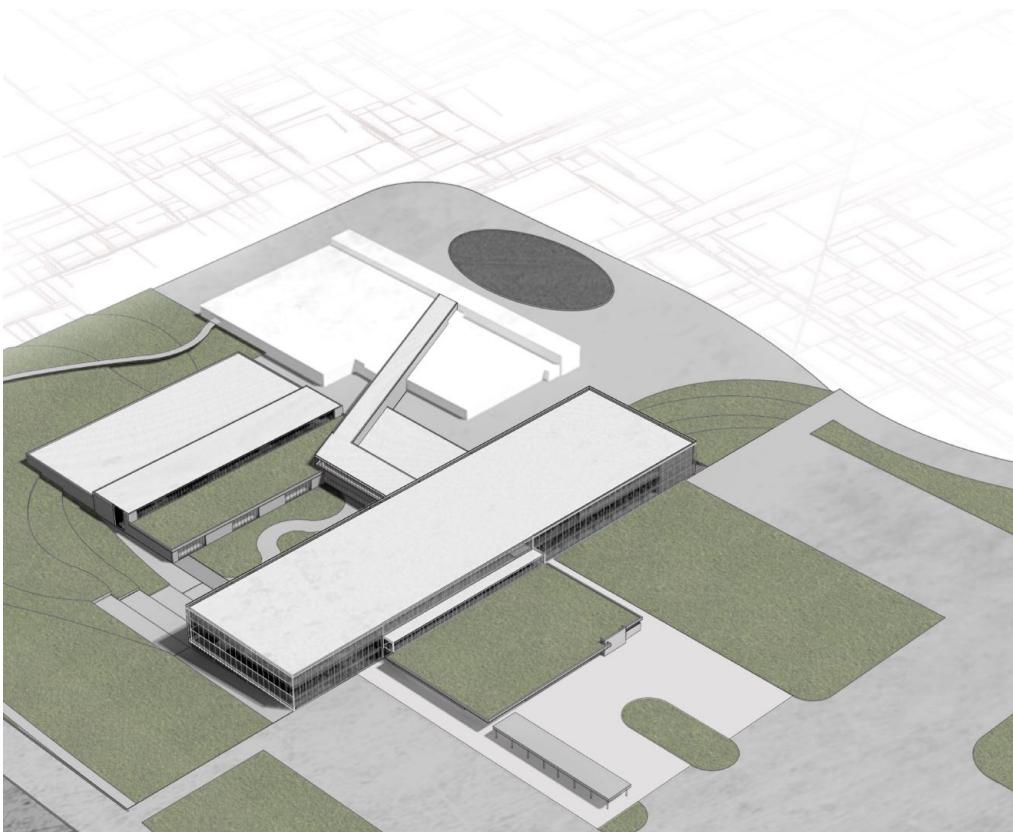


Figure 30. Irving Greenberg Family Cancer Centre, Aerial View

Perkins+Will emphasizes the importance of nature in their design of the Irving Greenberg Family Cancer Centre, by providing patients and visitors with a visual connection to the outdoors. The main-level public waiting room has a direct view to the arrival and departure area outside, symbolizing the anticipation of an end to the patient's illness. Additional semi-private waiting rooms offer occupants with a natural view into the large, central courtyard. The chemotherapy stations on the fourth floor, where patients endure hours of treatment, are situated along the North facade of the building to provide a view to the outside arrival and departure zone, as well as the green roof below (*Figure 31*). Continuous skylights allow natural light to penetrate the main circulation corridors from above.

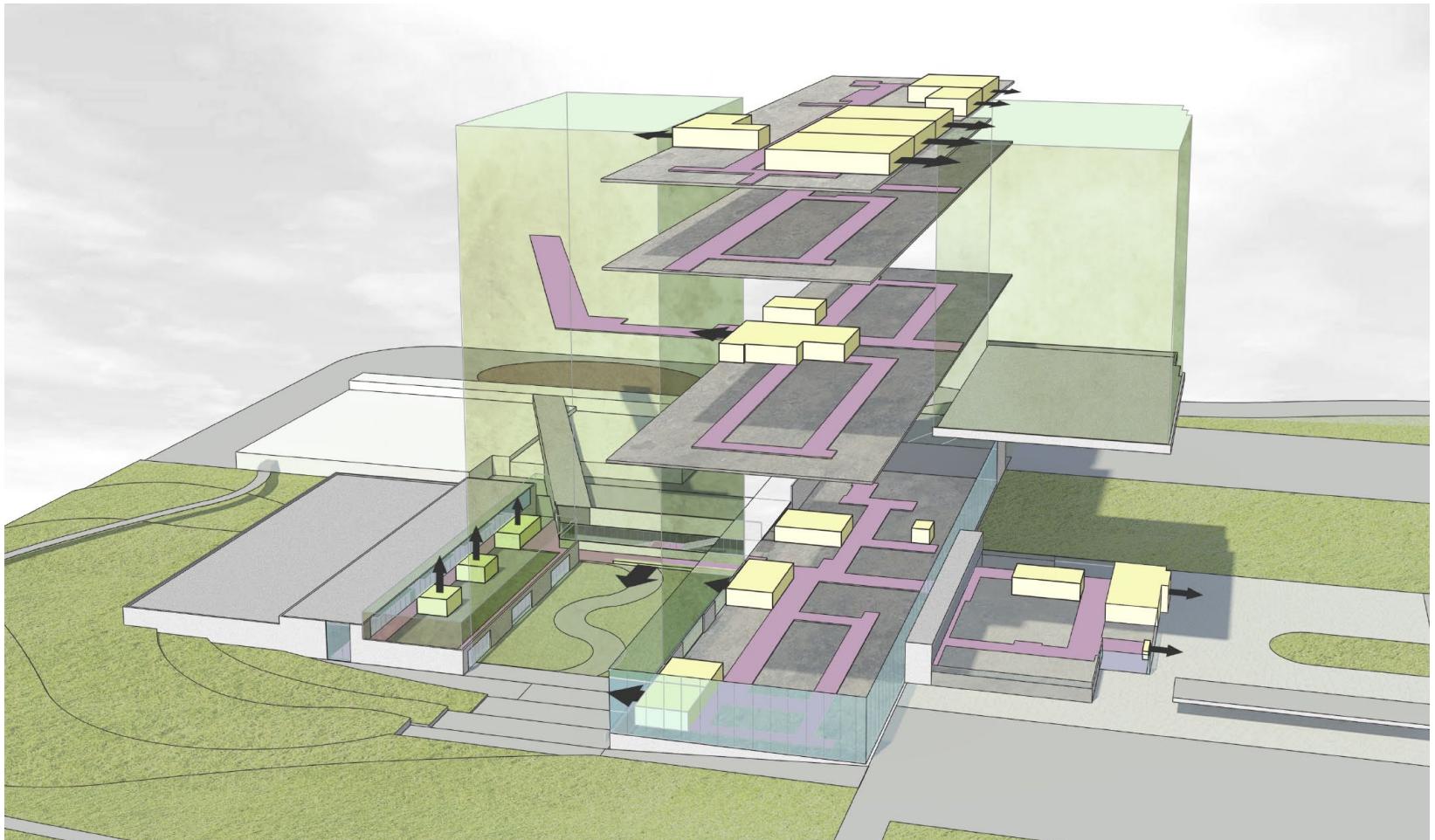


Figure 31. Visual Connection to Outdoor Green Spaces

## 2.6 Design Considerations

Surveys have shown that Canadian citizens wish to receive care and treatment closer to home and their communities, rather than in institutions.<sup>30</sup> Unfortunately, professional assessment and urgent treatment can only be accessed efficiently in specialized, health care institutions.

The Ottawa Civic Hospital is the primary focus of the design proposal outlined in the next chapter. The hospital is categorized as a teaching facility that receives approximately 180-200 emergency department visits per day.<sup>31</sup> In order to address current health care issues, the preceding data analysis and case studies will form the basis for the design project.

Waiting in the emergency department is a multi-step process. Therefore, the design of waiting spaces must generate a cohesive journey for all users. Historical and contemporary examples of health care facilities contain waiting zones that are dispersed throughout the floor plan of a building. Extracting waiting rooms from the core of a structure will provide natural day lighting, fresh air, and a sense of escape.

Emergency departments treat more low-urgency cases than high-urgency cases. Additionally, admitted patients experience much longer wait times than discharged patients. The project design must consider allocating sufficient floor area to zones that accommodate admitted, low-urgency patients.

Large volumes of patients arrive to the emergency department in the morning hours. Design features that are prominent during the day time, such as natural shadows, outdoor public areas, and greenscapes, will ease the patient's anxiety upon arrival and attract community residents to the area. Waiting zones that promote community involvement, provide opportunities for escape, and integrate patients and visitors in the health care process, can transform wait times into productive, rather than wasteful, activities.

## Chapter Notes

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- <sup>1</sup> Ronald May. "Effects of Waiting for Clinical Services on Attrition, Problem Resolution, Satisfaction, Attitudes toward Psychotherapy, and Treatment Outcome: A Review of the Literature." *Professional Psychology: Research and Practice*, 22 (1991): 209-214. 2 Carleton University Library. Web. Oct. 2014.
- <sup>2</sup> Gatchel, Robert J., and Andrew Baum. *An Introduction to Health Psychology*. Massachusetts: Addison-Wesley Publishing Company, 1983. Print. p. 264.
- <sup>3</sup> Ibid., p. 5.
- <sup>4</sup> Armstrong, Pat, and Hugh Armstrong. *Wasting Away: the Undermining of Canadian Health Care*. New York: Oxford UP, 2010. Print. p. 18.
- <sup>5</sup> Yoon, JungKyo, and Marieke Sonneveld. "Anxiety of Patients in the Waiting Room of the Emergency Department." *TEI '10 Conference*, 279-286. Carleton University Library. Web. Oct. 2014.
- <sup>6</sup> Gatchel, Robert J., and Andrew Baum. *An Introduction to Health Psychology*. Massachusetts: Addison-Wesley Publishing Company, 1983. Print. p. 51.
- <sup>7</sup> Ibid., p. 41.
- <sup>8</sup> Yoon, JungKyo, and Marieke Sonneveld. "Anxiety of Patients in the Waiting Room of the Emergency Department." *TEI '10 Conference*, 279-286. Carleton University Library. Web. Oct. 2014.
- <sup>9</sup> Rubin, Jeffrey Z., and Joel Brockner. "Factors Affecting Entrapment in Waiting Situations: The Rosencrantz and Guildenstern Effect." *Journal of Personality and Social Psychology*, 31 (1975): 1054-1063. Carleton University Library. Web. Oct. 2014.
- <sup>10</sup> Gatchel, Robert J., and Andrew Baum. *An Introduction to Health Psychology*. Massachusetts: Addison-Wesley Publishing Company, 1983. Print. p. 68.
- <sup>11</sup> Ibid., p. 109.
- <sup>12</sup> Ibid., p. 59.
- <sup>13</sup> Yoon, JungKyo, and Marieke Sonneveld. "Anxiety of Patients in the Waiting Room of the Emergency Department." *TEI '10 Conference*, 279-286. Carleton University Library. Web. Oct. 2014.
- <sup>14</sup> Gatchel, Robert J., and Andrew Baum. *An Introduction to Health Psychology*. Massachusetts: Addison-Wesley Publishing Company, 1983. Print. p. 63.

## Chapter Notes

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<sup>15</sup> Kjellgren, Anette, and Hanne Buhrkall. "Comparison of the Restorative Effect of a Natural Environment with that of a Simulated Natural Environment." *Journal of Environmental Psychology*, 30 (2010): 464-472. Carleton University Library. Web. Oct. 2014.

<sup>16</sup> Gatchel, Robert J., and Andrew Baum. *An Introduction to Health Psychology*. Massachusetts: Addison-Wesley Publishing Company, 1983. Print. p. 79.

<sup>17</sup> Kjellgren, Anette, and Hanne Buhrkall. "Comparison of the Restorative Effect of a Natural Environment with that of a Simulated Natural Environment." *Journal of Environmental Psychology*, 30 (2010): 464-472. Carleton University Library. Web. Oct. 2014.

<sup>18</sup> Pallasmaa, Juhani. *The Eyes of the Skin: Architecture and the Senses*. New Jersey: Wiley-Academy, 2005. Print. p. 34.

<sup>19</sup> Canadian Institute for Health Information. "Health Care in Canada, 2012: A Focus on Wait Times." Ottawa: CIHI, 2012. Web. Sept. 2014. p. xiv.

<sup>20</sup> Canadian Institute for Health Information. "Understanding Emergency Department Wait Times." Ottawa: CIHI, 2005. Web. Sept. 2014. p. 32.

<sup>21</sup> Canadian Institute for Health Information. "Health Care in Canada, 2012: A Focus on Wait Times." Ottawa: CIHI, 2012. Web. Sept. 2014. p. 27.

<sup>22</sup> Canadian Institute for Health Information. "Understanding Emergency Department Wait Times." Ottawa: CIHI, 2005. Web. Sept. 2014.

<sup>23</sup> Ibid., p. 3.

<sup>24</sup> Canadian Institute for Health Information. "Health Care in Canada, 2012: A Focus on Wait Times." Ottawa: CIHI, 2012. Web. Sept. 2014. p. 31.

<sup>25</sup> Ibid., p. 29

<sup>26</sup> Ibid., p. 30.

<sup>27</sup> "Our History: Heritage Hospitals (pre-dating the Ottawa Hospital)." Web. November 2014.

<sup>28</sup> Canadian Institute for Health Information. "Understanding Emergency Department Wait Times." Ottawa: CIHI, 2005. Web. Sept. 2014. p. 18.

<sup>29</sup> Author Unknown. "Queensway Carleton Hospital Completes Family Cancer Centre: 1,300 More Patients Each Year to Receive Treatment." *Ontario Newsroom*, January 2010. Web. January 2015.

<sup>30</sup> Armstrong, Pat, and Hugh Armstrong. *Wasting Away*. New York: Oxford University Press, 2010. Print. p. 2.

<sup>31</sup> The Ottawa Hospital. "Emergency Department." Ottawa: The Ottawa Hospital, 2014. Web. Jan. 2015.

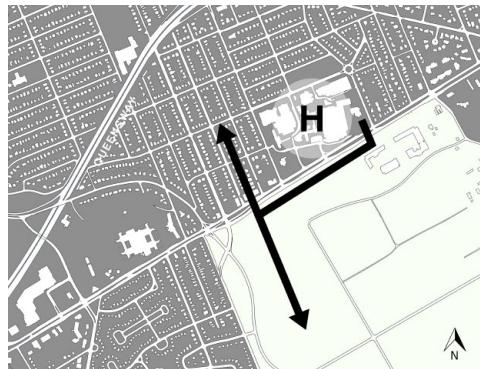
# 03

## PROJECT DESIGN



Figure 32. Introduction of a Restorative Environment

*The “waiting room” of the emergency department in modern Canadian health care facilities should be eliminated and replaced with interconnected zones of activity that promote the physical and emotional well-being of all occupants, increase productivity, and facilitate the treatment process.*



### 3.1 Design Objectives

There is an urgency to transform waiting rooms and waiting zones in modern health care facilities into restorative environments that promote the health and well-being of their occupants. Time spent waiting is not only an issue of economic liability, but is a detrimental factor that affects the efficiency and service quality of the overall health care organization. Waiting areas, or buffer zones, in the emergency department should be eliminated and replaced with zones of activity that provide occupants with the opportunity to manage the passage of time in a personalized and purposeful manner. The following project proposes a series of interconnected “activity” zones that consider social, safety, and natural elements in their design in order to relieve psychological and physical distress associated with waiting.

Patients are often unable to relay all information concerning their medical needs to staff members in an effective manner.<sup>1</sup> Health issues may remain undetected and untreated, eventually leading to a decline in mental and physical health. A primary incentive of the project proposal is to address social engagement among patients and staff members in the “waiting rooms” of emergency departments. A range of private, semi-private, and public zones will be allocated according to the patients’ medical urgency, in order to promote safety and decrease the risk of infection. Patients will also be allowed to partially control their social and physical environments according to their needs. Hospital services will be easily accessible to all occupants. Providing information and educating clients on the treatment process will alleviate fears and increase their optimism for a successful outcome.

## 3.2 Site Analysis

### CENTRAL EXPERIMENTAL FARM

Location: Ottawa, ON, Canada  
Established: 1886  
Total Size: 1,055 Acres of Open Space



Figure 33. Central Experimental Farm, 2014

The site proposed for the following design project is situated on the Central Experimental Farm (CEF), in Canada's capital city of Ottawa. In November of 2014, Ottawa Hospital officials announced that 60 acres of the farm's federal land will be allocated for the construction of a new Civic Campus (*Figure 34*).<sup>2</sup> The incentive to relocate the campus, which is expected to take place over the next decade, is to accommodate an aging population as well as patients from the overcrowded existing hospital.<sup>3</sup> The portion of reserved land is situated across the street from the existing Ottawa Civic Hospital. The Arboretum and Rideau Canal are located on the East side of the site, providing community residents with a getaway from surrounding urban activity.

- **Two Primary Functions:** 1) *National Historic Site*  
2) *Research Landscape*

**Other Uses:** *Experimental Purposes*  
*Working Farm*  
*Headquarters of Agriculture*  
*Public Attractions*

## OTTAWA CENTRAL EXPERIMENTAL FARM

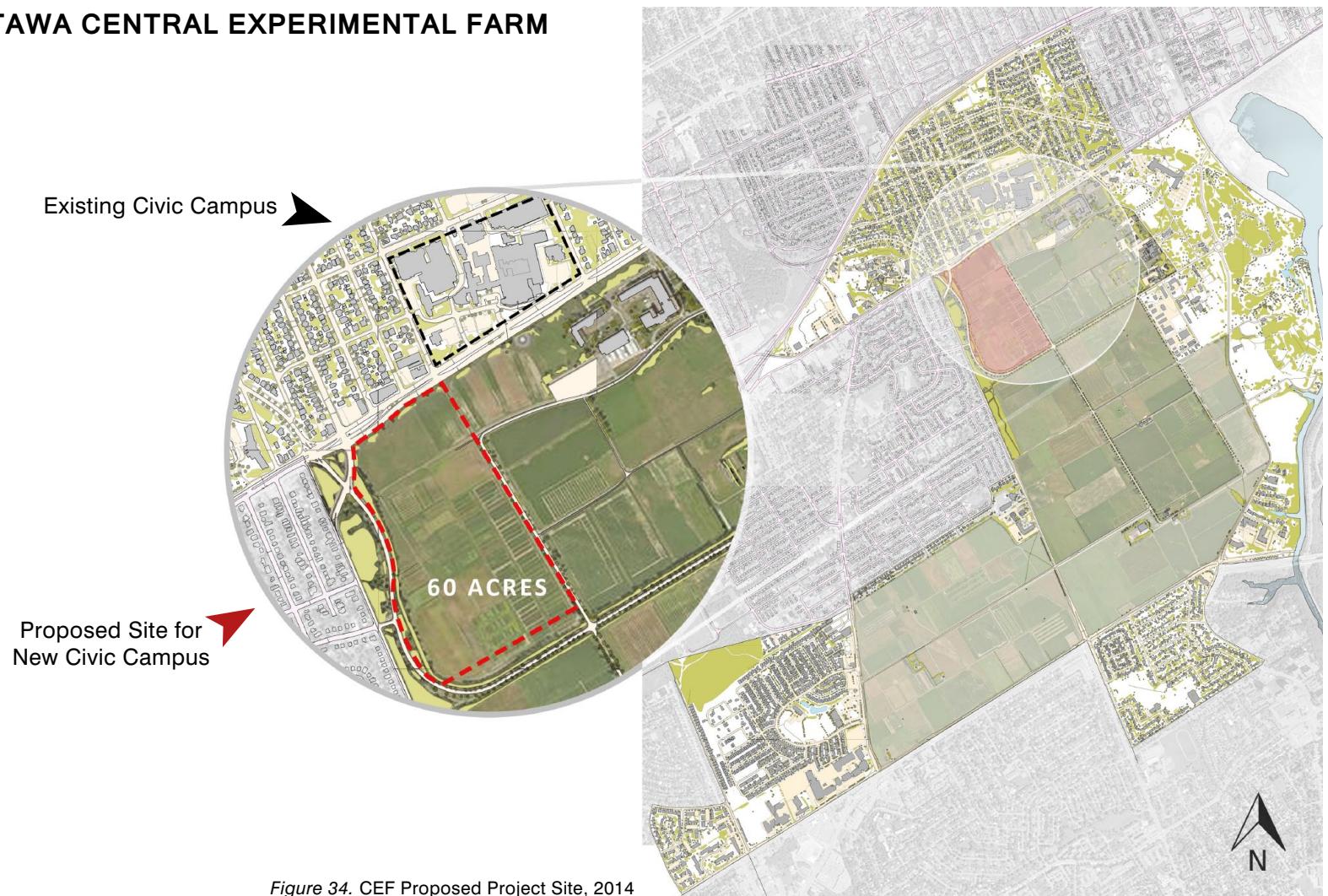


Figure 34. CEF Proposed Project Site, 2014

### A Brief History

Originally with five locations across the country, the CEF functioned as a network of research centres for the Federal Department of Agriculture. Its primary aim was to promote Canadian growth and address production issues. With the arrival of the 20<sup>th</sup> century, the land was segregated into research divisions, and the number of research facilities on it tripled. By the 1960's, the farm's land was simply divided into an office building complex and a research complex.<sup>4</sup> Today, the CEF has expanded to a total of 19 sites across the country. Canada is the only country that operates a farm within its capital city.

Since its founding, the CEF has retained its physical appearance and functionality as a national historic site and active research centre (*Figure 35*). However, the surrounding rural landscape that was present during the 19<sup>th</sup> century has now transformed into an urban city centre.<sup>5</sup> The farm land still evokes a sense of its rural past and prairie life. It not only serves as the headquarters of agriculture in Ottawa, but promotes community involvement

by offering public attractions and operating on volunteer groups. The *CEF Management Plan* outlines the primary objectives of the farm to help ensure its future sustainability and preservation. Some of these objectives are to preserve the land's cultural and historical significance, to establish clear points of access, to improve circulation within the site, and to create a link with the surrounding urban context.<sup>6</sup>



Figure 35. CEF Past & Present



## CENTRAL EXPERIMENTAL FARM TODAY

*Figure 36 (Left). CEF & Ottawa Civic Hospital, 2014*

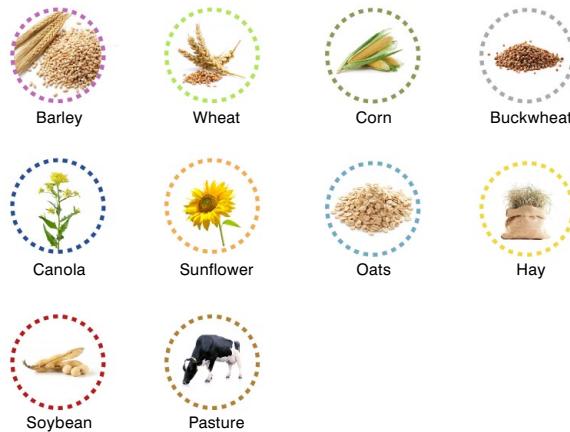
*\*Source: Google Maps*

*Figure 37 (Below). CEF as seen from Carling Ave, 2014*



## OTTAWA CENTRAL EXPERIMENTAL FARM

### Field Crops



The CEF produces a variety of crops in the summer and winter seasons. Corn, soybean, and wheat fields cover the vast majority of the farmland designated for the future Ottawa Civic Hospital. Open lands and pastures with grazing animals are visible further in the distance.



Figure 38. CEF Field Crops, 2012

### Civic Hospital-Central Park Neighbourhood

Ottawa is subdivided into a total of 107 neighbourhoods. The Central Experimental Farm is located in the Civic Hospital-Central Park (CH-CP) neighbourhood. The following data has been collected from the Ottawa Neighbourhood Study project, which examines factors that affect the health and social characteristics of any given neighbourhood. Additional information has been gathered from the Maps, Data, and Government Information Centre (MADGIC). Neighbourhood demographics and site conditions are compared to city averages, and subsequently used to identify current neighbourhood issues that inform the design of the proposed project.



Figure 39. CH-CP Neighbourhood

Name of Infrastructure	CH-CP Neighbourhood	City Average
<b>TOTAL POPULATION</b>	9,845	734, 070
<b>AGE GROUPS</b>		
% Aged 0 to 19 years	18.9	23.4
% Aged 20 to 39 years	29.1	27.8
% Aged >60	23	18.9
<b>WALKABILITY (score out of 100)</b>	48	50
<b>PEDESTRIAN AMENITIES (score out of 100)</b>	57	50.1
<b>NUMBER OF COMMUNITY GARDENS IN NEIGHBOURHOOD</b>	0	0.3
<b>TYPES OF HOUSEHOLDS</b>		
% of single-detached houses	36	42.9
% of high-rise apartment	32	18.5
% row house	17.6	20.6
Number of social and affordable housing units	153	229.4
<b>MODE OF TRANSPORTATION</b>		
% Driver in a car, truck or van	58.2	60.3
% Use public transit	21.2	22.5
% Walk	7.2	7.2
% Bicycle	4.9	2.5
<b>ED VISITS (all ages, per 100,000)</b>	7054.2	7361.8

Figure 40. CH-CP Ottawa Neighbourhood Study Statistics, 2015



The adjacent map indicates major health care facilities in Ottawa. The four campuses that make up the Ottawa Hospital include the Civic Campus, the General Campus, the Irving Greenberg Family Cancer Centre, and the Riverside Campus. Community gardens, which will be a dominant element in the proposed project, are currently situated away from these primary medical facilities.

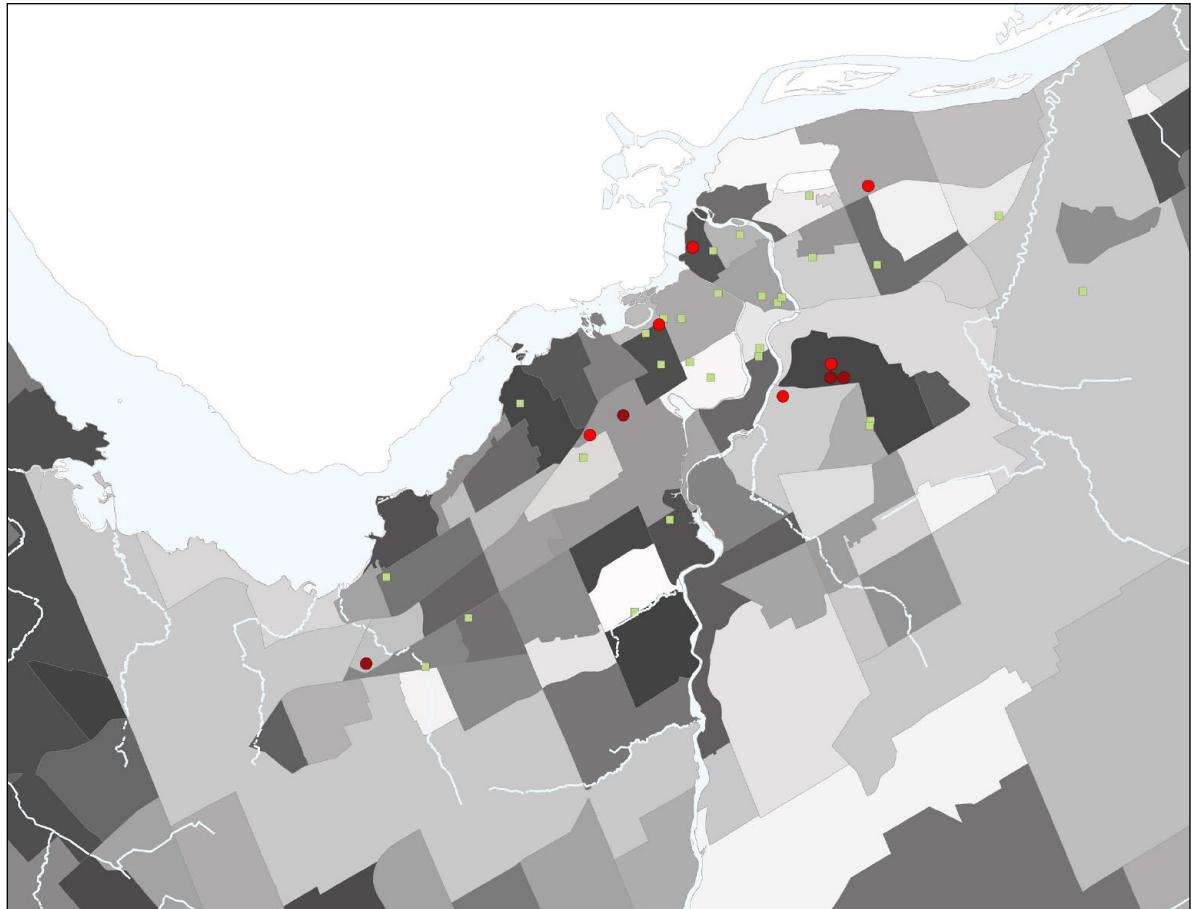
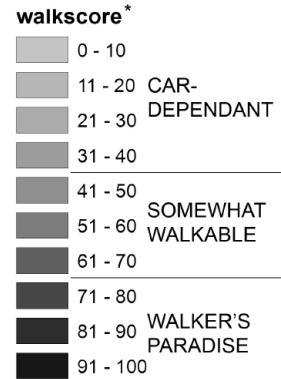


Figure 41. Hospitals & Community Gardens Map, Ottawa



A walkable neighbourhood contributes to the health and well-being of its inhabitants by providing accessible pedestrian routes, bike trails, open spaces, access to buildings, sheltered transit stops, and activities that increase social interaction.<sup>7</sup> Walkability is a factor of several elements, including the population density of the area, the diversity of nearby facilities, and the design of the land and its infrastructures. The CEF is located West of Ottawa's downtown area, and is in a somewhat walkable zone.

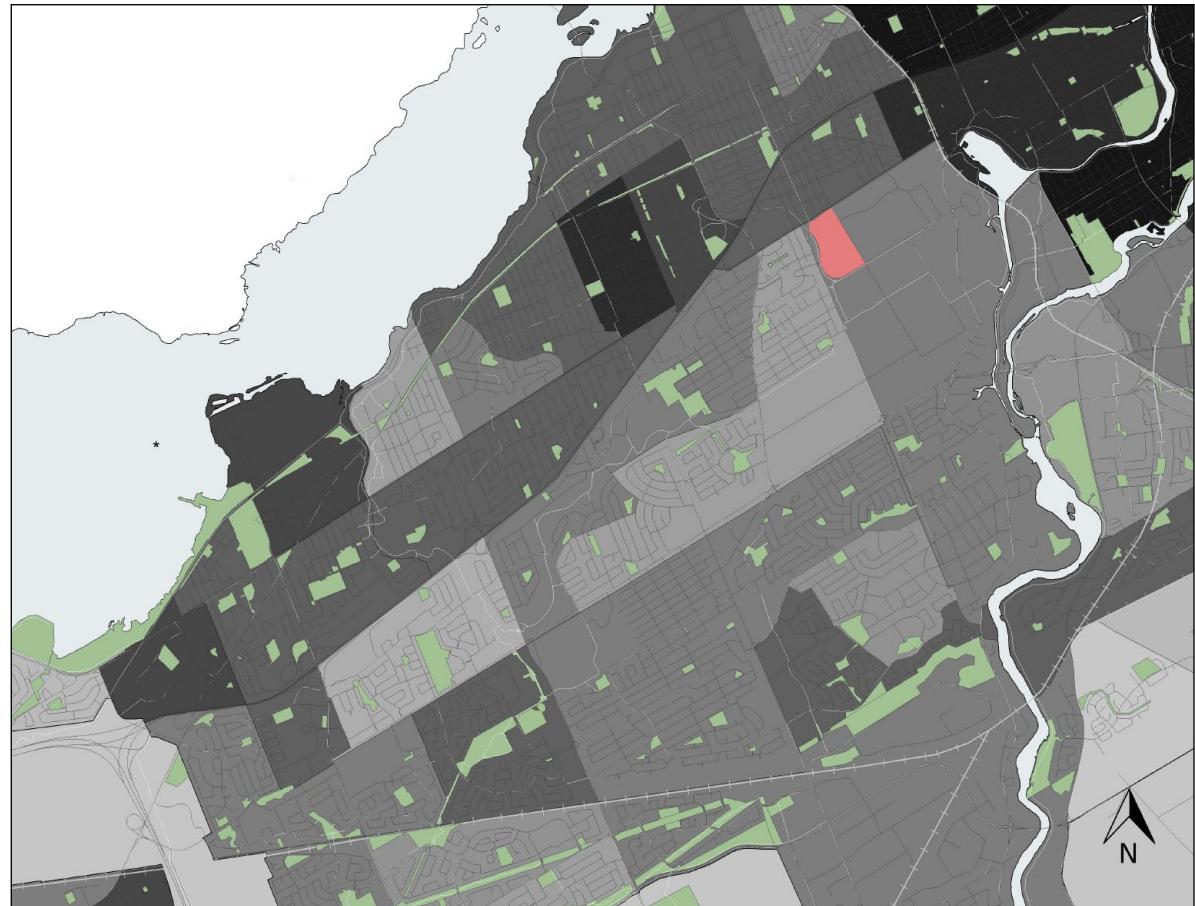


Figure 42. Walkability Map, Ottawa

CITY OF OTTAWA:  
**CIVIC HOSPITAL - CENTRAL  
PARK NEIGHBOURHOOD**

**COMMERCIAL VS. RESIDENTIAL**

- Commercial Buildings
- Health Care Facilities
- Residential Buildings
- Apartment Buildings
- Central Experimental Farm
- Recreation & Open Space

The existing Civic Hospital and proposed project site are situated in a primarily residential area, with a few commercial buildings located along the primary vehicular routes. The only structures located directly on the CEF are Agriculture and Agri-Food Canada facilities, and buildings owned by Natural Resources Canada.

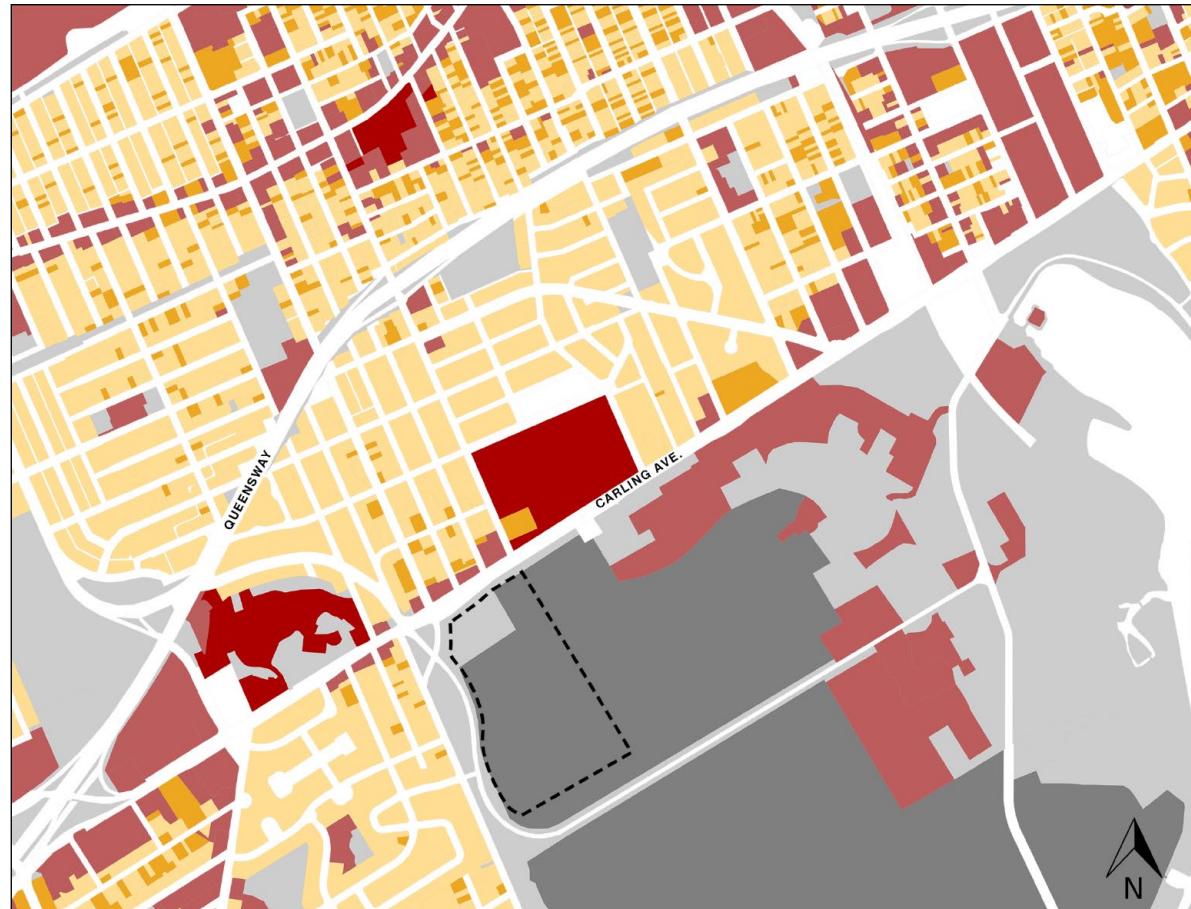
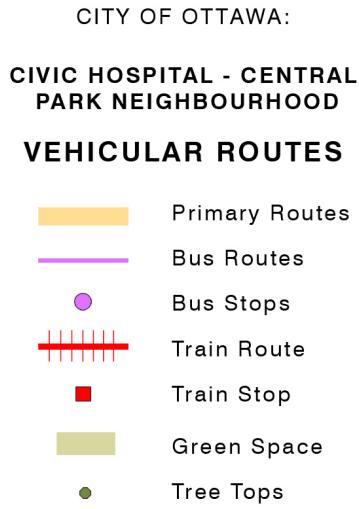


Figure 43. Commercial & Residential Buildings Map, CH-CP Neighbourhood



The neighbourhood relies heavily on vehicular transportation. The Queensway and Carling Avenue serve as primary vehicular routes to the surrounding residential area. The site can also be accessed by means of several bus routes, and the O-Train line that stops along Carling Avenue.

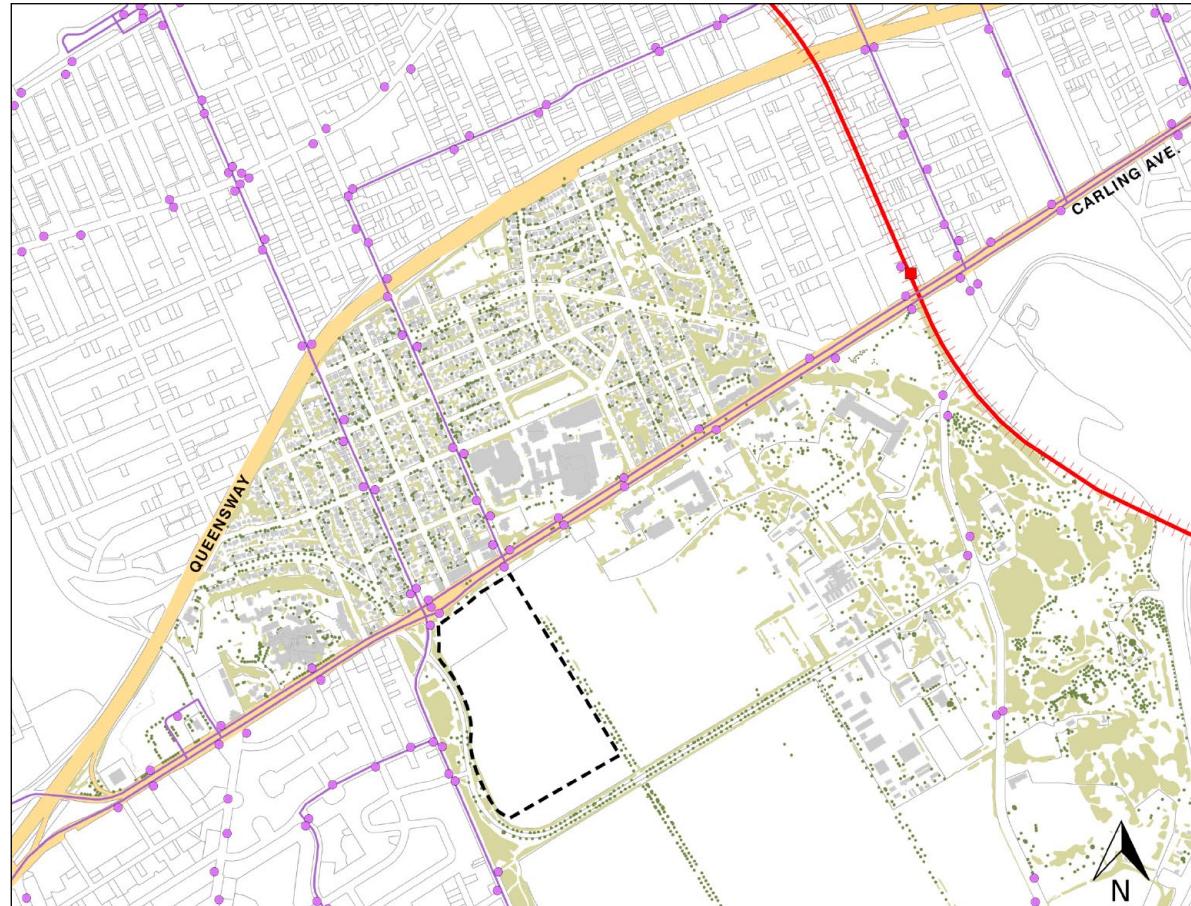


Figure 44. Primary Vehicular Routes Map, CH-CP Neighbourhood

## NEARBY FACILITIES

- H** - Ottawa Civic Hospital
- 1** - Westgate Shopping Centre
- 2** - Royal Ottawa Mental Health Centre
- 3** - Research Branch for Agriculture



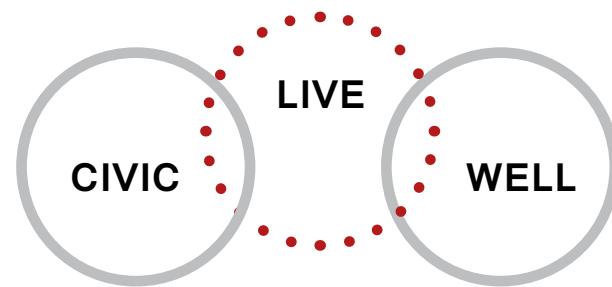
Figure 45. Nearby Facilities Map, Ottawa Civic Hospital & CEF

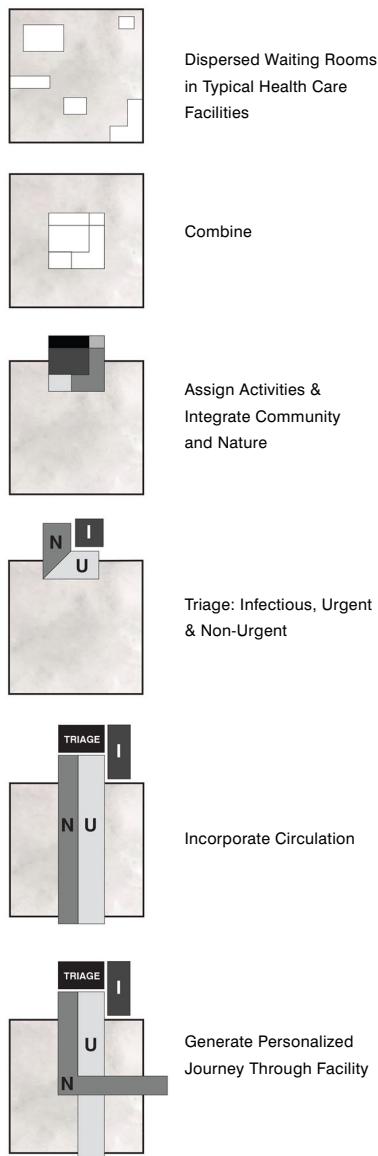
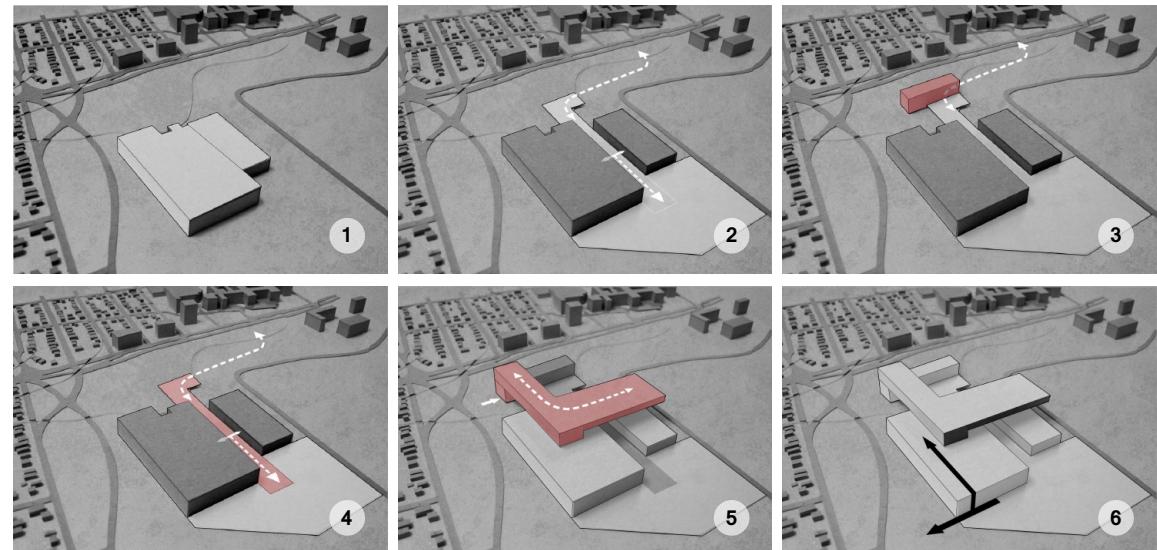
### 3.3 Design Strategies

Contemporary waiting areas are dispersed throughout a health care facility. Often, their sole purpose is to provide the patients and visitors with a space to “wait.” The design project proposes to combine all waiting areas into one zone. Transitioning these buffer areas into one section of the facility will not only diminish confusion and frustration among visitors, but will also allow staff members to easily monitor and treat all patients. The act of waiting will be replaced with “activity zones” that integrate the community and the natural environment into their infrastructures. Activity zones will serve the patient’s needs according to degree of medical urgency. Urgent and non-urgent cases will be physically separated from the infectious cases. A triage unit will serve to administer an initial assessment of the patient’s medical urgency. The proposed activity zones will be incorporated into the main circulation of the health care facility, generating a unique journey for each patient and visitor.

The proposed **OTTAWA CIVELL CENTRE** aims to promote the physical and mental health of emergency department visitors, while preserving the functionality of the landscape as

a historic site and a research landscape. The project will act as a new form of identity for the Central Experimental Farm that strengthens its coherence, improves walking conditions, and attracts community residents to the area. The project will be built prior to the construction phase of the new Civic Campus, and will serve as a community spot and a research site for agriculture. Once construction of the new hospital is underway, the Civell Centre will begin accommodating patients from the existing Civic Campus. The structure will replace the role of the waiting rooms in the new hospital’s emergency department, and also act as a gateway into the hospital and into the site.



**Figure 46.** Design Strategy Parti**Figure 47.** Massing Parti

**1** Future Ottawa Civic Hospital Campus on CEF

**2** Create access to existing Civic Campus, new Civic Campus, and farmland

**3** Triage: urgent, non-urgent, and infectious units

**4** Urgent Unit: create direct access to medical care

**5** Non-Urgent: design for extended stays  
Infectious: isolation as prevention strategy

**6** Discharge back into community

### 3.4 Program



Figure 48. Proposed Ottawa Civell Centre

The **Ottawa Civell Centre** incorporates the following main elements into its design:

- ▶ Points of Arrival
- ▶ Triage
- ▶ Infectious Unit
- ▶ Urgent Unit
- ▶ Non-Urgent Unit
- ▶ Public Space



Figure 49. Ottawa Civell Centre on CEF

 **Points of Arrival****PEDESTRIAN**

A pedestrian path connects the facility to the urban front. The path is positioned on a slightly angled axis to create a physical and symbolic relationship between the existing and future campuses of the Civic Hospital. The path leads visitors to a wide entry plaza, where the ground elevates to become the supporting wall of the triage unit. A cantilevered hydroponics garden is suspended over the main entry, and provides an element of intrigue and fascination to help draw patients and visitors into the facility.

**VEHICULAR**

Visitors arriving by car have direct access to the facility from Carling Avenue. A ramp, located at the entry to the site, leads drivers to an underground parking garage. Elevators in the garage allow visitors to ascend to the main lobby of the facility.

**AMBULANCE**

Arrival by ambulance accounts for 12% of all emergency department visits.<sup>8</sup> The design of ambulance lanes and unloading zones is crucial in delivering patients safely and efficiently. The proposed design incorporates a special emergency lane, with separate arrival and departure zones. The entry to the ambulance lane is located along Carling Avenue, but is separated from the entry plaza by a large green park. This design strategy physically disconnects the commotion and noise associated with emergency arrival from the main point of entry into the building. The ambulance drop-off zone is concealed underneath the cascading roof-top garden of the adjacent infectious unit. Two wide lanes allow simultaneous arrival of multiple vehicles. The ambulance departure zone is located on the other side of the underpass, with a connection back to Carling Avenue.

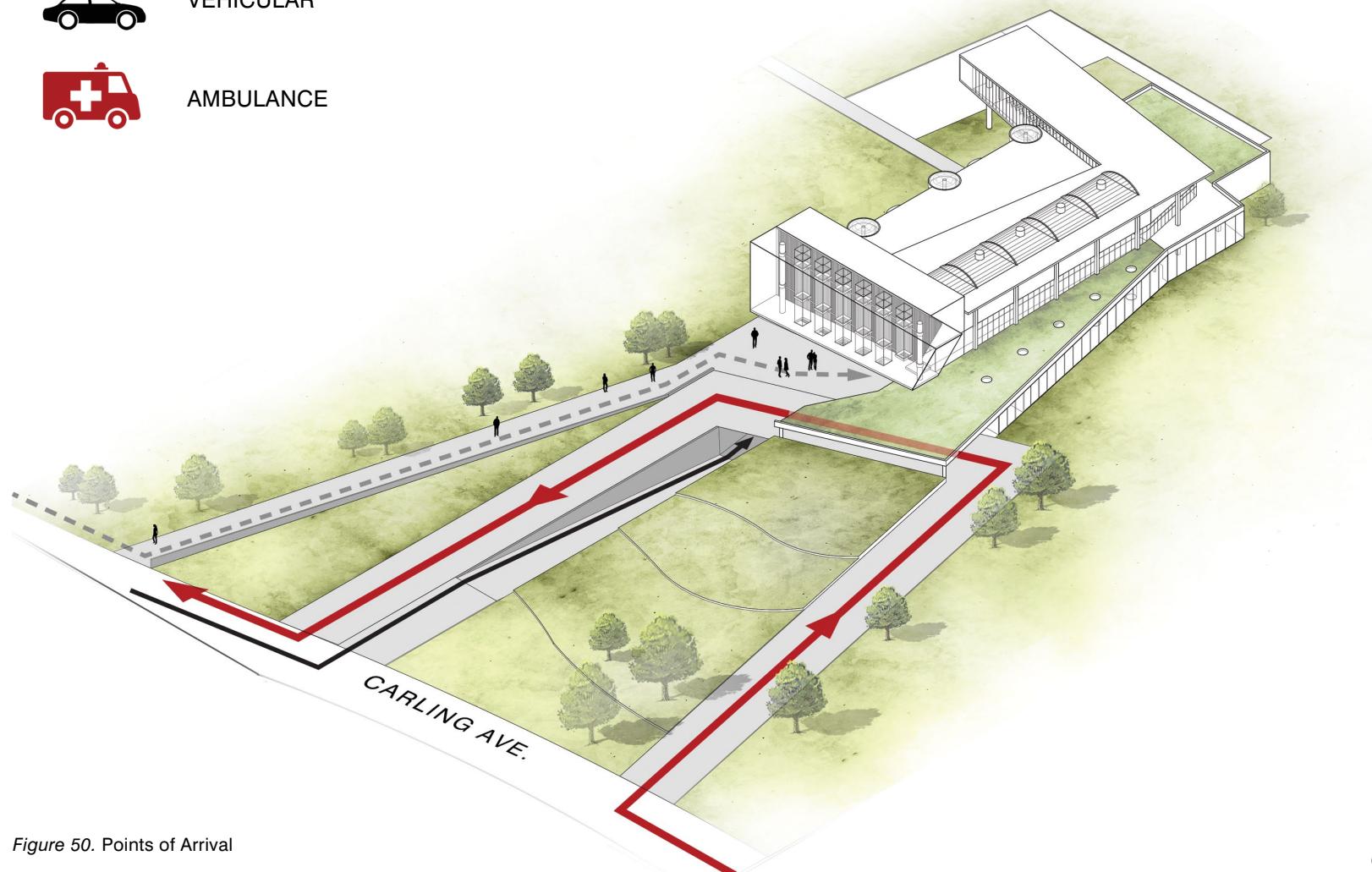
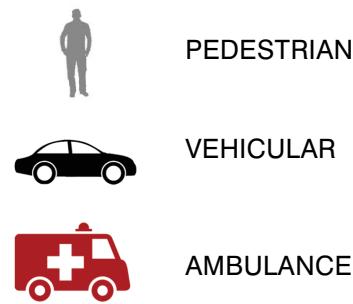


Figure 50. Points of Arrival

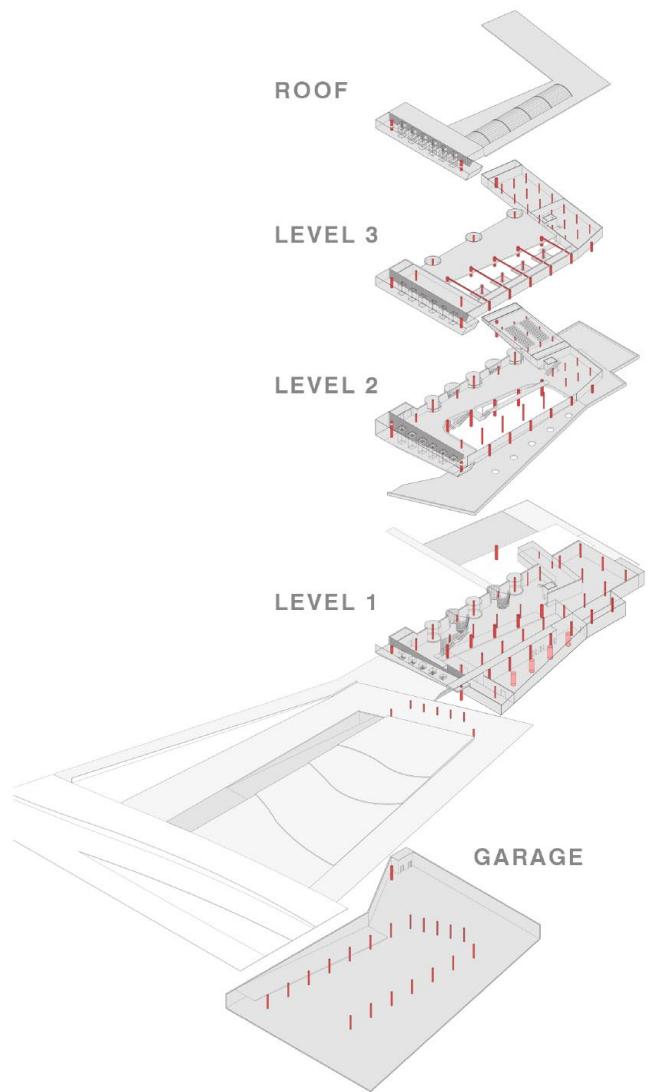


Figure 51. Structural Axonometric

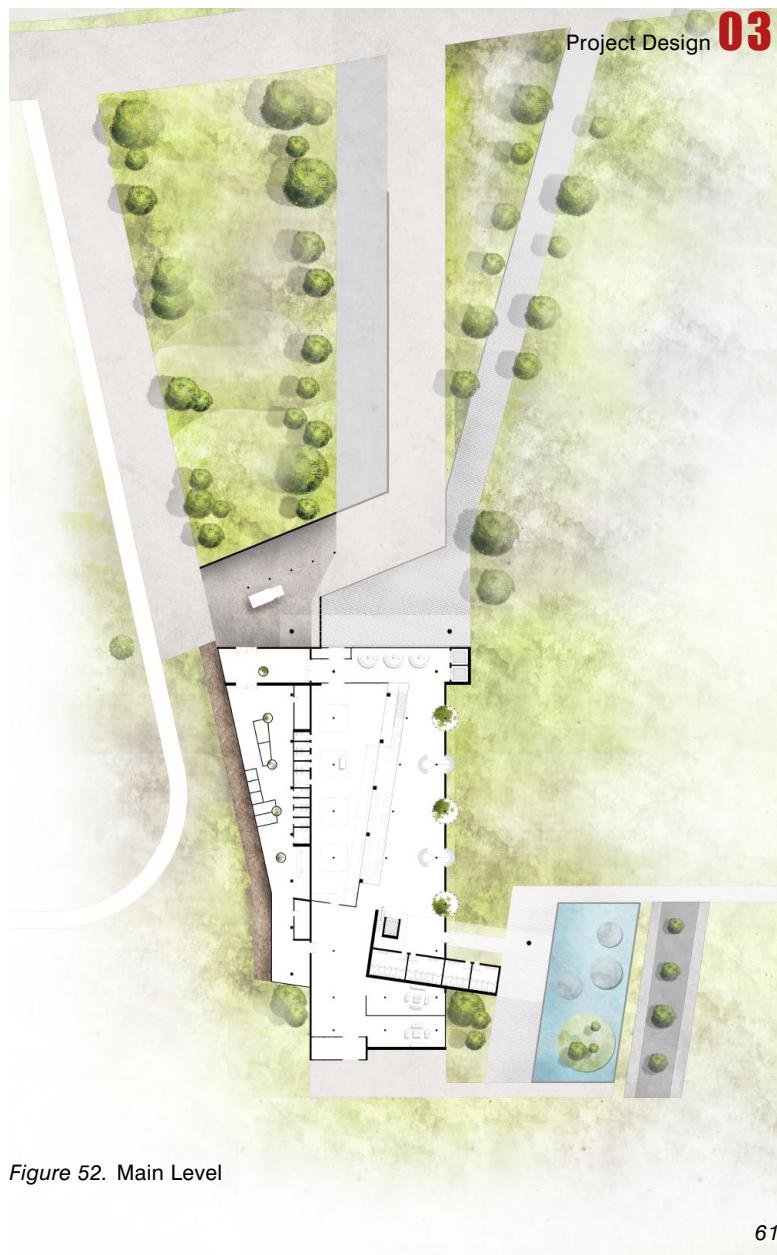


Figure 52. Main Level

## ► Triage

The triage unit is the main entry point into the building. An emergency room triage serves to assess medical urgency by evaluating patients' body temperature, pulse, and blood pressure.<sup>9</sup>

The Civell Centre's triage consists of a cantilevered hydroponic garden and a nurse station. The two design components of this unit are separated by a metal screen, which extends from the ground level to the top floor. The screen is composed of regularly-spaced vertical strips that control the level of revelation into the building's interior at different points of entry. From far away, and when approaching the building from Carling Avenue, the angle of the metal strips inhibits visibility into the structure's interior. At a closer proximity to the main entry, the metal strips align at right angles with the visitor's line of sight to allow slight revelation of the facility's internal structure.

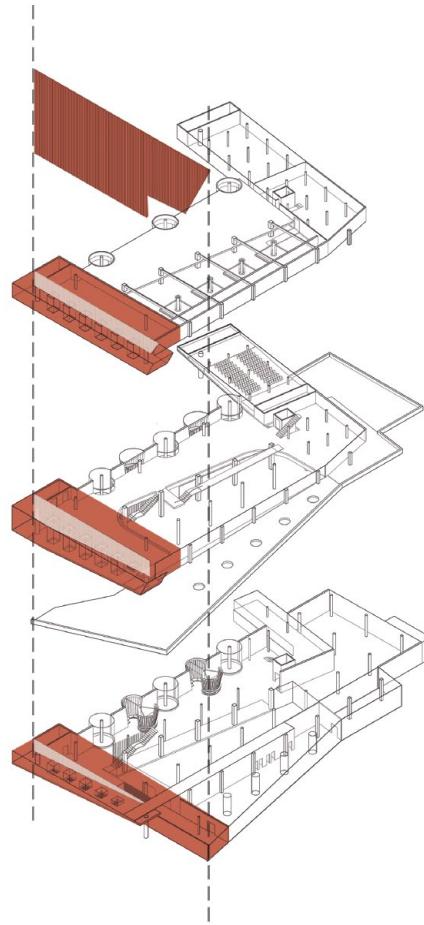


Figure 53. Triage Screen



Figure 54. Main Entry and Suspended Hydroponic Garden

Entering a hospital's emergency department is intimidating and often feared. The Civell Centre's triage incorporates a suspended hydroponic garden that signifies the entry point into the building. This prominent design feature instills a sense of wonder and curiosity in the visitor. It also conveys the functional properties of the structure as a research facility, rather than a place whose sole purpose is to treat illness. Structurally, the garden is supported by a pair of large concrete columns. Its floor plate slopes up over the entry plaza to reveal the main entry doors. Live greenery is encased in glass chambers that extend vertically, and pierce through the roof and floor plates.

A variety of small plant species with shallow roots can be sustained hydroponically in these chambers. For example, flowers, beans, herbs, and strawberries can be grown in the summer or winter months. The hydroponic garden can be accessed internally from the second level of the building. Additionally, the plants grown within the chambers serve to infuse the interior space with calming scents that provide aroma therapy for the occupants.

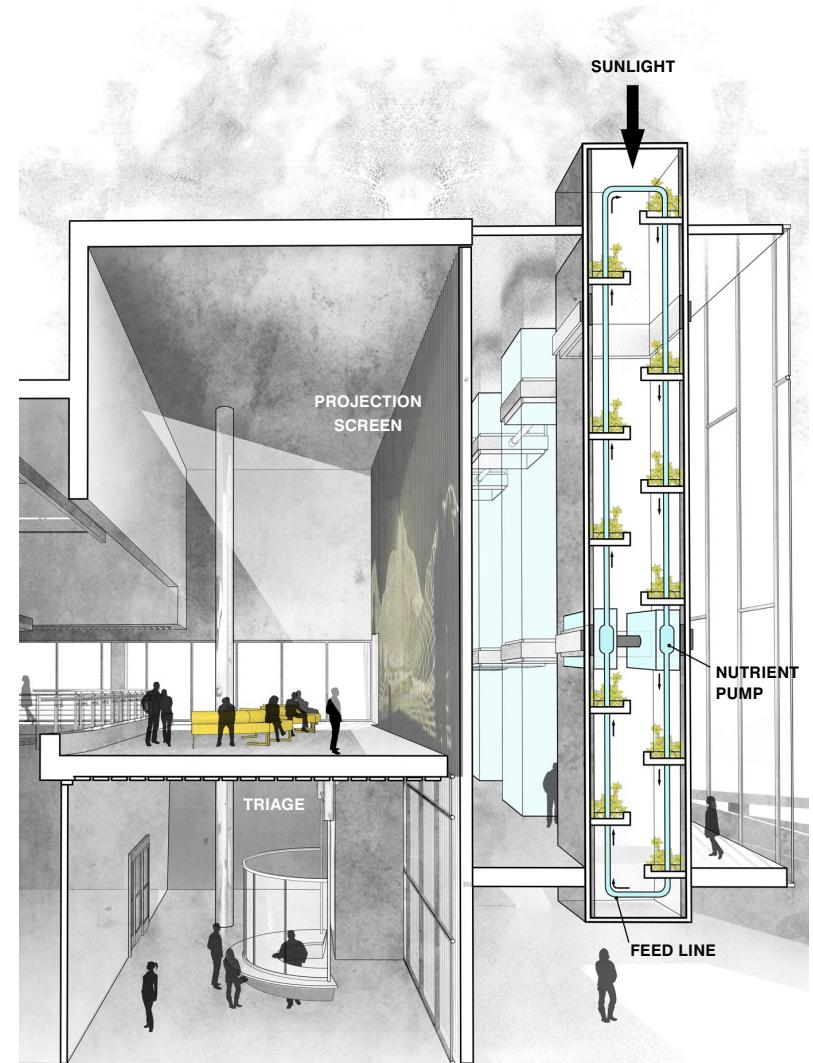


Figure 55. Section Through Hydroponic Garden and Triage



Figure 56. Triage Nurse Stations

*Upon entry, visitors are greeted by triage nurses whose primary responsibility is to assess every patient's medical urgency. A total of three triage stations allow nurses to oversee the activities taking place within. The purpose of this unit is to process patients quickly and safely without producing chaos or confusion. Visitors will spend a minimal amount of time in this space in order to prevent elevated states of stress and anxiety. Digital signage attached to the nurse stations provides clear and concise notifications that direct occupants to their destinations. Glass sliding screens are incorporated in the design of the triage stations to ensure staff safety.*

## ► Infectious Unit

Infection control in the emergency department is a critical step in guaranteeing public health and safety. Approximately one in nine Canadians is at risk of exposure to nosocomial infections, which originate in medical settings. Although not all sources of contagious disease can be completely eliminated, an estimated 30-50% of nosocomial infections are preventable.<sup>10</sup> Surveillance, control of activities, isolation, and ventilation are the most important strategies in preventing the spread of contagions within health care institutions.<sup>11</sup> However, isolating individuals, and controlling where patients come from and what illnesses they carry, is difficult and inhumane. Hospitals should be open and accessible to the public, yet retain a certain degree of control over their occupants.

A crucial step in diminishing nosocomial infections is the control of air flow, as air currents can often transfer airborne diseases from one space to another.<sup>12</sup> The infectious unit of the Civell Centre is physically separated from the other spaces within the structure to reduce the potential spread of contaminated air.

A sloping rooftop garden extends over the entire unit, helping to visually integrate its volume into the overall design of the centre and the surrounding landscape. A separate entrance provided for the infectious department allows known high-risk cases to immediately be diverted away from the lobby space.

Natural and mechanical ventilation are integrated in the design of the structure to control air flow between internal spaces. Negative pressure zones, with non-operable windows, are allocated for highly-infectious cases to reduce air flow and the spread of disease (*Figure 57 & Figure 58*). Contaminated air is exfiltrated out of these zones by means of mechanical fan pressure. Air chambers and a large glass façade provide natural ventilation and fresh air exchange between spaces that are occupied by low-risk patients. The points of entry into the infectious unit are designed to control the passage of hazardous pollutants. Heavy self-closing, lead doors prevent the circulation of air through the rest of the building.

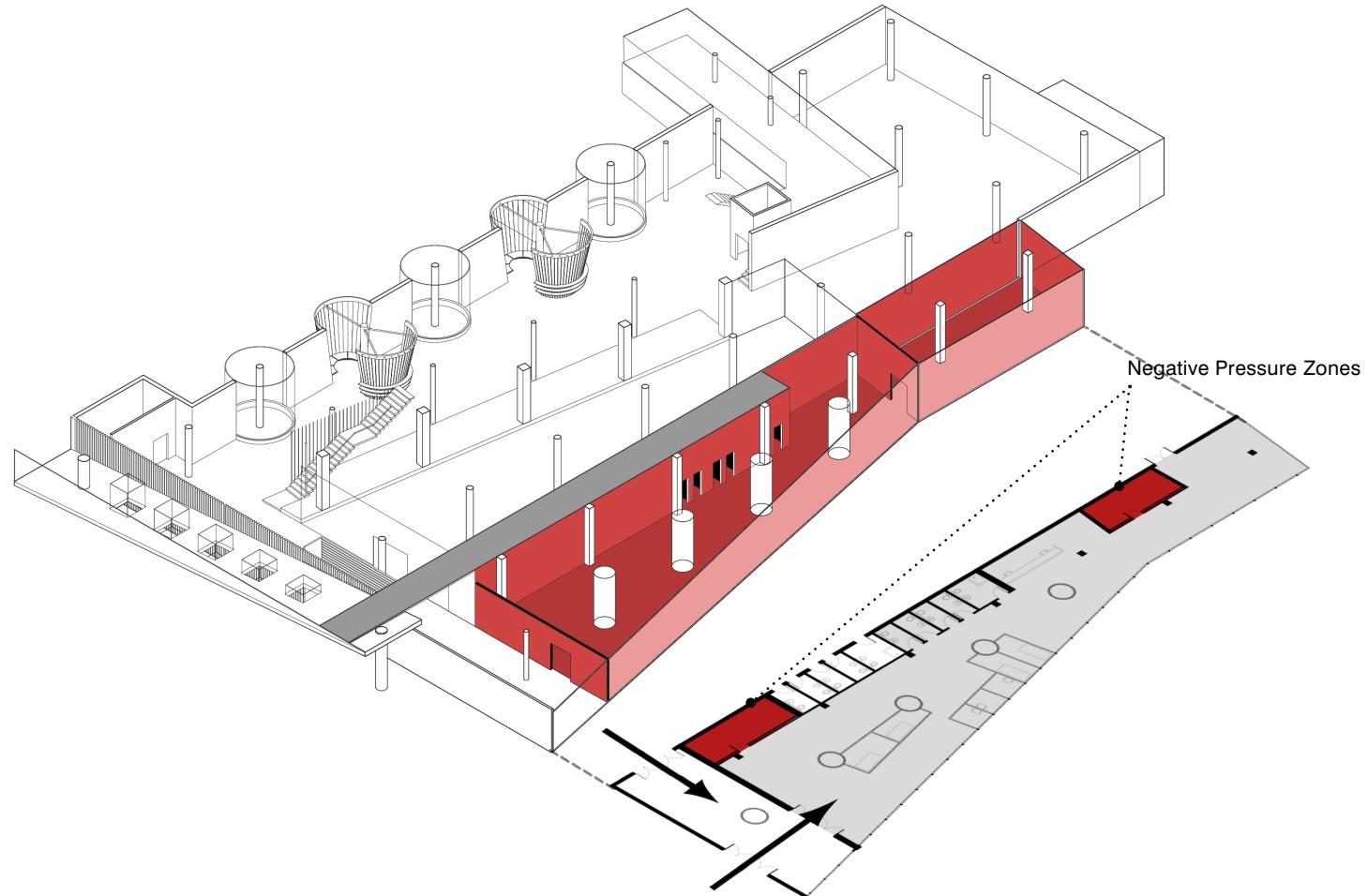


Figure 57. Infectious Unit

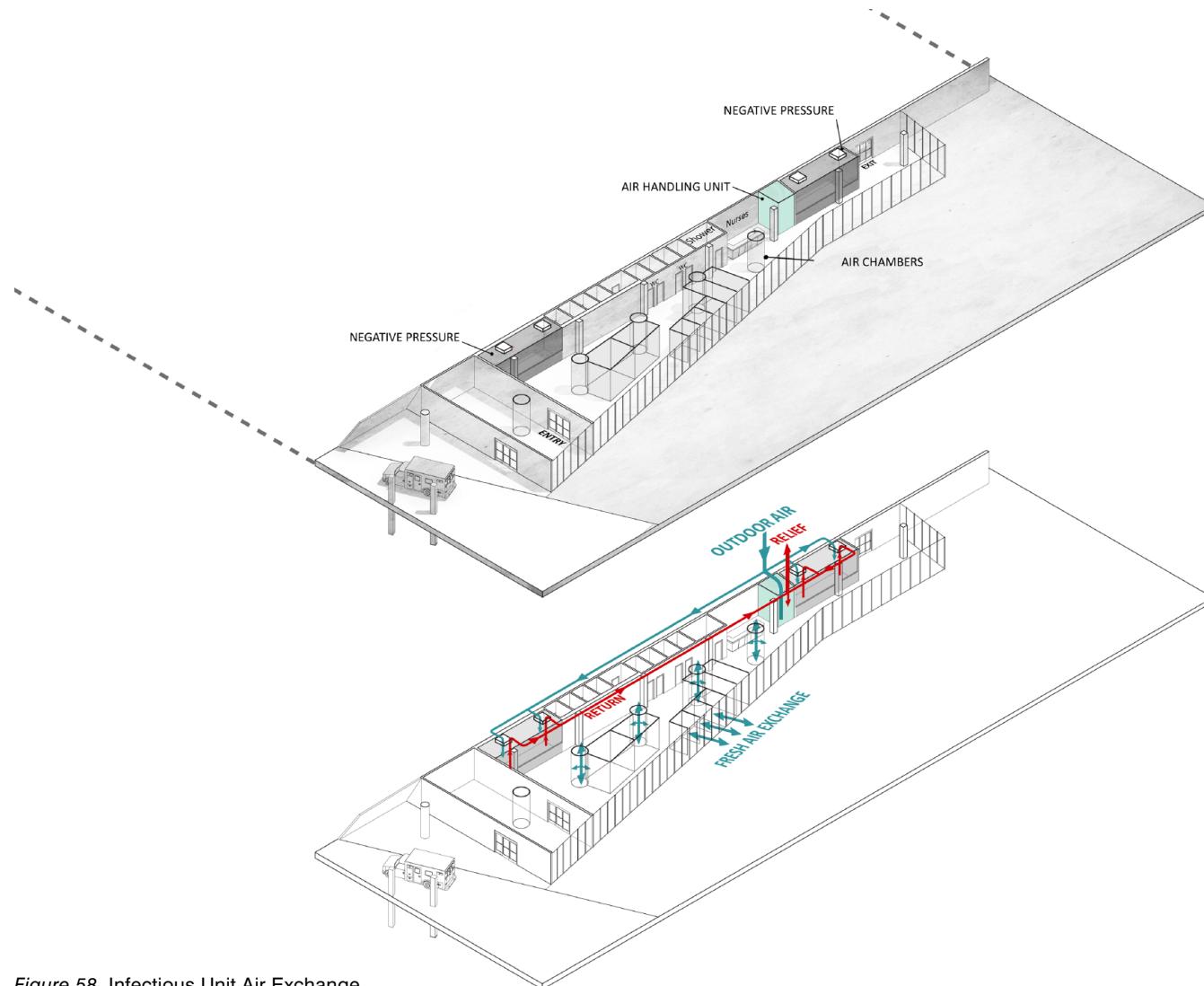


Figure 58. Infectious Unit Air Exchange

The infectious department is restricted to staff members and patients assessed as possible carriers of a contagious malady. Medical staff requires immediate notification of infectious cases in order to direct visitors to the appropriate area, and ensure the safety of all occupants. The strategy to separate this unit from the remaining departments facilitates communication among nurses who are in charge of infection control.

The physical design of a facility plays a significant role in the control of infection. The types of materials used, the number of hand washing stations, and the layout of different zones can control how occupants interact with each other and with their surrounding environment. While other units within the Civell Centre incorporate a variety of different materials in their design, the infectious unit must contain special non-porous surfaces that resist the accumulation of harmful bacteria. For example, certain types of hard wood are extremely porous and difficult to sanitize. Corian, a type of acrylic polymer, is suitable for hospital use as it has a seamless surface, is easy to disinfect with harsh chemical solutions, and comes in a wide range of colours

and translucencies.<sup>13</sup> This material is applied to wall and floor surfaces of the Civell Centre's infectious unit to aid in controlling the spread of nosocomial contaminants.

Private washroom and shower facilities are provided for each patient in the infectious department, as preventative measures to reduce cross-contamination. Resting areas, furniture pieces, and medical equipment are elevated from the floor to facilitate cleaning and decrease the total surface area that may retain infectious particles. Since patients in this unit are unable to freely roam the entire facility, they require certain activities that will alleviate anxiety and reduce boredom. Each de-pressurized personal zone is equipped with adjustable reclining seats, a movie projection screen, music selection, switches that control lighting intensity, and outdoor views to the crop fields. Sliding glass screens limit the spread of infection, and also allow the patient to control the level of translucency of their surroundings.

## ► Urgent Unit

The urgent unit serves to provide patients in critical condition with immediate access to medical care. Located centrally within the building, between the infectious unit and the non-urgent unit, this department has direct connections to the main entrance and the ambulance drop-off zone. The primary focus in the design of this space is the treatment of the ceiling. Patients in urgent care are often wheeled into the emergency department on stretchers. The only point of visual reference they have pertaining to their surrounding environment is the ceiling above. Hospital ceilings are often composed of mineral fiber tiles and harsh lights, which blind the patient and induce stress. Additionally, these standardized ceilings disengage the individual from surrounding activities and the physical environment.

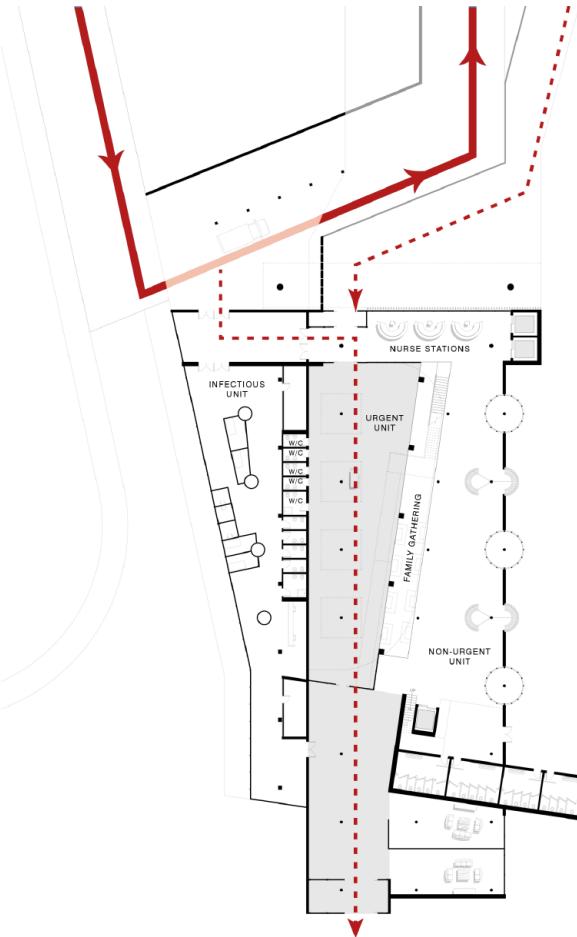


Figure 59. Urgent Unit Arrival at Main Level

The proposed project addresses this issue by integrating a series of raised water-collecting tanks that canvas the urgent unit. A total of four rectangular tanks, supported by structural steel columns, collect rain water and snow. The collected water is filtered down through glass tubes into a shallow tank. The resulting reflecting pool diffuses the water's shadows through a frosted glass plate, projecting them onto the floor below. The water from the tanks subsequently travels down by the force of gravity, to be used as gray water in the adjacent washroom facilities (*Figure 60 & Figure 61*).

The use of a water-collecting system, in combination with a glass roof structure, creates visual ambiguity, instills intrigue, and conveys the purpose of the facility as a research centre. The design also incorporates a linear circulation with an open concept. All amenities and service areas are aligned along one side of the unit, in order to provide an obstacle-free floor space for stretchers and rushing staff members. A designated family zone allows the patient to receive social support from loved ones and friends.

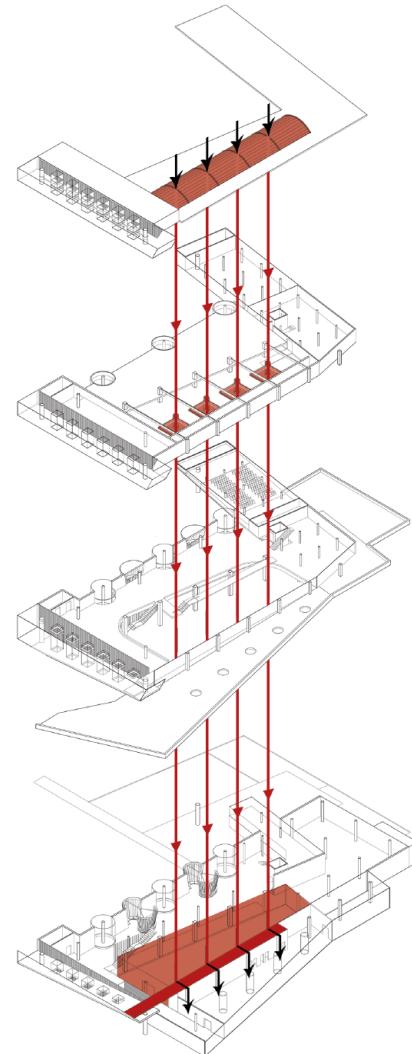


Figure 60. Urgent Unit Water Collection and Distribution

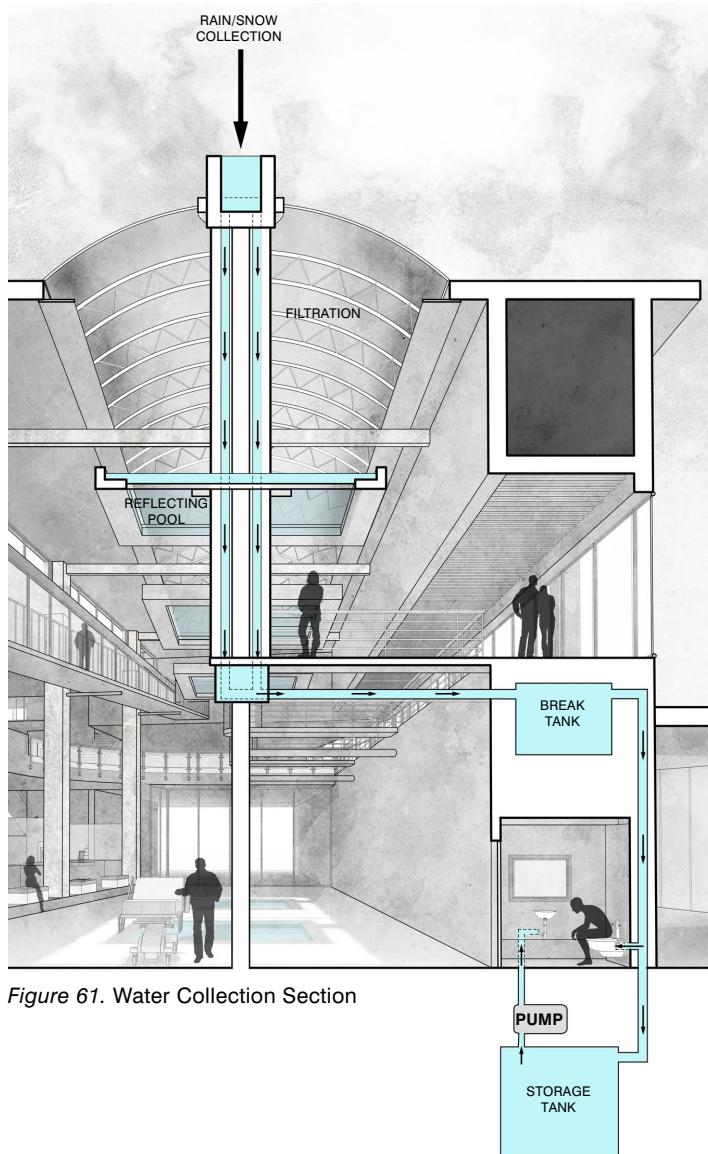


Figure 61. Water Collection Section



Figure 62. Urgent Unit Water Reflecting Pools

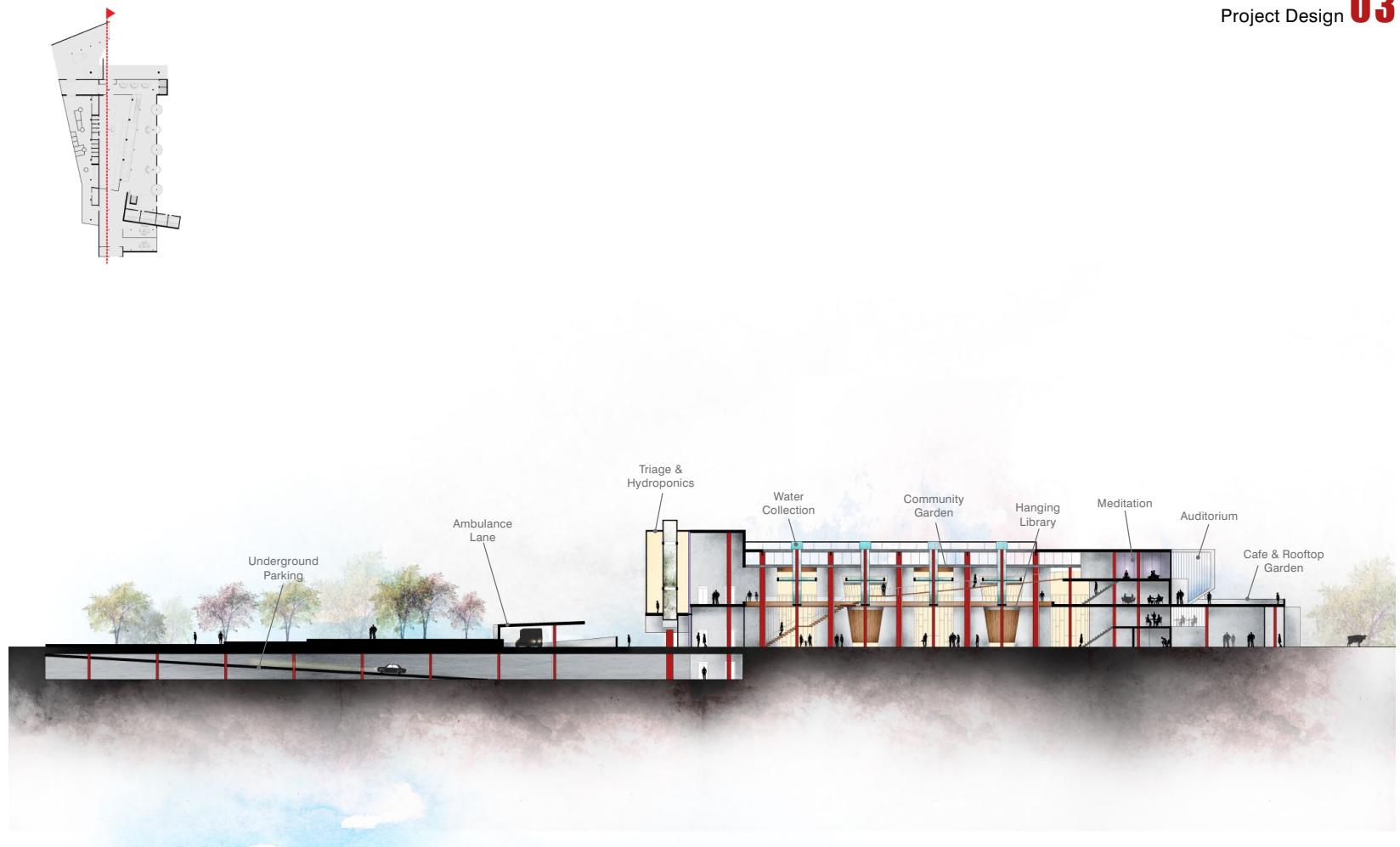


Figure 63. Section through Urgent Unit

### ► Non-Urgent Unit

Spanning over a total of three levels, the non-urgent unit constitutes the largest floor area of the facility. Admitted low-urgency patients often experience wait times of over 24 hours in the emergency department, where they succumb to rumination, anxiety, stress, and boredom. This unit is designed to provide non-urgent patients, as well as their accompanying family members, with a range of activities that divert psychological distress. A suspended wooden staircase acts as the main egress to upper levels. The façade is punctured by a series of oblique and cylindrical volumes, which extend from the first level and penetrate through the upper floors. These elements segment the interior linearity to create pockets of semi-private spaces for small groups of individuals.

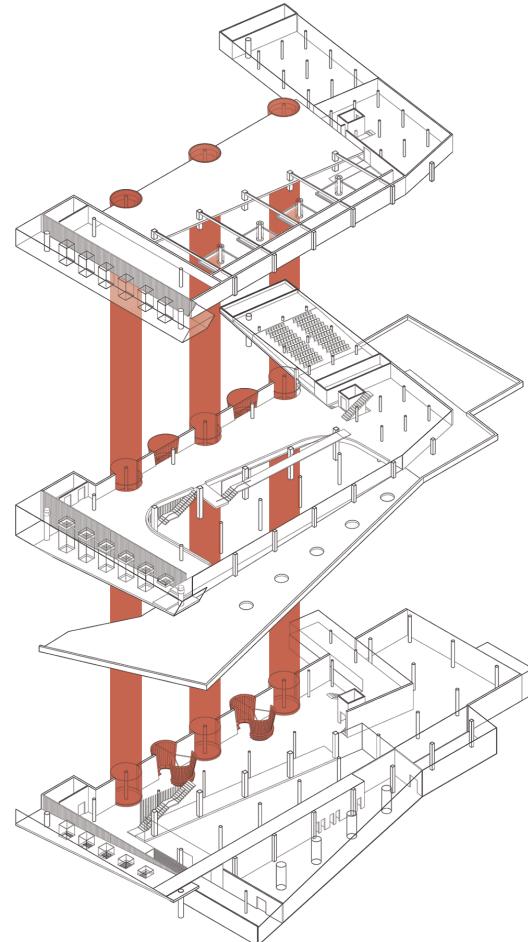


Figure 64. Non-Urgent Unit

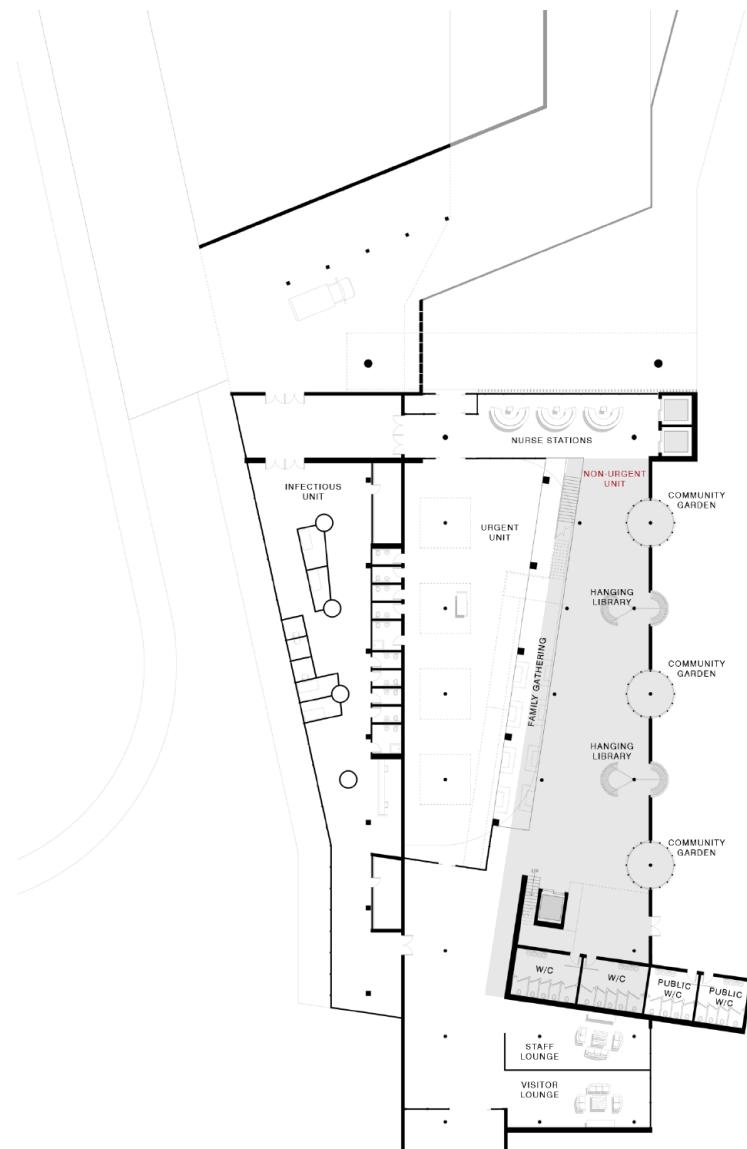


Figure 65. Main Level Plan of Non-Urgent Unit

#### COMMUNITY GARDENS & WISH TREES

*Three cylindrical glass volumes puncture the façade of the non-urgent unit at regular intervals. The interiors of these volumes contain plants and small tree species that are maintained by community volunteer groups. The gardens allow light and the natural landscape to permeate the interior of the building. They are accessible for maintenance from the outside. On the second level, the cylindrical glass casings unfold to reveal the trees planted below. Similar to Yoko Ono's concept of the "Wish Tree" employed in museums worldwide, patients and visitors of the Civell Centre can attach wish tags to the branches of these trees.<sup>14</sup> This ritual provides occupants with a sense of control over forthcoming events (Figure 66).*

- "All my works are in a form of a wish. Carry on thinking about a wish, participating at the same time."

-Yoko Ono



Figure 66. Second Level Wish Trees



Figure 67. Main Level Hanging Library

#### HANGING LIBRARIES

Suspended from the ceiling and supported by steel columns and metal brackets, two hanging libraries provide secluded resting spots for visitors, as well as lookouts into the outdoor public park. The wooden materiality of these sculptural elements is inviting and evokes a sense of warmth and safety (Figure 67 and Figure 68).



Figure 68. Hanging Library Section

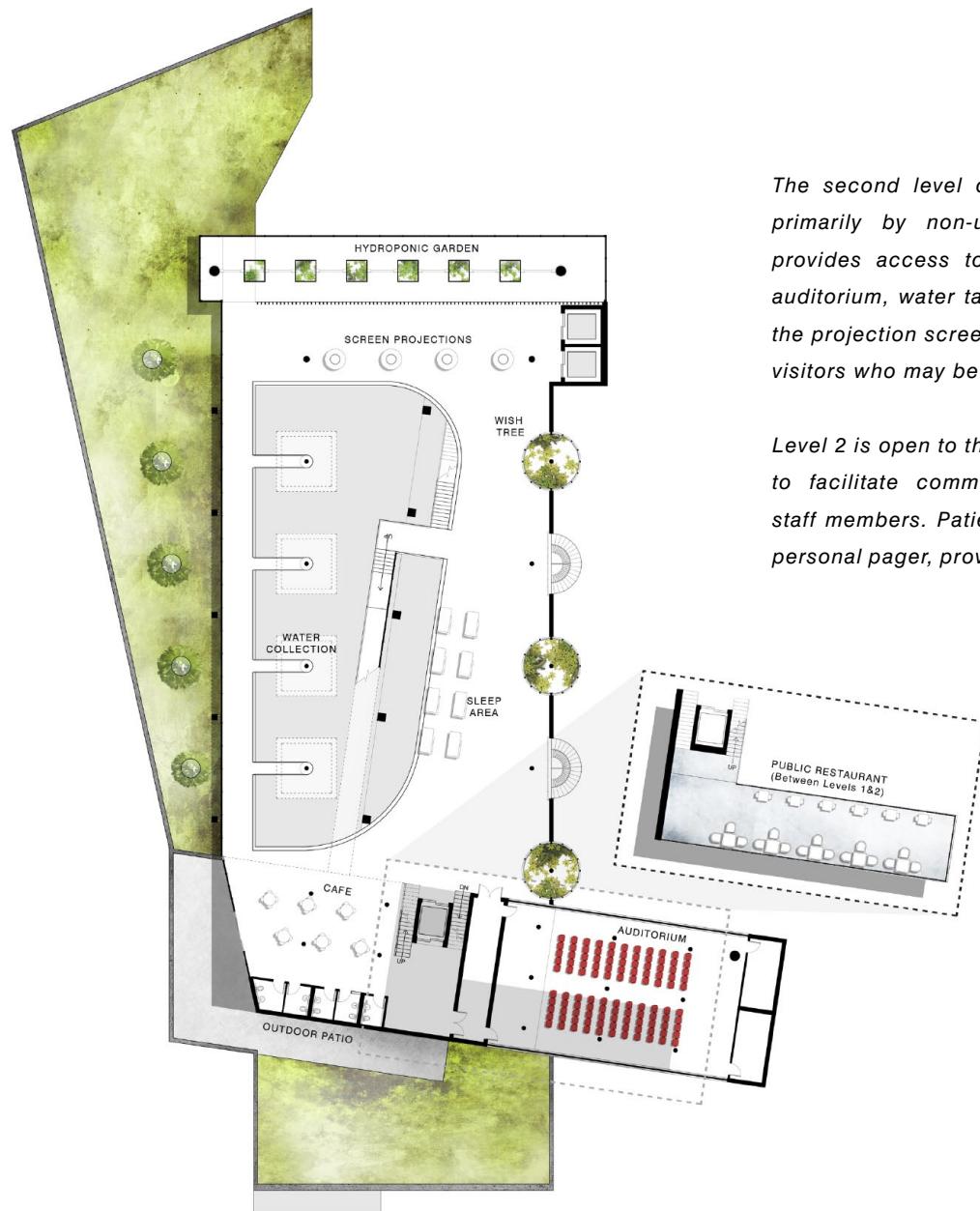


Figure 69. Level 2 Plan

*The second level of the Civell Centre is occupied primarily by non-urgent patients and visitors. It provides access to the hydroponic garden, public auditorium, water tank pods, wish trees, a cafe, and the projection screen. A sleeping area accommodates visitors who may be experiencing prolonged stays.*

*Level 2 is open to the levels above and below in order to facilitate communication between patients and staff members. Patients are called for treatment via a personal pager, provided during the registration stage.*

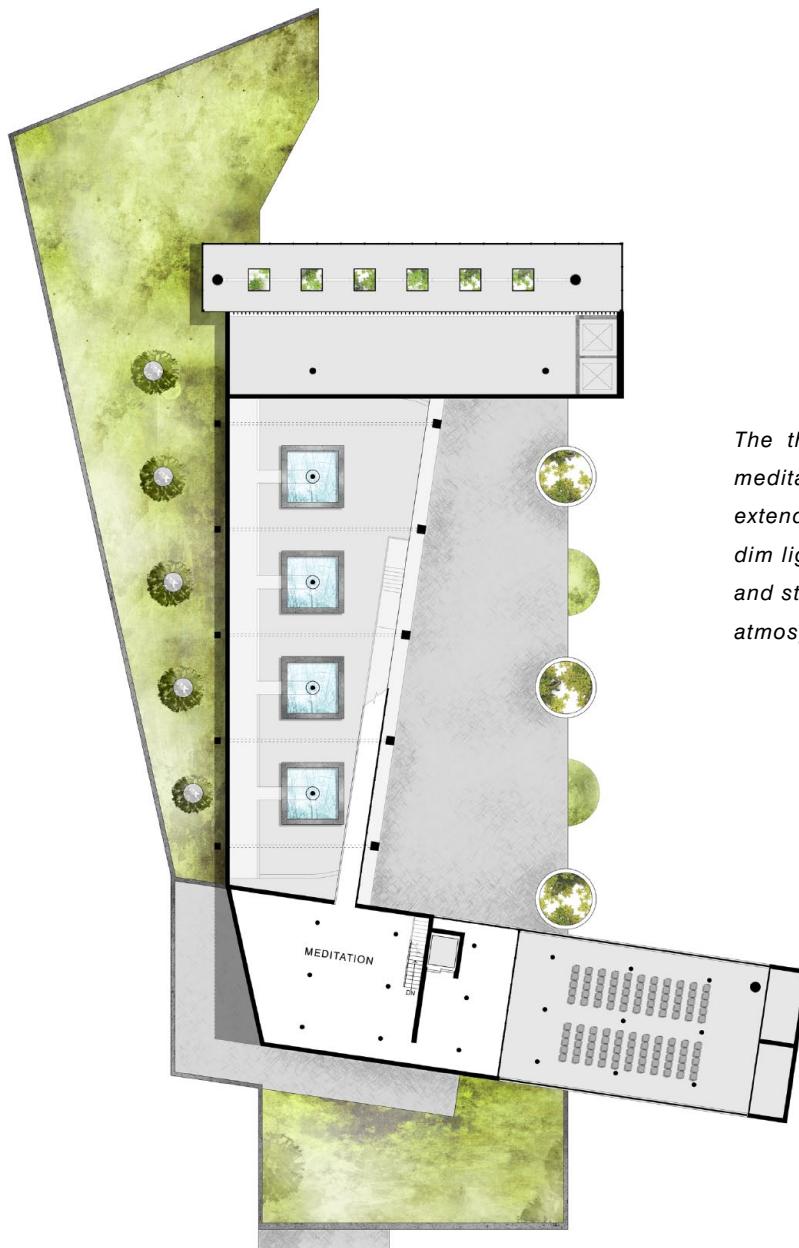


Figure 70. Level 3 Plan

The third, and last level, of the Centre contains a meditation space. It is accessible via a ramp that extends up from the second level. This space has dim lighting and solid walls to allow patients, visitors, and staff members to escape the surrounding medical atmosphere.

## ► Public Space

The final design component of the *Ottawa Civell Centre* contains a semi-public auditorium and restaurant, and a public outdoor park. These spaces are embedded in a separate volume that separates them from the medical environment, and integrates them into the surrounding farmland and urban front. The second-level auditorium cantilevers over the public park below. It functions as a gathering space for staff meetings, patient information sessions, and community gatherings concerning the role of agriculture in Canadian health and economy. Located beneath the auditorium, and slightly elevated from ground level, is a small restaurant intended for public and visitor use. The adjacent public park connects the surrounding urban community to the farm's land. In the summer, the park serves as a public plaza and a children's playground area. A shallow splash pool, resting spots, shaded areas, and public washrooms invite the public to visit the site and learn more about its history and functions. In the winter, the splash pool transforms into a skating rink. The collection of public and semi-public spaces promotes community involvement in the health and well-being of the neighbourhood.

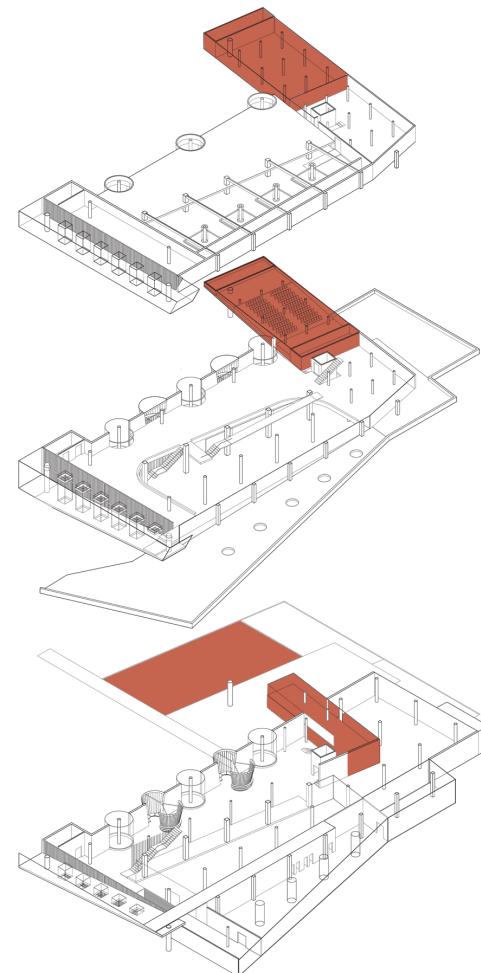


Figure 71. Public Spaces



Figure 72. Outdoor Public Space with Views to Crop Fields and Grazing Animals



*Ottawa is a city with a seasonal climate. During the winter months, the outdoor public park and splash pool transform into a skating rink to attract residents from the surrounding community.*

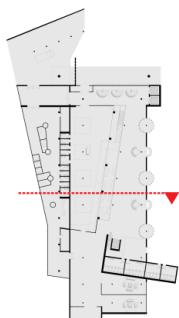


Figure 73. Section Through All Units

### 3.5 Physical Models



Figure 74. Ottawa Civell Centre Wood Model

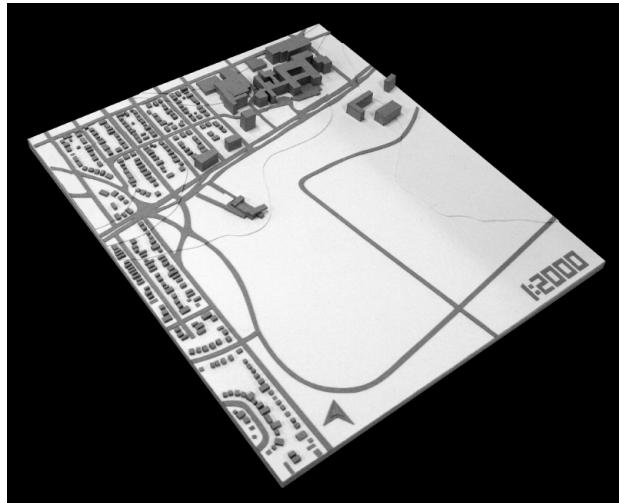


Figure 75 (Top). Site Model

Figure 76 (Bottom). Urgent Unit Lookouts



Figure 77. Arrival Paths



Figure 78. Ambulance Drop-Off Zone & Hydroponic Garden

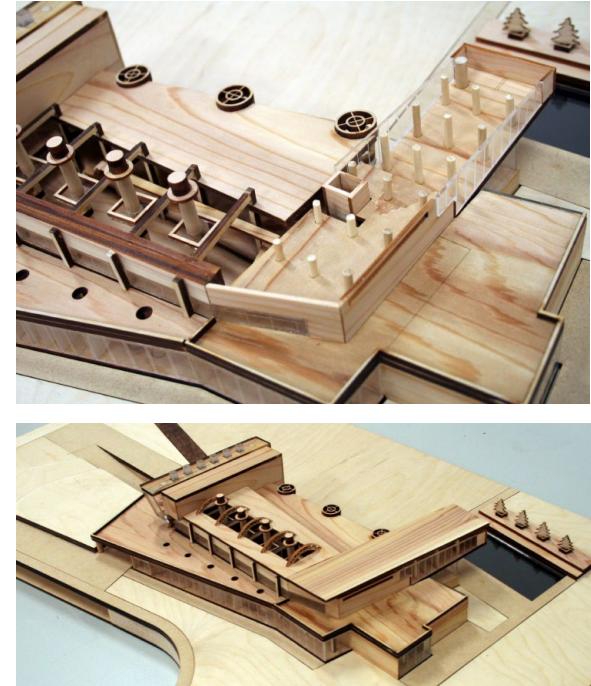


Figure 79 (Top). Auditorium & Structure Detail

Figure 80 (Bottom). Perspective View

## Chapter Notes

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- <sup>1</sup> Yoon, JungKyo, and Marieke Sonneveld. "Anxiety of Patients in the Waiting Room of the Emergency Department." *TEI '10 Conference*, 279-286. Carleton University Library. Web. Oct. 2014.
- <sup>2</sup> Reevely, David. "Civic Hospital to be Rebuilt on Experimental Farm Property." *The Ottawa Citizen*, 3 Nov. 2014. Web. March 2015.
- <sup>3</sup> Author Unknown. "Ottawa Hospital's Civic Gets 60 acres of Experimental Farm Land to Build New Campus." *Metro* 4 Nov. 2014. *Metro News*. Web. Feb. 2015.
- <sup>4</sup> Canada. Government of Canada. Agriculture and Agri-Food Canada. *Central Experimental Farm National Historic Site Management Plan*. [Ottawa]: Agriculture and Agri-Food Canada, 2012. Web. Jan. 2015.
- <sup>5</sup> Ibid.
- <sup>6</sup> Ibid.
- <sup>7</sup> Ottawa Neighbourhood Study. "Civic Hospital – Central Park." Ottawa: ONS. 2015. Web. March 2015.
- <sup>8</sup> Canadian Institute for Health Information. "Health Care in Canada, 2012: A Focus on Wait Times." Ottawa: CIHI, 2012. Web. September 2014.
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- <sup>10</sup> Zoutman, Dick E., et al. "The State of Infection Surveillance and Control in Canadian Acute Care Hospitals." *American Journal of Infection Control* 31.5 (2003): 266-73. Web. 19 March 2015.
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# 04

## CONCLUSIONS



Figure 81. Eliminating the Waiting Room

The health of the individual is a determining factor of the overall well-being of an entire community. Developing strategies for reducing stress and anxiety during times of uncertainty can help build a strong foundation for a healthy society.

## CONCLUSIONS

Wait times are considered a primary concern in Canadian health care planning and economy. Prolonged waits in the emergency department may have detrimental effects on the mental and physical well-being of the patients, visitors, and staff members. Stress, anxiety, boredom, and rumination are among the many symptoms of psychological distress associated with impatient waiting. Although wait times in Canadian hospitals have steadily declined over the past few years, it is unlikely that they can be completely eliminated. A certain buffer period is necessary between the patient's time of arrival at the facility, and the time of discharge. This ensures that large volumes of patients are treated safely and in accordance with staff availability. Thus, it is crucial to transform the act of anxious waiting in the emergency department into a productive activity that alleviates psychological distress.

The design of health care spaces, within which patients and visitors typically endure the passage of time, should ensure occupant safety and health. The proposed *Ottawa Civell Centre*

aggregates all "waiting" zones of the emergency department into a singular infrastructure. The centre not only serves to transfer patients to the future Civic Hospital, but functions as an active research site for Ottawa's *Central Experimental Farm*.

The administration of an initial assessment is a crucial step in the treatment process, as it determines the patient's degree of medical urgency, and subsequent wait times. *The Ottawa Civell Centre* incorporates three specialized units. Each unit is tailored to suit the level of urgency and primary needs of the occupant. This strategy eliminates confusion among occupants and facilitates staff supervision.

The Centre's relationship with the exiting landscape further promotes the health of the surrounding neighbourhood. Public spaces and community gardens attract residents to the site, increase walkability, and promote interest in research and Canadian agriculture. The health of the entire community reflects the health of the individual.

The combining of activity zones into a single structure facilitates the application of the design to alternative projects. Rather than investing funds in redecorating waiting rooms of existing health care facilities, it may be beneficial to reconsider the act of waiting as an opportunity to develop productive habits. Elements considered in the design of the *Civell Centre* may be applied to a variety of health care environments, such as the dentist's office, or the family doctor's waiting room. Providing small gathering spots for families, integrating simple activity zones, exploring alternative methods to treat wall and ceiling surfaces, and promoting community involvement, can aid in alleviating the anguish of anxious waiting.

The ideas presented in this thesis highlight the importance of appointing a secondary function to emergency department waiting zones. The act of waiting can often provide one with time to reflect, meditate, and contemplate. However, waiting in a medical setting rarely allows the waiter to perceive the passage of time in a positive manner. A space that only serves

to provide spots for waiting may heighten psychological distress. Conversely, a space that promotes activities unrelated to the medical field may provide adequate distractions for the anxious waiter. Existing facilities, such as government buildings, museums, train stations, and research centres, may serve to inform the future design of hospital waiting rooms.

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