WAYFINDING: CREATING INTEGRATED STRATEGIES
FOR AN INTERIOR HEALTHCARE SETTING

by

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A Practicum

Submitted to the Faculty of Graduate Studies of
the University of Manitoba
in Partial Fulfillment of the Requirements
for the Degree of

Master of Interior Design

Department of Interior Design
University of Manitoba
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A Thesis/Practicum submitted to the Faculty of Graduate Studies of The University of Manitoba in partial fulfillment of the requirement of the degree

Of

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Abstract

The purpose of this practicum was to analyze existing wayfinding research and practices to inform the creation of a design strategy for interior wayfinding within a hospital setting in Winnipeg, Manitoba, Canada.

The process involved a) conducting a literature review of relevant wayfinding theory and existing precedents, b) completing a programmatic analysis of Winnipeg’s Health Sciences Centre (HSC), and c) merging the theory with contextual factors to arrive at a design solution.

For this practicum, the site included areas in and surrounding the new Critical Services Redevelopment Project (CSRP) at the Health Sciences Centre (HSC) in Winnipeg, Manitoba, Canada. This site and surrounding facilities constitute a complex healthcare environment in which a variety of challenging wayfinding issues are evident. The design programme helps explain information specific to elements of this site as well as particular user requirements. The programme, in conjunction with the theoretical topics outlined, provided the information necessary to develop a set of proposed recommendations that aided the design process, and construct the design framework.

The design exploration encompassed key orienting areas of the building, as well as pertinent paths that lead to the new structure. Underpinned by the theoretical investigations, the final design drawings illustrate the overall spatial organization and design, and provide an innovative solution for the HSC site.

The results consist of a design strategy that identifies ways of organizing, paring down, and integrating interior wayfinding systems. These results are achieved by synthesizing a variety of methods that help people find their way successfully.

This document and the resulting design solution provides an informative example of the challenges that complex interior environments pose for interior designers. The strategies employed in the design solution are potentially applicable to a variety of environments aside from healthcare, such as any public building or set of buildings that is complex in nature and serves a wide variety of users. With regard to healthcare, carefully integrated wayfinding strategies can promote increased hospital staff efficiency, reduce stressful visitor experiences, and promote an overall environment where extraneous and confusing signage is minimized. Additionally, the strategies utilized here provide interior designers with a valid theoretical foundation for developing wayfinding planning that is seamlessly integrated for hospital or healthcare environments, as well as environments outside of healthcare.
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1.0 Introduction

The act of wayfinding is an intriguing human phenomenon. The ability of individuals to receive and assess cues from their environments in meaningful ways is a complex process worthy of investigation. Wayfinding in healthcare environments can function as part of a comprehensive strategy for improved communications with patients, visitors and staff, allowing for the built environment to facilitate a level of reassurance (Parker, 1996). A variety of factors often lead to wayfinding confusion in healthcare environments, resulting in patients getting lost, stressed, disoriented and sometimes aggressive (Jeffrey, 2003). Consequently, a careful analysis of existing wayfinding strategies and applications can potentially result in better designed and healthier interior environments.

The intent of this practicum was to investigate wayfinding systems to support the design strategy objective: to make optimal use of wayfinding cues, thereby assisting individuals in the navigation of interior space. Since healthcare settings are often comprised of complex sets of spaces that require the full attention of the people utilizing such environments, this practicum also analyzes the methods by which people may orient themselves successfully and independently.

The site chosen for this investigation was the new Critical Services Redevelopment Project (CSRP) at the Health Sciences Centre (HSC) of Winnipeg, Manitoba, Canada. This healthcare environment consists of a complex set of buildings which provided an excellent basis for the design exploration.

The rationale for this practicum centers on the need to improve spatial awareness in an environment where spatial relations may be impaired. In other words, given the wide range of users of healthcare environments, not all are able to function with a similar or optimal degree of awareness. For example, visitors to the hospital environment may be preoccupied with personal health issues or the health condition of family members or friends. These individuals can potentially benefit from a wayfinding system designed to reduce stress and anxiety.

This practicum hypothesizes that an integrated wayfinding system is necessary to support successful visitor wayfinding, while simultaneously creating more effective environments for staff.

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1 The term Wayfinding was initially coined in the early 1960's by architect Kevin Lynch when describing street signage, referring to directional elements of the cityscape as way-finding devices. See Lynch (1960).

2 For the purposes of this practicum, an integrated wayfinding system is meant to describe wayfinding elements that are cohesive with the built environment. This involves considering every element in the environment (e.g. materials, lighting, texture, form, etc.) and devising an approach to wayfinding design that allows for the reorganization of the physical landscape. This method can serve to streamline existing signage and create an environment that is memorable for a broad spectrum of users.
1.1 Proposed Benefits of a Wayfinding Exploration (Rationale)

By providing a comprehensive system that potentially allows for successful independent wayfinding, the following outcomes have been achieved:

1. **comprehensive system = independent wayfinding**
   
   Verbal directions required by visitors may be reduced, thereby reducing the need for staff to provide directions. Such changes may also allow for increased staff productivity and focus on patient care (Slater-Enns, 2005).

2. **reduction of disorientation = ease of patient movement**
   
   Reduction of patient/visitor disorientation could amplify patient/visitor movement and punctuality, thereby increasing the effectiveness of hospital scheduling.

3. **increased wayfinding success = improved comfort for all users**
   
   Increased wayfinding success could improve comfort for all users in the hospital environment by contributing to reduced levels of anxiety and frustration.

4. **wayfinding guidelines = benefits for interior design**
   
   Strategies for successful wayfinding could help interior designers better understand how to create environments that meet the specific needs of users.

1.2 Design Questions

When considering the many different types of people and their individual requirements for successful wayfinding, it is important to define questions that are applicable to all healthcare user groups. The following questions led to an investigation of the requirements for successful wayfinding.

1. **How can existing wayfinding strategies be integrated to provide the greatest measure of potential success for users?**

2. **How can information about the various ways that individuals perceive and remember space be utilized to create an environment that is easily understood by users?**
3. Is it possible to promote successful wayfinding through a spatial approach? (i.e. are there volumes, shapes, or forms that influence human behavior within interior environments?)

Addressing these questions within the HSC context increases the need for a comprehensive wayfinding system because hospitals are populated by persons who may have increased levels of emotional and physical distress arising from a broad spectrum of factors.

### 1.3 Potential Biases/Limitations

Some potential biases/limitations that may affect the following study include the following:

1. **Pre-existing beliefs about wayfinding, such as personal attitudes towards which methods are easy or difficult to follow, may have some bearing on the final design.**

2. **Lack of knowledge of existing theoretical approaches may have limited results.**

3. **Unable to test the results of the design solutions, therefore determination of the degree of success of the project is difficult.**

4. **Results are limited to a specific context. In order to apply the theory to other healthcare environments, interior designers would need to consider the particular users as well as contextual elements of a different site.**

### 1.4 Inquiry Process Overview

The following activities were used to compile data for this practicum:

1. **Literature review**: explored the key concepts related to wayfinding as well as topics of significance for interior design, including:
   - factors affecting human spatial orientation
   - key wayfinding principles (classification of areas and general theories)
   - cognitive mapping and memory
   - placemaking and the use of landmarks.
In order to synthesize the findings and to provide direction for the implementation of the findings into the design solution, design guidelines are outlined for each of these sections.

2. **Precedent analyses**: involved the investigation of both successful and unsuccessful applications of existing wayfinding strategies, and the creation of a method for coding important wayfinding requirements. Using the coded requirements, a variety of existing spaces (from an urban scale to the smaller scale of the HSC site) were analyzed in an effort to find patterns necessary to inform the final design solution.

3. **Photographic documentation**: careful documentation and analysis of the existing spaces, signage, and surrounding areas of the project (carried out in the precedent, site & building analysis, and programme sections).

4. **Communication with design consultants and practitioners and signage specialists**: informal meetings with designers of the site, as well as hospital consultants and employees were used to provide information regarding the history of the hospital, existing wayfinding strategies, and future requirements.

5. **Site and building analysis**: provides specific site and contextual information. The site evaluated for this practicum includes areas within and surrounding the new CSRP at the HSC in Winnipeg, Manitoba, Canada. The design exploration encompasses key orientation areas in and around the building, as well as pertinent paths that lead to the new structure. The areas investigated cover approximately 30,000 square feet in total.

6. **Programme for wayfinding**: determines specific user needs and functional requirements for the project, and identifies areas that required attention with regards to wayfinding. This component of the practicum helps define the parameters of the project.

7. **Design section**: the final design segment is detailed and presented through a variety of design drawings. The design proposal builds upon the foundations and analysis developed throughout the practicum to address the challenges faced by designers when attempting to improve or provide effective wayfinding within complex environments. This practicum, therefore, provides one example of how research can inform wayfinding design solutions in an interior hospital setting.

8. **Results**: summary of the project purpose and results, and recommendations for future inquiry and design.
2.0 Literature Review

This section investigates key theories related to the act of interior wayfinding. In addition to definitions and descriptions of important wayfinding issues and concepts, the roles of cognitive mapping, memory, and placemaking theories are discussed.

2.1 Human Factors Affecting Spatial Orientation

Individual differences in wayfinding patterns demonstrate a great diversity that must be accounted for when planning practical application. Characteristics that may predict variance in wayfinding strategies are: age, culture, cognitive impairment, physical impairment, emotional distress, and physical distress. These differences are important to consider because, "...even within a given environment, large differences in configurational understanding are often observed between individuals" (Lawton, Charleston, & Zieles, 1999, p. 205). To provide a basis for the investigation of this disparity, the following topics provide a brief synopsis of differences that can be found in the ability of individuals to find their way.

2.1.1 Age Factors (Aging)

As a significant user segment of healthcare environments, the needs of elderly and aging populations are important. For some, not all of the population, the advance of the aging process results in the decline of sensory performance, most importantly that of vision and hearing (Matthews, Davies, Westerman, & Stammers, 2000). Standard difficulties that arise, and that are applicable to wayfinding, are structural changes to the eye. These changes cause users to require higher levels of illumination as well as provisions for glare reduction to function effectively (Matthews, et.al., 2000).

Although spatial orientation skills vary from person to person, it is important to consider factors that may possibly interfere with successful wayfinding. In Ohta's (1983) research on wayfinding capacity in

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3 For this practicum, spatial orientation refers to an individual's level of awareness and understanding of their physical position within an interior environment.

4 The factors listed exclude sex differences, as the research results of spatial task analysis consulted differed greatly from source to source, as supported by: Matthews, Davies, Westerman, & Stammers. (2000).
the aged, it was discovered, through multiple route trials, that certain elderly participants had more difficulty locating landmarks than their younger counterparts. Although this difficulty is not indicative of all abilities, these findings reinforce the importance of clearly understandable cues when designing a wayfinding system.

According to Matthews et al. (2000): “there are a variety of reasons why ageing is less maladaptive than laboratory data suggests. Older people are often able to develop strategies that can minimize performance deficits” (p. 309). It may be possible to use the advantage of this phenomenon by creating an integrated approach that clearly outlines landmark areas with a consistent theme, supplying the conspicuous cues needed for information to be readily available to all users. Carefully organized wayfinding indicators and landmarks could possibly increase place recognition by providing the tools for wayfinding: regular, highlighted important orientation areas.

**Design guidelines for age factors (aging):**

Based on the findings listed above, it is clear that there are specific issues that need to be addressed for elderly users of healthcare environments. Clarity of approach is essential; an integrated system must be clear in its purpose, with conspicuous cues that highlight key orientation areas. This could be manifested in a specific spatial approach, including cues that differ from the areas around them. Such a consistent expression of form could provide an easily recognizable anchor point, and could possibly be located at prominent intersections and destination points. As well, use of higher levels of illumination and materials or lighting that reduce glare is advisable.

2.1.2 Age Factors (Youth)

For this specific project, a large part of the CSRP includes a new children’s emergency department, as well as additional pediatric hospital facilities. Although children will most often be in the company of an adult, it is important for all users to have the ability to recognize and understand their environment. According to Kevin Lynch (1960), a person’s sense of well-being is deeply attached to his or her sense of space and time.

Since children are continuously engaged in the process of learning, they may experience frequently changing perceptions that influence their wayfinding ability. This fluctuation of awareness that may occur is acknowledged by a number of designers of children’s environments. An example of an environment that accounts for the specific needs of children is the Copper House child care facility of Bolton, Ontario, Canada.
This child friendly day care provides a setting where spaces are shaped differently to inform the primary users (the children) of their function:

Each of the age-specific rooms has four distinct zones — entry, messy, active, quiet - defined by different floor and wall treatments, and ceiling forms. The quiet spaces are small in scale, carpeted, tucked into corners. The wet play areas are tiled, bright, with dramatic curved wood ceilings... (Botello, 1999, p. 51).

By using materials, colour, and volume to design environments that inform children of the space's purposes, the Copper House provides an example of the way in which interiors may be developed to have meaning for children. In turn, this meaning leads to improved place recognition and cognitive mapping ability; the critical elements of successful wayfinding. This case shows consideration for the manner in which children perceive space, carefully defining cues to help inform spatial awareness.

The variation of environmental signals may carry different significance for this younger segment of the population, and should be considered when designing for ease of wayfinding. By creating separate identities for spaces (Wiens, 2000), cues that consist of varying spatial configuration may be necessary for children to understand an area's intended use, as well as the differences between areas.

**Design guidelines for age factors (youth):**

- Careful use of materials, colour, volume, scale, and configuration may be incorporated into a wayfinding strategy that informs children of the identities of individual spaces, as well as their use.

- Space type indicators such as those listed above may need to be very basic and information areas may need to be extremely identifiable from the surrounding environment to be understood by the youthful user.

**2.1.3 Cultural Factors**

Given the diverse cultural makeup of the HSC population, attention to this particular factor affecting wayfinding is important. The various cultures of the HSC can be divided into two types; those defined by **social** culture, and those defined by **physical** culture. Social culture can be characterized by a person's background; whereas physical culture involves their experiences and language (Altman & Chemers, 1984).
Another way of assessing culture is according to divisions of territory: urban, suburban, and rural. An urban territory is one that exists within the city limits, suburban is within reach by automobile, and rural can be defined as all remaining areas, including small towns and undeveloped land (Gartz, 2004, p. 41). Each of these areas has its own specific set of experiences and sense of place, and therefore has a constructed culture of its own.

The multi-cultural nature of the user base at the HSC requires a wayfinding approach that is understandable to the broadest spectrum of people, which makes it difficult to define a specific solution. As the experience of a busy hospital environment may be overwhelming for a number of users because of negative perceptions, or issues regarding familiarity (Altman, & Chemers, 1984), every effort must be made to simplify wayfinding to help address anxiety. It is plausible that certain space typologies and elements of the environment that are highly identifiable, such as a bank of elevators or an information desk, may be significant for one group but not meaningful for others. Consequently, there is a need for a more universal approach to wayfinding: one that is identifiable as its own system, and one that surpasses the standard signage typically utilized as a wayfinding aid.

**Design guidelines for cultural factors:**

A possible approach to addressing cultural wayfinding differences is to provide an element of the wayfinding design that is consistent, and easily decipherable. This could involve the creation of landmarks that are identifiable as orientation areas. These areas could also provide navigation information in a variety of ways, for example, using universal symbols and/or a variety of dialects.

**2.1.4 Cognitive Impairment Factors**

The perception of space by members of society whose brains function in an atypical manner presents a challenge for interior designers. It is necessary, therefore, to identify and codify various differences in perception that occur for people with different cognitive disorders. Although not specifically relevant for the HSC, as it is likely that cognitively impaired users would be accompanied to their destinations, further application of such differentiated analysis could assist in structuring environments that are sympathetic to such diverse sub-groups.
An example of one of these sub-groups is people with dementia. Researchers Passini and Rainville (1998) conducted an investigation into the wayfinding ability of people with dementia. After being asked to reach a specific destination, results from the study showed that most dementia patients were incapable of developing an overall plan to solve wayfinding tasks presented, and were unable to produce decisions involving memory or inferences. Conversely, the study subjects were better able to make decisions based on information of explicit architectural nature (spatial landmarks). Also, these patients experienced difficulty when forced to extract relevant information from graphic displays, and were often confused by irrelevant information displays (Passini & Rainville, 1998, p. 133). It should be noted, however, that the level of spatial impairment of dementia patients will differ depending on the stage of their condition. To address these and other challenges, a careful consideration of a combination of traditional wayfinding systems with a strong spatial differentiation approach could be advantageous for those users with varied cognitive abilities.

**Design guidelines for cognitive impairment factors:**

- To successfully address the needs of people with cognitive impairments, it may be necessary for wayfinding strategies to include traditional elements, such as architectural elements that manifest a great deal of meaning for the users, and refined and clearly marked signage with a strong emphasis on creation of place. This could be manifested by clearly marking all important decision point areas, as well as carefully articulating, architecturally, the main areas of the healthcare environment in a way that creates meaningful space differentiation.

### 2.1.5 Physical Impairment Factors

Members of society with various physical conditions that affect vision, hearing, and mobility have different requirements for wayfinding. Consequently, there are various ways that existing wayfinding strategies can be challenged to create practical methods of navigation for these users.

It has been found that visually impaired individuals use far more landmarks for wayfinding at decision points than they do at other points. As well, visually impaired people are more likely to need supplementary information in the environment than sighted users (Brambring, 1982). However, since some
research (Passini & Proulx, 1988) indicates that visually impaired users demonstrate similar spatial cognition and representational skills to those demonstrated by sighted subjects, there may be ways of designing for wayfinding efficiency for both groups in a complimentary manner.

According to Universal Design Consultant Gail Finkel (Personal communication, October 2002) people with diminished visual ability, who are dependent on audio perception for interior wayfinding, may find spatial variation to be somewhat confusing in large areas, as volume can somewhat distort environmental sound cues. This is important to consider because a wayfinding solution that creates a variety of volumes for space differentiation may not be suitable for all users.

Users with hearing impairment could benefit from a highly visual approach. Therefore, areas with distinct visual appearances would be beneficial. For individuals who experience varying degrees of mobility impairment, a variety of volumes and shapes could be effective for navigation as long as all horizontal planes on the path of travel are universally accessible.

The most crucial factors to consider when designing for users who have varying degrees of physical ability are to: a) provide the opportunity for augmentative and alternative communication devices, b) remove environmental barriers that may prevent people from moving freely, and c) provide users with the ability to have a choice about how they inform their path of travel (Stewart, Allan & Ripat, 2002).

**Design guidelines for physical impairment factors:**

**Visual:**

- Landmarks, as well as highly contrasted elements, are helpful for orientation at decision points.
- Information must be provided in a variety of ways and in a consistent manner. (e.g. through sound: spatial size is indicated, touch: texturing marking pathways, entrances, information desks, etc.).
- Wayfinding cues consisting of form or space, may need to be restricted to smaller areas because large, open spaces may interfere with audio perception.
- The introduction of cues in the form of directional flooring, audio signals, path railings, and Braille signage systems have been used previously with great success. When considering the design strategy of wayfinding cue integration, careful allowance for the ease of use of these established elements must be incorporated.
**Hearing:** Creation of visually distinct areas helpful to create dynamic landmarks to aid navigation.

**Mobility:** Spatial variation approach could be helpful, as long as path of travel is accessible.

**Principles of Universal Design:**

1. Equitable use
2. Flexibility in use
3. Simple & intuitive use
4. Perceptible information
5. Tolerance for error
6. Low physical effort
7. Size & Space for Approach & Use (Everton, 2003)

---

### 2.1.6 Factors of Emotional and Physical Distress

Emotional and physical distress factors are especially relevant. For the HSC context, people suffering from emotional and physical distress could possibly benefit from a number of wayfinding strategies. For example, using multiple methods together, or *redundancy of cueing*, may be a feasible solution even though over-cueing introduces the possibility of inadvertently confusing users.

When considering the circumstances of a hospital, the importance of accessible, interpretive wayfinding is very clear. As Malkin (1984) explains, "In this context, getting lost might mean missing an appointment for diagnostic tests or not finding your child in the emergency room. Anxiety and stress can impair one's ability to process information, and often signs are not read" (p. 111). Given that people with emotional or physical distress experience difficulties in assimilating their environment, the refinement of wayfinding cues could beneficially impact the wayfinding process. Any physical elements that would reinforce a sense of direction or place could help to alleviate anxiety.

Although anxiety is occasionally associated with improvements in performance, for the most part, stress and anxiety have a detrimental effect upon human cognition (Matthews, et. al., 2000). It is quite possible that through careful design, human anxiety can be managed through the environment. This notion is asserted
by researcher Pekrun (1992) who stresses the importance of anxiety prevention by optimizing an individual’s chances of coping in any environment. Possible strategies for environments to reduce instances of anxiety are those that provide user feedback. The reinforcement of location through the use of site maps, and clearly announcing arrival at destinations can help to reassure users that they are on the right track. A system that is easy to recognize and provides repeated encouragement could, in all likelihood, assist user orientation ability by decreasing levels of anxiety associated with wayfinding.

**Design guidelines for emotional and physical distress factors:**

- For individuals that may have difficulty identifying or understanding wayfinding cues because of increased levels of stress, redundancy of cueing could provide a beneficial approach.

- Providing a variety of wayfinding cues to enhance perception of orientation could be achieved by carefully combining and orchestrating the elements of the environment. The strengthening of sense of direction, place, and arrival is important, although careful attention is required to prevent extraneous information from distracting the user.

- A possible approach could involve patterning volume and form with existing wayfinding devices to provide users with a streamlined strategy for obtaining wayfinding information. If designed with consistency, this tactic may serve as an additional navigational resource for those in need.

**2.1.7 Design Guidelines**

From the examples shown in the human factors affecting spatial orientation section, it is evident that there are a wide variety of user needs to consider when designing an integrated system. This practicum proposes to show that, if carefully considered, a systematic wayfinding methodology can be incorporated into building design and renovation, adding value to any public space. Further, as "experience with an environment is thought to result in two types of knowledge: knowledge of route connections between locations and knowledge of overall spatial configuration" (Lawton, et. al., 1999, p. 204), a carefully organized wayfinding system could serve to lead occupants in an unobtrusive way to their destination[s]. Table 1, (p. 25), provides a concise overview of the items discussed in this section. By employing these design guidelines, it may prove possible to increase user understanding of the environment.
<table>
<thead>
<tr>
<th>Human Factors</th>
<th>HSC User (Relevance)</th>
<th>Design Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (Elderly)</td>
<td>High (aging population)</td>
<td>• Clear approach required, highlighting of key orientation areas&lt;br&gt;• Use consistent expression of form&lt;br&gt;• High level of illumination&lt;br&gt;• Non-glare materials/lighting</td>
</tr>
<tr>
<td>Age (Youth)</td>
<td>Low (accompanied by adult)</td>
<td>• Strategic use of materials, colour, volume, scale, and space configuration depending on area&lt;br&gt;• Information areas must be basic, identifiable</td>
</tr>
<tr>
<td>Culture</td>
<td>High (hospital population)</td>
<td>• Use easily decipherable elements&lt;br&gt;• Employ consistent landmarks that are identifiable as their own system&lt;br&gt;• Use universal symbols, variety of dialects</td>
</tr>
<tr>
<td>Cognitive Impairment</td>
<td>Low (accompanied by adult)</td>
<td>• Use traditional architectural elements that may have relevant meaning for users&lt;br&gt;• Refine and clearly mark signage&lt;br&gt;• Create a sense of “place”&lt;br&gt;• Provide spatial differentiation</td>
</tr>
<tr>
<td>Physical Impairment</td>
<td>Medium (variety of users)</td>
<td><strong>Visual:</strong>&lt;br&gt;• Landmarks are key at decision points&lt;br&gt;• Information must be available in a variety of ways: sound (size is indicated), touch (texturing can mark pathways, entrances, information desks)&lt;br&gt;• Spatial wayfinding cues should be avoided in large, open areas&lt;br&gt;• Existing strategies for the visually impaired must be incorporated&lt;br&gt;• Highly contrasted elements for low-vision users&lt;br&gt;&lt;br&gt;<strong>Hearing:</strong>&lt;br&gt;• Visually distinct areas for space recognition&lt;br&gt;&lt;br&gt;<strong>Mobility:</strong>&lt;br&gt;• Spatial variation can be employed, as long as it does not impede user movement</td>
</tr>
<tr>
<td>Emotional and Physical Distress</td>
<td>High (acute care areas)</td>
<td>• Employ a streamlined redundancy of cueing strategy&lt;br&gt;• Reinforce sense of direction, place, and arrival, possibly with pattern and form (user feedback)</td>
</tr>
</tbody>
</table>
In Table 1 (p. 13) it is apparent in that there are common needs for spatial identification across the range of user groups. It is imperative that the design solution be clear (refined), provide consistent orientation areas that are highlighted in a variety of ways (through shape, form, or landmarks), and provide a variety of means of obtaining information to help the largest segment of users.

2.1.8 Existing Factors Affecting Wayfinding (Re)Design

Existing healthcare interiors may be difficult to adapt because they often consist of large building complexes that have grown in stages over time, and that are currently linked together. This is the case for the CSRP development at the HSC. After a period of growth that spans more than a century (Health Sciences Centre, 1993), a variety of buildings have been linked together and now provide a great challenge for designers. A variety of factors must therefore be considered when designing for wayfinding success.

Another factor that must be considered for wayfinding design is the presence of existing wayfinding strategies. Special attention must be paid to the systems that have served the building in the past. Where possible, these existing strategies must be incorporated with great care to ensure a clear and understandable approach (see section 4.9, p. 75 for information regarding existing signage strategies). Again, this is the challenge evident at the HSC.

Summary: The process of wayfinding is a complicated one. It involves an individual's ability to organize multiple layers of messages that exist at any given time within any environment. Therefore, clarity of approach is essential, as “...successful wayfinding involves knowing where your destination is, following the most direct path to it, recognizing your destination when arriving, and the ability to recreate the path when leaving” (Aichinger, 2001). Further elements of successful wayfinding include getting to and from your destination from the outside environment (e.g. city) and remembering the correct path on multiple visits. It is therefore crucial for designers of the built environment to create solutions that provide for an excellent measure of navigability. Given that wayfinding strategies exist in many different forms in many different environments, an analysis is warranted of the methods that might provide the greatest measure of effectiveness for the primary user groups in relation to a specific context.
2.2 Key Wayfinding Elements

Theoretically, wayfinding systems can be segmented into separate elements that inform the manner in which individuals navigate their way through space. A number of researchers have categorized the deconstruction of wayfinding activity into its tangible reference points. In particular, the work of Kevin Lynch (1960) provides a number of excellent examples of factors that are easily applicable to a healthcare environment. Lynch eloquently explains his approach by stating that: “nothing is experienced by itself, but always in relation to its surroundings, the sequences of events leading up to it, the memory of past experiences" (p.1)

While Lynch's (1960) approach guides this design exploration, it should be noted that other theorists ascribe different precedence to other wayfinding elements. For example, while generally agreeing with Lynch, Gerald Weisman (1980) "has looked at the factors that influence wayfinding in buildings and found that plan configuration was the most influential (wayfinding factor), followed by spatial landmarks, spatial differentiation, and finally signage and room numbers" (Baskaya, Wilson, & Ozcan, 2004, p.840) (Weisman, 1981). This demonstrates that there is some disagreement regarding the hierarchy assigned to the different wayfinding elements, but not necessarily to the elements themselves. Lynch considered spatial landmarks, in general, to sit atop the hierarchy. However, as will be demonstrated in subsequent sections, Lynch does not limit his analysis to a single element.

Although written as an analysis for the urban environment, Lynch's (1960) principles translate well to the scale of interiors, because they provide a strong link between wayfinding and the human phenomena of cognitive mapping. These universal components, as classified by Lynch, are as follows:

a) Paths  
b) Edges  
c) Districts  
d) Nodes  
e) Landmarks

Reginal Golledge (1987) describes pathways as spatial components consisting of distance, direction, and orientation; Arthur and Passini (1990) outline five interdependent elements of destinations, destination zones, routes, decision points and reference points; Christian Norberg - Schultz (1965) explains interior space as consisting of places, paths, and domains; while Bloomer and Moore quantify the built environment in terms of place, path, pattern, and edge.
Summarizing Lynch, the following quotation by Malnar and Vodvarka (1991) explains these elements in relation to interior environments:

...paths are the channels (like streets and corridors) of our environment; edges represent the more or less permeable boundaries (separating areas); districts are areas with fairly definable characteristics (like waiting areas); nodes are strategic focal points (like central stairways); and landmarks are easily identified and dominating physical elements. (p. 47-48)

The concept of "breaking down" the environment into smaller segments is important for interior designers. It stresses the significance of dividing up the wayfinding cues within larger environments into smaller areas that may be more effectively understood by navigating users. This view is echoed by Siegel and White who consider, "levels of cognitive mapping [to] begin with landmark elements. They propose that landmark knowledge precedes route knowledge, and both precede configurational knowledge in [an] environment..." (1975) (Baskaya, Wilson, & Ozcan, 2004, p.842). The next sections provide further analysis of Lynch's wayfinding elements, and evidence of specific examples from the site to illustrate these components in context.

### 2.2.1 Paths

In relation to the city construct, Lynch (1960) describes pathways as the channels through which individuals move. He asserts that these transportation corridors are predominant aspects of our environment that serve as organizing elements which aid our mental arrangement of places in a particular sequence. This notion of the path is an interesting one. It stresses the importance of pathways not only for transportation, but as instruments by which we organize our environment in a meaningful way. Figure 1 depicts a major pathway in the HSC, with a prominent element (The General Store) shown as a point of reference along the path.

![Figure 1: Major HSC Pathway](image-url)
Additionally, Lynch (1960) makes mention of the phenomenon of pathway identity, those conduits that have a particular concentration of use or activity become, themselves, a prominent image in the mind of inhabitants. As well, urban pathways that contain cohesive architectural components, such as unifying façades, reinforce the identity of a pathway, making it a specific point of reference for all who use it. This description of path provides key ideas that may be applied to the interior environment. Figure 2, (p. 30) shows an example of an approach, within the HSC, that creates identity through floor treatment for a particular path.

![Figure 2: HSC Corridor](image)

By using the model of an urban transportation corridor, the translation of elements that contribute to spatial orientation in the exterior environment could be synthesized to inform clear wayfinding in the interior realm. As evidenced here, the application of materials suggests a particular use for this type of space, with the design elements providing a definite sense of movement and path.

**Design guidelines for pathways:**

- By assessing the ways that the internal pathways of a healthcare environment affect user orientation, it may be possible to design a system that incorporates the key ideas described by Lynch (1960). For example, the interior transportation areas of a hospital could be augmented to provide a meaningful link to important areas. This could be accomplished by increasing visual access to all appropriate areas from the main path of travel, supporting the notion that the pathway, itself, serves to orient significant areas for the user.
As well, pathway identity may be formed if the route itself has a particular association. In addition, pathways could be designed to exhibit unifying characteristics to create a cohesive appearance, or feel, thereby reinforcing path identity. This could be achieved in a variety of ways, from the visual, to the textural, to the patterning of spatial form.

2.2.2 Edges

Edges are identified by Lynch (1960) as mainly linear elements that are not used as pathways by observers. Edges consist of boundaries between spaces that may or may not be penetrable, defining one area from another. Figure 3 provides an example of edge separation.

Although this rest/eating area is not divided from the adjacent spaces, it is clearly marked as a separate entity through the use of a bulkhead formation and lighting above. Serving to define individual areas, edge elements exist as indicators that clearly differentiate one space from the next. (Lynch, 1960) For interior designers, understanding the importance that edges have for users is valuable. These elements can serve a dual purpose in the built environment: a) to create separation of space and b) to provide additional cues for interior navigation.

Design guidelines for edges:

- Since edges provide definition from one area to the next, they can be easily incorporated into a wayfinding strategy. Although used in a slightly different manner than pathways, they can also be designed to highlight important areas and to cue hospital users as to the function of a particular space.
• Placing emphasis on the linear defining elements of these markers may be particularly helpful. It may be necessary, however, to consider all edges in an environment that is to be redefined with wayfinding in mind, to capitalize on the orientation indications that they provide.

2.2.3 Districts

In the urban environment, districts are considered to be large areas that the observers mentally “enter” even though there may be no recognizable outline of the space that users are entering. These regions are defined by a particular unifying characteristic that is identifiable from within its confines, and is also sometimes identifiable externally. Lynch (1960) explains that the majority of people segment their environment into districts, using the large entities that they create as a means to break down the larger environment. Shown in Figures 4 and 5, (p. 34), are examples of the complex tunnel system that connects the various buildings within the HSC to one another. Clearly a corridor situation, these tunnels are fairly nondescript in nature, but are easily identifiable as a particular area of the hospital (the underground level). The characteristic multi-coloured mechanical conduits and pipes are excellent markers for this district.

In relation to healthcare settings, individual medical wards or buildings exist as wayfinding districts or regions. If the assumption is made that a particular space is identifiable due to the elements that are inherent to its function, such as stretchers in the Emergency area, advanced equipment in Radiology, or numerous visitors in lounge areas, it may serve to capitalize on this awareness to create a greater sense of place for users.
Design guidelines for districts:

- The definition of distinct districts is an important component to consider when designing wayfinding systems. It may be possible to capitalize upon elements that are easily identified as belonging to a particular area of a healthcare environment (example: wards). The reinforcement of interior sets of districts could provide a way for a complex hospital environment to be sub-divided into groups of spaces that, themselves, have a strong identity or sense of place.

2.2.4 Nodes

Nodes, according to Lynch (1960), exist as points within a city into which an individual can enter, and are primarily places of importance within a particular district. Nodes may consist of transportation junctions, a crossing of paths, or a shift from one structure to another. These areas of concentration gain importance from their physical character or use. Figure 6, (p. 34) demonstrates a key node within the HSC. This image shows the current general hospital entrance, which branches off into a variety of paths. The concentrated use of this specific node makes it a prominent place within the hospital.

![Figure 6: HSC Entrance Node](image)

Often the focus or core of a particular district, nodes can serve as symbols for entire areas, becoming a dominant or defining feature (Lynch, 1960). This is a key concept for designers, when attempting to create areas that are easily identifiable to contribute to wayfinding success. Understanding that a particular node within an area creates a landmark that is characteristic of the whole area is crucial to understanding how individuals identify a particular place.
Additionally, nodes that consist of junctions of paths provide a point of decision, and therefore an opportunity for designers. Lynch (1960) notes that junctions create a pause in the path of travel, as they are often decision point areas. The break of activity and decision related aspects of these areas cause users to increase their level of awareness, allowing elements in the vicinity to be perceived with greater attention. Therefore, nodes serve a dual purpose: a) they create a specific identity point for a greater area, and b) they provide an arena of heightened awareness. These characteristics show that nodes must be carefully considered in order to ensure that their inherent meaning and sense of place is easily identifiable for the user.

**Design guidelines for nodes:**

- Nodes are positions within an interior that can be used to benefit wayfinding success. If carefully designed, they can provide a marker for an entire segment of a building, an entire building, or a set of buildings.
  - These areas also create a place where other wayfinding elements may be successful. Noting this, a strategic wayfinding design could place important wayfinding cues in these areas. Possible approaches could involve providing areas for landmarks within the node, areas for rest or orientation, and places where the user has the time to assess environmental information.
- Nodes could also incorporate the space type, materials, colour, texture, pattern, and lighting of the surrounding areas in order to indicate the type of environment within which the user is situated.

### 2.2.5 Landmarks

Lynch (1960) describes landmarks as another form of orientation reference, and claims that they vary from other forms of wayfinding elements due to their individual nature. Landmarks can consist of any physical object that significantly differs from its surroundings. Some can serve as a constant point of reference, whereas others can be more localized, smaller in scale, and highly identifiable. In an interior environment, landmarks can be extremely useful for user orientation because, as points of reference, they may serve as important indicators of place. Figure 7, (p. 36) depicts a common type of interior landmark: a bank of elevators.
Landmarks are also integrally linked with pathways. Lynch (1960) remarked that landmarks are increasingly used as a journey becomes more familiar, developing into a main indicator of route. Additionally, the location of a landmark at a junction point involving path decisions strengthens the recognition of a landmark, and may reinforce a particular sequence of travel. Landmarks are key components for a successful wayfinding system. They are elements that can serve to highlight important orientation areas of an environment, and provide meaning for visitors by supporting opportunity for variation within an interior.

**Design guidelines for landmarks:**

- Employing landmarks as part of a wayfinding system is a method by which a particular pattern or route may be developed. For a landmark to be effective, it is essential that it contrasts with its environment, be located near strategic areas, and be noticeable to the average user.

- In addition to increasing a sense of location within a building, landmarks can also be developed as meaningful interactive elements within an overall design, which would assist the augmentation of sense of place.

**2.2.6 Design Guidelines**

The analysis of pathways, edges, districts, nodes and landmarks provides examples of how designers can break down the environment into recognizable pieces and therefore increase user orientation within the environment. The definition and description of these components highlights their linkage to one another, and classifies how any given environment may be perceived by its inhabitants.
<table>
<thead>
<tr>
<th>Element</th>
<th>Design Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pathways</td>
<td>• Increase visual access where possible</td>
</tr>
<tr>
<td></td>
<td>• Capitalize on connections (to adjacent areas) to increase identity awareness</td>
</tr>
<tr>
<td></td>
<td>• Use unifying characteristics where possible, space type, materials, colour, texture, pattern, lighting, etc.</td>
</tr>
<tr>
<td>Edges</td>
<td>• Create clear boundaries between areas, consider multiple methods by which this may be achieved</td>
</tr>
<tr>
<td></td>
<td>• Consider the detail where two edges intersect; high contrast at this point may be particularly effective</td>
</tr>
<tr>
<td>Districts</td>
<td>• Create a consistent characteristic that defines the area clearly, possibly in accordance with the use of space</td>
</tr>
<tr>
<td></td>
<td>• If further definition is required, identify the area with a cohesive use of space type, materials, colour, texture, pattern, lighting, etc.</td>
</tr>
<tr>
<td>Nodes</td>
<td>• Allow for display of important wayfinding elements within this area</td>
</tr>
<tr>
<td></td>
<td>• Integrate or provide space for landmarks</td>
</tr>
<tr>
<td></td>
<td>• Allow for areas of rest or orientation</td>
</tr>
<tr>
<td></td>
<td>• Express the space type, materials, colours, textures, patterns, and lighting that are used in the surrounding areas</td>
</tr>
<tr>
<td>Landmarks</td>
<td>• Contrast with surroundings</td>
</tr>
<tr>
<td></td>
<td>• Locate near to strategic (decision point) areas</td>
</tr>
<tr>
<td></td>
<td>• Make interactive for users, to increase level of engagement</td>
</tr>
<tr>
<td></td>
<td>• Create a pattern, or consistency, to help form route identification</td>
</tr>
</tbody>
</table>

As important as these guidelines are, the criteria that define these models are not incontestable. It is quite likely that these classifications often overlap or are of dual nature in specific instances in the built environment. For example, a path can most definitely serve as an edge, or a node as a landmark. In any given environment, these principles may be perceived in different ways depending on the user. What these classifications do provide, however, is a starting point; a way to categorize and clearly define different areas of an interior so that its function in relation to wayfinding may be analyzed. As well, the clarification of these wayfinding components assists in understanding the ways in which individuals construct usable mental imagery of routes. This creation of a *map in mind* leads to the next topic of discussion, human cognitive mapping.
2.3 Cognitive Mapping

This section outlines aspects integral to the theory of cognitive mapping, with specific focus on mental imagery, sight, memory, individual differences, and scale. The concept of cognitive mapping is not a new one. It is based on the theory that people develop mental imagery of the elements of their environment, and subsequently arrange a mental representation that organizes and informs the way they approach and remember destinations.

Cognitive mapping differs from the wayfinding elements described earlier. An individual’s cognitive map is a system that helps organize environmental elements in a meaningful way. The key wayfinding elements described in the last section serve to quantify and qualify the fundamental components that help the average user create important markers for the development of a cognitive map.

To understand cognitive mapping further, Downs and Stea (1973) have attempted to quantify the process of cognitive mapping in a scientific manner:

We are faced with four sets of variables:
1. the spatial environment itself;
2. the information of stimulus set;
3. the intervening cognitive processes; and
4. the group and individual differences in the operations of these processes... (p. 9).

By considering the phenomenon of cognitive mapping in this manner, it is possible to analyze any environment in a comprehensive way. The use of this straightforward approach allows the theory to be assessed, and provides examples of how the findings may be applied to design. Such an approach is warranted because an important goal of this practicum is to determine how cognitive mapping theory can inform our understanding of human wayfinding.

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7 A variety of sources are available regarding cognitive mapping. For further reading, prominent theorists include: Ann Sloan Devlin (2001), Roger M. Downs, David Stea (1973, 1977), and Kevin Lynch (1960).
2.3.1 Mental Imagery

To put it simply, cognitive mapping is "...a process composed of a series of psychological transformations by which an individual acquires, codes, stores, recalls, and decodes information about the relative locations and attributes of phenomena in his [sic] everyday spatial environment" (Downs & Stea, 1973, p. 9). The wayfinding components of paths, edges, districts, nodes, and landmarks (Lynch, 1960) that define any given environment provide evidence of the manner in which individuals may segment their environment into meaningful portions that allow them to create mental imagery.

The theory of cognitive mapping, or spatial cognition, is based on the universal mental “images” that humans create when imagining space. There is much debate about how the physical component (the brain) translates the environmental component (the space) to achieve successful navigation. Although this phenomenon occurs with some degree of similarity for most people, every individual creates their own cognitive map, unique to themselves (Downs & Stea, 1977).

According to Devlin (2001), one of the major aspects of human existence is the creating and acting upon of mental imagery. This process involves interpreting our environment, imaging a representation of it, and then predicting consequences of the image in relation to previous images created. As a widely held theory, this common manner of creating mental pictures provides interesting information for designers. A design approach that capitalizes on elements that are highly memorable may provide users with an environment that is easily understood and allows for independent navigation (Downs & Stea, 1977).

**Design guidelines for mental imagery:**

- Although any single approach may not provide the answer for how to trigger mental imagery in a user, it may be helpful to consider Lynch’s (1960) principles when formulating a strategy for wayfinding. By vigilantly constructing sets of paths, edges, districts, nodes, and landmarks in any given setting, it may be possible to create an environment that is easily understood by users.

- To reinforce these elements, the use of repetition, along with careful definition between major areas of a larger building complex, could likely provide the greatest measure of success.
2.3.2 Sight

Although every individual interprets and visualizes their environment differently, there is a common
relationship in the way in which all people see. Exploration of sight, in relation to various physical elements,
provides an interesting perspective on cognitive mapping, and it relates well to the topic of interior design.
This complex notion of sight is based on studies of the workings of the brain. Observations of reactions that
occur within the brain during the act of seeing provide some insight into the way the human brain creates an
image. Devlin (2001) asserts that the occipital lobe located at the back of the human brain is activated during
the act of seeing. This is important because when depicting an image in the mind: "...imagery engages [the]
visual cortex, whereas other tasks, many of which are highly similar save for the absence of visual imagery, do
not" (p. 143). These findings clearly relate mental imagery to the action of sight, which further illustrates the
visual nature of cognitive mapping.

It follows that as the formation of mental imagery and individual mental maps are influenced by
exterior sources, the possibility of informing mental imagery through the built environment may be controlled,
to some extent, by designers. It is therefore possible to approach interior design in a way that could allow for
greater ease of navigation.

Design guidelines for sight:

A potential approach to increasing sight cues may be to create interior landmarks or clearly
derfined areas that allow for the triggering of successful place recognition. This could be achieved in a
variety of ways. Although interiors that appeal to all sensory systems may be appropriate, the aspect of
mental imagery that is highly visual in nature suggests a customized approach. Creating spaces that are
visually appealing, diverse, or perhaps colour-coded may provide users with cues for place recognition or
understanding. As well, repetition of elements that are similar may serve to create patterns, and further
delineate a space.
2.3.3 Memory

The function of human memory is also integral to the understanding of cognitive mapping theory. In particular, the aspects of working* or short-term memory which are linked to wayfinding and particularly users unfamiliar with an environment will be covered in this section.

An interesting aspect of cognitive mapping theory is the study of visio-spatial working memory. According to Logie (1995), mental imaging is an important component of human cognition. There is the aspect of perception that takes in stimuli from the environment and internalizes the images, which are then stored as memory. During the completion of a variety of daily tasks, humans mentally represent a visual form of the objects in their environment (Logie, 1995). This internal representation differs from person to person, although the key wayfinding elements as outlined by Lynch (1960) serve as powerful examples of universal images.

Researchers Arthur and Passini (1990) explain this in relation to interiors:

Glancing or scanning is the perceptual technique used in buildings. When glancing, the eyes rest on an object or message for a very short period, usually less than a second, and the image obtained is held in a short term visual memory until it is translated into a memory of longer duration. The short term visual memory has limited capacity; if it is asked to absorb too many units of information, a bottle-neck may occur that jams the normal glancing mechanisms and impedes the intake of information. (p. 8)

It is evident that through our senses we determine the location of multitudes of objects in relation to ourselves and to other objects. More specifically,

Working memory is thought to pervade everyday cognition, to provide on-line processing and temporary storage, and to update, moment to moment, our representation of the current state of our environment and our interactions with that environment (Logie, 1995, p. 70).

This idea supports the notion of cognitive mapping as being a highly adaptive approach to environmental navigation and comprehension. It allows designers to understand that the system of cognitive mapping is one in constant flux — modified continually by the user, depending upon sensory input.

Additionally, many theories in cognitive psychology have established links between the processing of speech and speech output (Logie, 1995). Within this stream of thought, current studies are endeavoring to

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* Working memory: "...the amount of information that people can hold "in mind" at one time..." or "a temporary store holding just a small amount of information" Parkin, 2000, (p. 126, 128).
determine whether there is a substantial link between the visual-perception system and visio-spatial short-term storage. This proposed connection may explain the short-term nature of environmental image storage in the brain, which enables us to navigate effectively, but is limited due to the relatively brief time period during which this information can be retained. This generates an important question: if cognitive mapping is based on visual memories, does visual similarity among stimuli used for retention result in confusions of memory? Logie (1995) asserts that all evidence points to this being true, most particularly with images (spaces) that are unfamiliar.

Logie's assertion is important to note for interior designers because it suggests that spatial design, if not carefully considered, has the potential to be confusing. If environments are very similar in appearance, or so subtly different so as to appear similar, then the spaces may be very disorienting to first-time or regular users. Examples of public interiors that have these types of wayfinding hurdles in place include, but are not limited to:

- **schools**: which may have a very simple layout but little room for differentiation.

- **shopping centers**: which may have intentionally confusing pathways and may be planned in a counter-intuitive manner.

- **hospitals**: which may be quite large in size, contain additions accrued over many years, or have signage systems that are not current (Slater-Enns, 2005).

Any institution that is large and complex poses a challenge when designing for ease of navigation. Understanding visio-spatial working memory provides insight, however, because it suggests that careful attention to non-repetitious elements is necessary to create interior spaces that are easily understandable.

**Design guidelines for memory:**

To achieve memorable delineation of specific spaces or areas, elements such as a variety of colour, high contrast materials, or clearly marked signage may be helpful when trying to organize a readable space. Also important are landmarking and placemaking theory. By making areas of importance along a path memorable, designers can allow for more complete mental maps to be made by users thereby increasing the potential for dynamic image memories.
2.3.4 Individual Differences

A variety of studies have attempted to determine the spatial cognition abilities of a range of individuals. According to Downs and Stea (1973) general conclusions support that there are no concrete differences in the abilities of diverse sets of humans as they pertain to spatial cognition. Commonly, spatial understanding and recognition appear to improve with age, but differences between the sexes in wayfinding ability are not conclusive. To further clarify,

Cognitive maps are convenient sets of shorthand symbols that we all subscribe to, recognize, and employ; these symbols vary from group to group, and individual to individual, resulting from our biases, prejudices, and personal experiences (Downs & Stea, p. 9).

This statement stresses, once again, the universal nature of the cognitive process, but also makes clear that there is no one specific cognitive map that all humans experience. Interpreting this idea, it is certain that cognitive mapping is tied very closely to the act of learning. This would explain the tendency for spatial understanding and navigation ability to improve with experience.

Another interesting component of spatial orientation is the cognitive ability of identification of an environment when seen from a non-standard viewpoint. According to Ross (1974), “the easiest way to understand the relationship of various landmarks is to view them from above...” (p. 111). This change of viewpoint allows users to create a three-dimensional image of an area. According to her research, Ross has found that most children over the age of six are quite able to read and interpret aerial photographs. This expresses the human capacity for advanced spatial cognition from even a relatively young age.

The way people form cognitive maps and understand their surroundings are particularly important for interior design because the built environment must serve the needs of a variety of users. But these concepts also make clear the idea that there is no one strategy that is universal in its success. One can only contemplate general approaches that may assist users in the navigation of interior space, and perhaps carefully design those spaces for younger individuals who may not have highly developed cognitive mapping abilities.
Design guidelines for individual differences:

- A method that may increase wayfinding efficiency is the inclusion of strategically placed plan or axonometric views of areas that may pose navigational difficulty. If executed correctly, the different perspective gained from a map may enhance the understanding of the built environment.

2.3.5 Scale of Mental Maps

As stated previously, internal spatial and distance mapping representations of the mind are a universal human phenomenon, although there are differences in the mental imagery that is created for each individual. The manifestation of cognitive maps in individuals has applications for all environments, from small interiors to large open spaces that are difficult to navigate.

Another key aspect of cognitive mapping is that individuals quite often organize their surroundings into a hierarchy that segments the environment into decipherable pieces. Usually highly visual in nature, this subdivision is unlike a two dimensional map, but remains understandable to a great many people. As Downs and Stea (1973) note:

An interesting example of such hierarchical structure concerns the degree to which the fineness of the hierarchization for a specific schema is dependant upon the location of the observer: it seems highly likely that we tend to subdivide areas closer to us in space in much greater detail than areas further away. We tend to project this aspect of schemata on to other people when communicating with them (p. 164).

This is a useful point because people appear to be able to describe not only their own individual cognitive maps to others, but also to be able to segment them in ways that are accessible for understanding by most people. It confirms that a systematic approach may serve to assist a significant proportion of users, if not all.

In addition, Lynch's (1960) key wayfinding components describing cognitive maps are universal in the formation of cognitive images and are closely linked to scale. They serve as a description of how people split environments into smaller segments. By stressing the importance of dividing up larger spaces into smaller areas that may be effectively understood by a navigating user, Lynch's principles can be used as helpful guidelines when designing for wayfinding success.

* A type of drawing that represents objects in 3D. Vertical lines are drawn to scale, but the drawing retains a slight distortion - differing from that of a perspective view.
The use of smaller areas to define larger wholes is already employed, intuitively, to some degree in public spaces, orienting similar activities in similar areas. A shopping mall is an excellent example. Although the placement of food services in one location fosters competition and business, it also serves to segment an individual space within a larger space. This linking and definition of specific areas may be a way for interior designers to acknowledge the way in which humans subdivide and understand their relationship to space. Examination of both the macro urban and micro interior environments will provide multiple contexts to help designers synthesize this information in an integrated way.

**Design guidelines for the scale of mental maps:**

To design in accordance with the way that humans assign order to their environment, it is important to create areas (within a larger set of buildings) that are discernable as units. This grouping of larger environments into memorable pieces may provide users with a way to remember a larger overall area. Additionally, when considering the design of the smaller scale sections of the environment, it could prove useful to design elements that are simple to describe. By creating clear landmarks (e.g. the orange canopy), the description of areas between users could be assisted. Wayfinding cues that are designed with the intention of being describable in a straightforward verbal manner could be quite helpful for users receiving direction from others.

2.3.6 Design Guidelines

By capitalizing on the methods by which humans imagine, see, recall, and universally organize environmental information, it may be possible to predict behavior, rather than simply react to it. It is evident that designers must consider the importance of spatial differentiation, the practice of landmarking, or placemaking, in order to achieve user wayfinding success. Thorough analysis of *cognitive architecture*, or the built elements that may be used to provide emblematic meanings to the user, designers could provide an unspoken commentary through physical form.
**TABLE 3: Design Guidelines for Cognitive Mapping Elements**

<table>
<thead>
<tr>
<th>Element</th>
<th>Design Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental Imagery</td>
<td>• Articulate areas according to path, edge, district, node, and landmark guidelines</td>
</tr>
<tr>
<td></td>
<td>• Reduce instances of repetition</td>
</tr>
<tr>
<td></td>
<td>• Clearly demarcate between different building areas</td>
</tr>
<tr>
<td>Sight</td>
<td>• Place/landmark creation is important</td>
</tr>
<tr>
<td></td>
<td>• Employ diverse (simple), visually appealing, perhaps colour-coded cues</td>
</tr>
<tr>
<td>Memory</td>
<td>• Provide landmarks that users can engage with</td>
</tr>
<tr>
<td></td>
<td>• Use high contrast colours, materials, and signage for spaces and areas of importance</td>
</tr>
<tr>
<td>Individual Differences</td>
<td>• Strategically place plan or axonometric views of environment to assist spatial understanding</td>
</tr>
<tr>
<td>Scale of Mental Maps</td>
<td>• Group larger areas into cohesive units (uniform application of interior elements)</td>
</tr>
<tr>
<td></td>
<td>• Design landmarks with ease of verbal description in mind</td>
</tr>
</tbody>
</table>

With careful consideration of the components of spatial cognition, interior designers may be able to create spaces that not only appeal to inhabitants, but that respond to the ways in which users think about them internally. With further research, it may be possible to create spaces with definitive paths that mesh well with the ways in which humans define pathways, and further increase interior wayfinding success.

### 2.4 Placemaking and the Use of Landmarks

The act of placemaking is a universal activity. Frequently described in urban design philosophy, "Placemaking is not just about the relationship of people to their places; it also creates relationships among people in places" (Schneekloth and Shibley, 1995, p. 1). Placemaking is a significant method by which designers can provide users with a way to engage and identify with their environment. Although a lofty goal for any public setting, it may be possible to achieve successful placemaking through interior design. As Schneekloth & Shibley (1995) explain, allowing for user placemaking “…offers a unique public space in which to weave a web of relationships that interact to create a common world” (p. 142). It would seem that the goal of placemaking
is to allow for people to have a meaningful relationship with their surroundings by creating opportunities for them to engage directly with their environment and each other.

Traditional hospital environments may have inherent characteristics that are detrimental to positive place formation. The institutional elements of a majority of hospitals may carry with them a traditional association with sickness and disease such as unfamiliar medical equipment and generic colour palettes. With the introduction of encouraging placemaking elements, the hospital can become a place of healing and wellness. For wayfinding, the dialogue that placemaking strategies create acts as symbols for users as well as discrete material locations (Schneekloth & Shibley, 1995). If it is possible to create environments that people identify with in a meaningful way, it may enhance peoples’ ability to recognize and understand the built environment in relation to these anchor point areas.

2.4.1 Design Guidelines

To facilitate successful placemaking, every aspect of the environment being designed must be considered. Creating places that are meaningful for users may be achieved in a variety of ways. Some examples of how this might be achieved for the HSC are the following:

- layering of detailing to incorporate meaningful elements (tradition, style, landscape)
- introduction of traditional elements even in mostly modern spaces
- colours that correspond to Canadian geography
- development of a welcoming atmosphere at the William Avenue & CSRP entrances
- utilization of public spaces to create a bright communal environment
- use of a rich composite of individual design details to create a feeling of substance; an overall effect of texture, diversity, and even a sense of history (Rapaport, 1998).
3.0 Precedent Review

There is a great deal of information on elements and types of environments that facilitate interior wayfinding. Commonly found examples include signage, textural cues, colour, and lighting. The following section describes the strategies used most frequently to assist interior wayfinding, and shows existing environments with associated wayfinding critique.

3.1 Examples of Wayfinding Strategies

**Signage:** Environmental graphics are the signs and other graphic schemes that help people locate and understand the services, destinations, and activities in a space (Urban & Environmental Graphics, 2003). As an effective tool for navigation, signage serves to reinforce a set path, and confirms for users that they are on the correct route. Difficulties occur when signs are used in very complex facilities, where multiple messages are displayed in one area. In such cases, signage may actually confuse the user.

According to wayfinding specialist John Sellors (Personal communication, January 2004), who has practical experience with the HSC site, the major challenges faced by designers of wayfinding systems are determining what graphic approach provides the most clarity for the greatest amount of users. Currently, the HSC Capital Planning and Construction department identifies areas that have a complex array of signage by spacing messages into groups of three, using the repetition of a particular communication along a particular path to reinforce a sense of direction, or route.

**Textural cues:** Textural cues are used in different ways. Most notably, they serve to help guide users with visual impairment. According to Dion (1999), “a detectable warning surface is a different floor texture that lets people with visual impairments know that they are about to reach the stairs”. This type of messaging system, used most often as a warning for hazardous areas, can provide for a variety of other indications. Differences in the pattern of flooring and wall materials may be used to indicate the edge of or type of space, but could also provide notification of decision point areas, where the route or path varies in direction. This system is helpful not only for creating environments that are universally accessible, but also provides an opportunity to cue sighted users as to a specific path or route change.
Colour: Separate areas of any given facility may be colour coded. This attempt to construct a visual pattern may not be valuable for all users. According to Malkin (1984), “The average person...does not notice or remember colour unless it is associated with form, such as a red apple” (p. 111). Also, the available range of discernable colour for most users is limited. Beyond the eight vibrant reds, oranges, yellows, greens, blues, browns, blacks, and purples that are easily discernable, a comprehensive wayfinding strategy in complex environments must not be limited, and a clearly differentiated colour scheme may not be possible (Sellors, Personal communication, January 2004). As disparity exists in the findings as to the effectiveness of colour in interior wayfinding, it, alone, cannot be used as a successful wayfinding method.

Lighting: Lighting can be used in ways that are directional, and that are noticeably different for each new destination point. It can also be used to accentuate an individual's awareness of their environment. In the case of Vicki Scuri's (1994) Seattle bus tunnel, "bright lights are used to help riders see their place in the tunnel, orienting themselves to the streets above, so as to decrease disorientation and discomfort that the travelers often feel" (p. 75). This orientation can further be achieved by exposure to daylight, which assists users in navigation and sense of direction.

Lighting can also be used as a very subtle form of wayfinding cue, not apparent to all users. When designing areas with the intent of leading users along a specific path, variation of lighting cues can actually reinforce a particular directional movement throughout a space. Given the choice of two pathways, individuals will instinctively choose the brightest path (Sellors, Personal communication, 2004). It is apparent that the use of lighting in relation to wayfinding strategies is a subtle art. When used together with other approaches, it may provide for greater navigational success.

Redundant cueing: Redundancy of cueing is a wayfinding strategy that aims to combine a variety of signals to create a more complete and comprehensive guidance system. As Carpman (2000) notes,

Different people may favor different wayfinding strategies and may use a variety of strategies depending on the situation. This is one reason why "redundant cues," giving the same information in different ways, are an important part of a wayfinding system.

This approach supports a systematic, thorough response to the many ways in which different users may navigate a space. For the HSC, this strategy is manifested through recovery signage, which is placed 40-50 feet beyond the major information areas, for those users who may not have noticed initial messages (Sellors, Personal communication, 2004).
Although the tactic of layering wayfinding elements is an attempt to achieve the greatest amount of wayfinding success, there is a possibility that the very act of filling a space with multiple cues may be confusing to a building’s users. O’Neill (1991) explains the phenomena in relation to signage: “...in some settings signage enhances wayfinding and reduces confusion and stress, but in other cases it may be ignored completely” (p. 555). This implies that additional methods used in conjunction with signage may prove valuable for wayfinding success.

It is realistic to surmise that there are aspects of volume and form that may provide recognizable elements in interior environments, increasing the possibility of user orientation. Although redundancy of cueing is a valid method for wayfinding strategy, this practicum provides an approach that integrates the best examples of environmental cueing in a systematic manner.

3.2 Precedent Analysis

This section explains precedents that demonstrate wayfinding design. The examples range from a large urban environment to a small scale hospital interior. As can be seen in the following precedents, taking into consideration the various wayfinding elements discussed throughout this practicum is essential for an effective analysis of existing designs.

3.2.1 General Precedents

Example 1:

FIGURE 8: Triplan Design Illustrations
**Name of project:** Milan: A Ground to be Shared. From the Canadian Dawn: Canadian Designers for Milan Competition, 2003.

**Site:** The City of Milan

**Designers:** Triplan Design of Montreal.

**Key features:** This project was a wayfinding proposal that used strategically placed tiles to guide visitors to key areas within the city (Figure 8). Based on points of reference following the subway line, the project proposed to set tiles into the pavement to communicate the qualities and meaning of the nearby points of interest (Canadian Interiors, 2003). This definition of important areas relevant to Milan's history and modern life created a "...spontaneous itinerary, beyond the physical limitations [of the space]" (Centro Metropolitano de Diseño, 2003).

**Relevance for the HSC:** This example (with slight modification, perhaps integrated with tactile flooring strategies) could be implemented easily into any healthcare environment. By providing descriptions of specific areas of a hospital, this engaging approach could serve to orient users in an articulate manner. The urban strategy is easily applicable to an environment such as the HSC because it consists of a number of destinations situated on a variety of streets. For the HSC, it would not only supply indication of the key destination points, but also inform users of the identity of other areas of the hospital as well. It follows that the greater the understanding of the entire environment, the greater the chances for wayfinding success within that environment.

**Example 2:**

![Figure 9: Art as Landmark](image)
Site: The new Terminal 1 at Toronto Pearson International Airport (TPIA).

Designers: Airport Architects Canada (Adamson Architects, Toronto; Skidmore, Owings and Merrill LLP, New York; and Moshe Sadfie Associates, Montreal).


The highlight of this precedent is the use of art to create space identity within an extensive built environment. Architect Moshe Sadfie (McKenzie Galvez, 2004) proposed that there is a new era in design, "...moving away from art seen as embellishment and into a more integrative concept" (p. 43). This renovation scenario is greatly applicable to the wayfinding debate, as it provides an example of how spaces may be modified to have greater impact, while illustrating an approach that may be implemented over time (McKenzie Galvez, 2004, p. 43).

The art used in TPIA was carefully constructed by individual artists who respond to the site specifically for the greatest incorporation within the built environment. Key areas were chosen by airport officials, and the resulting art pieces serve to define each space in a unique, memorable way. Shown in Figure 9 is the work of Sol LeWitt's Wall Drawing #1100. The colourful geometric piece elevates an escalator bay into the monumental and memorable realm of living sculpture. The intent of the project is for the users of the space, engaging with the art through use, become part of the artwork itself (McKenzie Galvez, 2004).

Relevance for the HSC: As a precedent for this practicum, the use of commissioned art as space identifier provides an excellent example of an innovative wayfinding strategy. This approach could allow for the exposure and use of local artists, endowing the built environment with the expression of contextual ideas and talent. Besides providing vibrant and engaging interiors, the artwork could serve to create meaningful spaces within the HSC interior, triggering memory and place recognition.
Example 3

**Figure 10: Hospital Landmark**

**Name:** University Health Network's Clinical Services Building

**Site:** Toronto General, Toronto Western, and Princess Margaret Hospital, Toronto, Ontario.

**Designers:** HOK Architects and Rice Brydone Ltd.

**Key Features:** The former entrance piece of the Thomas Bell building is used here as an art piece in the four storey patient lounge area (see Figure 10). The portico, displayed in the centre of the large space, serves as a meaningful landmark for users, past and present. The historic stone entrance marries the old with the new in an engaging way, providing an example of how previous notable elements of the structure can be maintained to provide a sense of connection, or a glimpse of the history of the hospital itself.

This design also uses colour as an overall space enhancer, mainly through flooring. As artwork incorporated on vertical surfaces proved to be cost prohibitive, colourful abstract graphic flooring was included in the project. The flooring artwork, although very aesthetically appealing, was also designed to be seamless in nature, to prevent any possible spread of infectious disease. The flooring is finished by climbing the walls and carefully protected against edge cracking with guards.

This approach serves a wayfinding function as well. As the facility was a maze of multiple buildings, careful consideration of flooring cues that highlight particular areas, such as nursing stations, was implied with geometric patterns. The connection of specific shapes to specific areas serves to create a path that leads from the exterior to specific spaces within the hospital (Donnelly, 2003).
This building provides an abundance of natural light, with a great deal of visual access to exterior for patients, staff, and visitors. Recognizing environment as an influence in wellness, the colour palette is warm and inviting, shifting from traditional institutional colour schemes of the past. Calm and tranquil, inviting and full of light, the Robert R. McEwen Atrium of the building transcends the typical feel of a hospital setting (Donnelly, 2003).

Relevance for the HSC: The example is relevant for the HSC on a number of levels. Firstly, the recognition of the historic significance of elements may have meaning for users. It illustrates the importance of acknowledging context to help users to understand a space. Secondly, graphic flooring is used to creatively define areas, providing an important differentiation between these areas. Thirdly, colour and natural lighting is employed to reinforce a positive healing environment for the users.

Examples 4 & 5

![Example 4 - Pfizer Building Hallway](image1.jpg)

**FIGURE 11:** Example 4 - Pfizer Building Hallway

**Name:** Pfizer Building Child-care Facility

**Site:** New York, New York

**Designer:** Martin E. Rich Architect
**Name:** The Copper House - childcare facility for Husky Injection Moldings Systems employees.

**Site:** Bolton, Ontario, Canada.

**Designers:** Anita Rui Olds, Jacobson Silverstein Winslow/Degenhardt Architects, Woodacre, Cal., and Carla Mathis.

**Key Features:** The above examples display interiors that utilize volume and shape to aid the wayfinding process. Both environments articulate corridors in such a way as to provide cues which assist the viewer in determining their location. The hallway of the Pfizer childcare facility (see Figure 11, p. 40) illustrates the effectiveness of this approach. The "wavy" ceiling form creates a sense of direction within the hallway, indicating that the hallway is a walking path.

The second example of space that indicates direction through the use of both form and volume: the hallway of Copper House (see Figure 12, this page), a progressive childcare facility. This particular corridor simulates a sense of movement along an established path, and yet the user is connected visually to other areas, with access to natural lighting and a warm, welcoming atmosphere. This particular design reduces the sense of isolation that often exists in some hallways with less directional cueing.

Further exploration of volume and form combined with other approaches may yield findings that will help designers create spaces that are easy to navigate within. As maintained by Carpman in her online wayfinding website, interior design is critically important to wayfinding.
The creative talents of designers can result in unique-looking places, which can act as “landmarks” to help patients and visitors find their way. Landmarks are places that seem different in some respect from the areas around them. People might not even be able to articulate exactly how they seem different but they know that they are (Carpman, 2000).

Relevance of Examples 4 & 5 for the HSC: These two pathway precedents provide examples that stress the importance of considering every aspect of the built environment with respect to wayfinding, no matter how inconsequential. Every interior can express its function to users, and provide opportunities for memorable elements. These strategies provide excellent examples for the HSC, which consists of a grouping of buildings that are linked together by a large variety of interior corridors.

Summary: These precedent studies provide excellent examples of innovative approaches to wayfinding elements. The examination of these projects illustrates various approaches to wayfinding, and has provided ideas that are valuable for this project. It is clear that the use of traditional wayfinding approaches combined with art, innovative flooring, historic elements, and various uses of volume and form can provide inspiration for rich navigational components which can be implemented in the design phase of this practicum (See overview, Table 4).

<table>
<thead>
<tr>
<th>Example</th>
<th>Wayfinding Class</th>
<th>Ceiling/Lighting</th>
<th>Floor</th>
<th>Walls</th>
<th>Materials</th>
<th>Determinants of Wayfinding Success</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) City of Milan</td>
<td>Path/Landmark</td>
<td></td>
<td>Patterned tiles indicating path</td>
<td>Inlaid tiles</td>
<td></td>
<td>• Strategy effectively integrates ground level cuing with signage and path markers</td>
</tr>
<tr>
<td>2) TPIA</td>
<td>Node/Landmark</td>
<td>Skylight &amp; dramatic ceiling forms juxtaposed w/ high contrast abstract art</td>
<td>Neutral flooring</td>
<td>Single tone refined wall surfaces</td>
<td>Steel structure w/ drywall finish &amp; glass accent detailing</td>
<td>• Strategy creates highly memorable element</td>
</tr>
</tbody>
</table>
3.2.2 HSC Case Studies

The following case studies are specific to the HSC. The wayfinding elements found in each example have been analyzed in a similar manner to the general precedents (see: Table 5, p. 65). Whereas the general precedents provide examples of successful wayfinding strategies, the HSC case studies serve to highlight examples of both wayfinding successes and areas that could be improved.
Example 1

FIGURE 13: HSC Path

This path contains both positive and negative wayfinding elements. The right side of this image shows the unique treatment of the Pedway Café area, which creates a recognizable and memorable wayfinding cue. The neutral palette of the remainder of this environment (ceiling, flooring, walls), however, does not provide a great deal of wayfinding information for the user. The distant signage is also difficult to read.

Example 2

FIGURE 14: HSC Edge

This edge precedent at the HSC is a fairly effective one. However, the ceiling and floor treatments could use some improvement in terms of streamlining the visual cueing and providing directional indicators. The wall surfaces use form and materials to clearly indicate the separate identities of the connected spaces, but do not inform the user about the use of the space as a walkway. In other words, it appears that there are perpendicular hallways branching off of the main walkway.
Example 3

The above example is a segment of the Thorlakson Building at the HSC. This district, while consistent in form and colour has a very non-descript visual appearance. The neutral flooring and walls are so similar as to be indistinct. The introduction of contrasting elements such as variation of spatial form or the addition of new colours could serve to create a more dynamic set of spaces.

Example 4

This node at the HSC's William Avenue entrance has a number of issues that need to be resolved for increased wayfinding success. Part of the reason that it is currently so cluttered is due to the fact that it is used as a project explanation area for the new CSRP area during construction. As well it is the current location for a number of newspaper vending machines. It would serve users well to move these to another location, thereby streamlining the visual environment upon entry. Varied ceiling, flooring, and wall treatments could serve to create a memorable location for user orientation.
Example 5

This landmark is memorable solely for the fact that it greatly contrasts the areas surrounding it. Just off the path of travel (see space in site, Figure 15), this seating area alcove is clearly defined with vibrant murals. This area could be further improved with additional design articulation of the flooring and ceiling, perhaps evident from the main corridor.

Examples 6 & 7

Figures 18 and 19 illustrate the existing sitemaps found at the HSC. These “Map displays are not aligned to correspond to what people see around them in the building and do not display a clear “you are here” message” (Arthur & Passini, 1990, p.8). These are key examples of environmental elements that can confuse the user. The HSC maps are not: a) consistent in appearance; b) current; and c) easily legible. The maps also fail to portray the spaces of the HSC as they really are.
## 3.3 Design Guidelines

<table>
<thead>
<tr>
<th>Example</th>
<th>Wayfinding Class</th>
<th>Ceiling/ Lighting</th>
<th>Floor</th>
<th>Walls</th>
<th>Materials</th>
<th>Determinants of Wayfinding Success</th>
</tr>
</thead>
</table>
| 1       | Path             | Standard ACT w/ suspended signage & fluorescent lighting | Neutral tile, directional pattern | Pedway Café accented with stainless steel elements (columns) | Standard building materials set w/ stainless steel used to highlight | • Stainless steel elements clearly mark space difference  
• Other aspects of this pathway require further articulation such as directional ceiling and flooring treatments  
• Information gaps evident (hard-to-read, distant signage) (Arthur & Passini, 1990, p.8) |
| 2       | Edge             | Standard ACT w/ suspended signage, fluorescent & recessed lighting | Neutral tile | Wall surfaces are uniquely articulated | Variety of materials are used, serving to differentiate spaces well | • Highly successful edge formation  
• Possible improvements could involve directional flooring or ceiling applications |
| 3       | District         | Standard ACT w/ suspended signage, fluorescent lighting | Neutral tile | Neutral tones, no variation from one area to the next, w/ exception of mural shown in Fig. 15 | Application is non-descript | • Uniformity of application serves to define entire bldg  
• Lack of contrast creates muddy visual image  
• Distinct aesthetic, warm/welcoming/engaging could be developed to improve the environment |
**TABLE 5: Analysis of HSC Precedents (continued)**

<table>
<thead>
<tr>
<th>Example</th>
<th>Wayfinding Class</th>
<th>Ceiling/ Lighting</th>
<th>Floor</th>
<th>Walls</th>
<th>Materials</th>
<th>Determinants of Wayfinding Success</th>
</tr>
</thead>
</table>
| 4       | Node              | Standard ACT w/ signage | Neutral tile | Clerestory windows w/ variety of signage and vending | Natural materials for wall application, obscured by signage | • Node contains extraneous information  
• Area requires streamlining to improve user orientation  
• Surplus information leads to confusion (Arthur & Passini, 1990, p.8) |
| 5       | Landmark          | Standard ACT w/ suspended signage | Neutral tile | Vibrant murals, w/ seating | Non-descript | • This is a memorable landmark area  
• Further articulation of flooring and ceiling, perhaps into hallway could further notify users of this location |
| 6 & 7   | Site plans        |                   | Placed at decision points | Computer print-out, plastic cover | | • Colour-coding off, orientation incorrect (needs revision).  
• Inconsistent out of date versions |

**Summary:** Through a critical analysis of selective of the existing wayfinding areas at the HSC, it is evident that there are a number of strengths and weaknesses related to the site. The HSC precedent chart outlines areas that could be improved upon, specifically relating to floor and ceiling treatments. This examination also provides a look at the previous wayfinding strategies, and clarifies the requirement further design exploration.
4.0 Site and Building Analysis

The original intent of this practicum was to investigate and design for the wayfinding requirements of the Critical Services Redevelopment Project (CSRP) at Winnipeg’s Health Sciences Centre. After reviewing the extensive wayfinding strategies that were incorporated into the project’s planning, it became evident that the focus of this study might be better shifted to the areas that connect the new building with the rest of the hospital. It was apparent that there was a need to address the ways in which the wayfinding systems of the site, as a whole, could merge with the CSRP strategies.

For this practicum, the site is located among a multi-block group of buildings. Currently, the main HSC wayfinding approaches consist of: a) an extensive set of signage systems; and b) a colour scheme that designates separate buildings with a specific colour. Because of the overall complexity of this site, initial assumptions may cause users to view the task of interior wayfinding as overwhelming. However, according to hospital planning staff, every effort has been made to provide a cohesive set of wayfinding elements (Shea, Personal communication, 2003).

As with any wayfinding system, inevitably, there are methods that may be improved upon. Through discussion with practicum committee member Jason Kasper, who was also a member of the CSRP design team, it became apparent that the CSRP building had included a very comprehensive set of wayfinding elements, which are described in subsequent sections of this document. The following site analysis and description help define the areas in need of attention, clarifying ways in which an integrated wayfinding system may increase user understanding of the environment, especially in a renovation situation.

4.1 Facility Overview

Main Hospital Address: 820 Sherbrook Street
Winnipeg, Manitoba
Canada, R3A 1R9
www.hsc.mb.ca

CSRP building designed by: Smith Carter Architects and Engineers

CSRP Interior Design Consultant: Jason Kasper
The Winnipeg Health Sciences Centre is located on 32 acres of land in central Winnipeg, Manitoba, Canada (HSC, 2002-2003). Officially established in 1973, the HSC is an amalgamation of four healthcare institutions, which include the following:

1. The Winnipeg General Hospital
2. The Children's Hospital of Winnipeg
3. The Manitoba Rehabilitation Hospital
4. The D.A. Stewart Centre (Respiratory Hospital) (HSC, 2002-2003).

The new CSRP is a 286,000 sq. ft. four-level addition to the hospital near the existing General Hospital entrance on William Avenue (HSC, 2002-2003). The CSRP acute care building is currently under construction, with a deadline for completion and opening of summer 2006. Given the size of the CSRP building and the surrounding facilities, this site is ideal for the study of wayfinding because of the complex arrangement of spaces and the variety of buildings that connect to one another.

Other important aspects of the site and buildings include the following:

1. The HSC is Winnipeg's largest teaching hospital and Manitoba's only level-one trauma centre (all major trauma emergencies).
2. The entire project is also being built with flexibility to grow with medical technology as it progresses and is eventually replaced.
3. The new building, located between Children's Hospital and the main HSC entrance at 730 William Avenue, will be connected to the rest of the hospital on every floor and to the William Avenue parkade across the street by a skywalk.
4. The upper two floors will house a 14-bed pediatric intensive care unit, a pediatric and adult burn unit, a surgical and a medical intensive care unit - all with 10 beds in each.
5. A 30-bed adult and pediatric post-anesthesia care unit, a 10-bed coronary care unit, central sterilization and processing facilities, and radiology procedure rooms complete the building (Rabson, 2004).
4.2 Context

Figures 20-28 illustrate the manner by which the HSC has developed, building by building. This amalgamation of buildings, over time, has resulted in a site suitable for wayfinding analysis and redesign.

**AREA HISTORY: Growth of site (1875-2000): blue areas indicate new buildings**

4.3 Climate

The city of Winnipeg has diverse seasons which include warm, sometimes humid summers with temperatures that can reach +35° Celsius and cold dry winters, which can have temperatures as low as -40° Celsius. The broad climate range is attributable to North-Western and Southern winds which bring in a great variety of weather systems. The sun patterns of the area are typical of a Northern location, receiving a high amount of sunlight during the summer months and low levels during the winter season.
For this project, the affects of seasonal weather variation are most important for areas that are in direct contact with the elements, such as main entrances to the buildings. Requirements for appropriate insulation, glazing, tinting, and air-lock areas must be addressed when considering the cohesiveness of wayfinding design as a whole. In this practicum the well-established entrances will not be altered even though an ideal wayfinding strategy would address the possibility of re-design.

4.4 Natural and Built Environment

The physical geography of the area is very level, and the landscape consists of a variety of buildings with trees and parking lots interspersed, not unlike a standard Winnipeg cityscape (see Figure 29).

There is no one consistent appearance to the area, as it consists of a landscape formed incrementally over time. This exterior variety provides an opportunity for the design of a wayfinding system because the wayfinding strategy may need to reference the exterior environment to create a sense of order for the spaces.

4.5 Amenities

The surrounding areas and city centre contain a variety of amenities which serve the users of the site, as well as the general population. They include:

- Parking lots including a variety of open and closed car parks, the most notable one for this project is located on William Avenue.
- Church to the West of the site
- Variety of housing units
- Restaurants
• Gas stations
• Financial institutions
• Florist shops
• Funeral home

It may be helpful for users of the HSC to have access to information regarding these external reference points. They could serve as landmark points that help ground users within the larger exterior environment.

### 4.6 Site Map

The location depicted (Figures 30&31) is the construction area for the CSRP building. Important areas for this project are the highlighted sections and those that connect to it, including the General Hospital, the Children's Hospital, the Thorlakson building, the University of Manitoba, as well as a variety of general amenities for staff, patients, and visitors.

**FIGURE 30: Site Plan**

**Connecting Buildings:** There are many key buildings in the area surrounding the CSRP building. The adjacent buildings and their connections are important to examine for this wayfinding study (Figure 31, p. 54). This HSC image identifies the major buildings and their connecting routes.
FIGURE 31: HSC Connected Buildings

4.7 Circulation

The circulation to and around the site is pedestrian and vehicular. For the purposes of this practicum, pedestrian access to the site will be the main focus (Figure 32, p.55). The major circulation areas depict highly used areas that are suitable for a closer study of wayfinding needs.
The new design needed to take into account previous and current user behaviors/habits. Although the William Avenue General Hospital entrance traffic volume will be reduced from its current level, it will remain a prominent circulation and landmark point (J. Kasper, Personal communication, April 2004).

4.8 Areas to be Designed

After studying the main circulation areas for the hospital, and carefully considering the areas that link the new CSRP building to the rest of the site, the following areas (Figure 33, p. 75) were selected as those that could benefit from further wayfinding analysis.

- **Path 1**: West section of Pedway, leading to the Psychealth Centre
- **Path 2**: Major entrance from point from the William Avenue parkade
- **Edge 1**: Busy thoroughfare linking distinct areas
- **Edge 2**: Provides opportunity to examine how a simple hallway can be improved for wayfinding success
• **District**: Destination point within the hospital

• **Node 1**: Major entrance off of William Avenue (connects multiple user routes)

• **Node 2**: Major point of decision for wayfinding (both vertically and horizontally)

• **Landmark 1**: Major atrium area; allows for meaningful design space

• **Landmark 2**: Opportunity for memory cueing along a busy corridor

Generally, the areas selected represent the range of wayfinding element categories as described by Lynch (1960). Figure 33 shows the areas to be designed and the corresponding square footage per area calculations.

4.9 Spatial Character

Aside from the previously mentioned wayfinding strategies within the hospital as a whole, the new CSRP building includes a strategy based on the elements of nature. This strategy is intended to create a specific feel for each level of the building, as well as define individual wards from one another. Through colour, floor patterning, lighting design, and iconographic elements such as artistic murals, each area aims to provide subtle division from one another. In addition, many spatial elements serve as area identity markers, such as nurses’ station bulkheads, flowing wall construction, and atrium main areas (J. Kasper, Personal communication, April 2004). Table 6, page 57 outlines the ways that these elements are arranged.
### TABLE 6: CSRP Spatial Character Strategy: growth/seasons/regeneration

<table>
<thead>
<tr>
<th>Floor Level</th>
<th>Colours Used*</th>
<th>Intended Character</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower</td>
<td>Earth tones</td>
<td><strong>Roots:</strong> Variation of lighting and colour stated below applies</td>
</tr>
<tr>
<td>Main</td>
<td>Blues &amp; greens</td>
<td><strong>Water:</strong> Lighting elements and floor patterns used are representational of water craft, pediatric areas contain more literal interpretations, adult areas contain abstracted versions. Additionally, colour application is slightly more saturated in pediatric areas, with a muted palette for adult areas</td>
</tr>
<tr>
<td>2nd</td>
<td>Greens, oranges, &amp; browns</td>
<td><strong>Earth:</strong> Variation of lighting and colour stated above applies</td>
</tr>
<tr>
<td>3rd</td>
<td>Blues, purples, &amp; greens</td>
<td><strong>Sky:</strong> Variation of lighting and colour stated above applies</td>
</tr>
</tbody>
</table>

*Higher intensity colour is located in pediatric areas; more subdued colour palette in adult areas*

In addition to the items outlined in this chart, the CSRP areas are defined by:

- variation in the treatment of columns (blue for pediatric, burgundy for adult).
- use of water elements as part of a cool colour palette to soothe users, with warmer colours used to provide comfort in procedure areas.

As stated previously, with these considerations for wayfinding addressed, it appeared most feasible to focus the design towards the areas that connect the CSRP to the rest of the hospital complex. This provided a scenario that allowed for the design to complement, or lead to these spaces, thus resulting in a greater overall benefit in the design exploration. To create an integrated approach to wayfinding for other areas of the hospital, it was helpful to complement the wayfinding approaches set out for the CSRP building, creating a cohesive system that links the variety of areas together.
4.10 Existing Wayfinding and Signage

The HSC has a carefully outlined approach to wayfinding and signage. The specific requirements for this system, according to Laura Shea, Senior Project Officer of the HSC's Capital Planning and Construction department (Personal communication, January 2004), are as follows:

- Wayfinding system must be very basic
- Signage must be placed at "reasonable" distances
- Must avoid "doubling up" of information
- Current Strategy is to compartmentalize specific areas
- Standardization of approach is key.

The existing HSC Wayfinding Strategies consist mainly of signage, and include the following types:

- Site Maps
- Building Directory Boards
- Clinic Directory Boards
- Interior Directional Signs
- Directional Graphics
- Door Signs
- Informational Messages
- Handicap [sic] Accessibility Signs
- Fire Extinguisher Location & Instruction Signs
- Neon Gas Signage
- Level Identification in Stairwells
- No Smoking Signage
- Exterior Building Signage
- Exterior Directional Signage
- Exterior "Projects Under Construction", & "Height Restriction" Signage
- Exterior Traffic Signs (Health Sciences Centre, 1992).

Table 7 synthesizes another layer of the existing HSC signage strategies.

<table>
<thead>
<tr>
<th>Type of Message</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life Threatening</td>
<td>Red with White Letters</td>
</tr>
<tr>
<td>Caution</td>
<td>Yellow with Black Letters</td>
</tr>
<tr>
<td>Handicap [sic]</td>
<td>White with Blue Letters</td>
</tr>
<tr>
<td>All other messages</td>
<td>White with Black letters</td>
</tr>
</tbody>
</table>
As well, the individually colour coded buildings have corresponding signage to differentiate one building from another.

It is important to remember for healthcare signage that it needs to be clear, avoiding the repetition of similar names, and positioned near eye level, or it will not be seen and possibly misunderstood by even the most aware users (Jeffrey, 2003). The existing site conditions (signage) are helpful when designing for further wayfinding strategies, as they provide a blueprint of the key areas and items that users require information about.

The site and building analysis provides information regarding context and existing wayfinding strategies. The design programme will augment this data with further analysis in relation to specific user requirements as well as considerations for the creation of an integrated wayfinding system.

5.0 Programme for Wayfinding

The following section contains a detailed pre-design foundation to aid in the wayfinding refurbishment of the areas in and surrounding the HSC's new acute care building. The intent was to provide an informative and useful guide that would highlight important design requirements while offering ideas to assist the transformation of the wayfinding related aspects of the outlined areas. In other words, the design programming purpose was to inform an integrated wayfinding strategy for the CSRP.

To augment the data provided in the site analysis, the programme outlines and assesses the specific aspects of the HSC site that will be used as models for the final design. Also included are profiles that detail the client, users, activities, functional and spatial requirements, design elements, and guidelines.

More specifically, the scope of this project included: major paths (leading to the building — from parking and other buildings, main floor areas of the CSRP building, and pertinent wayfinding links. These areas are categorized by Lynch's (1960) wayfinding elements of paths, edges, nodes, districts, and landmarks.
5.1 Client Profile (HSC)

The HSC is the "Largest health care referral, teaching and research Centre serving residents of Manitoba, Northwestern Ontario, and Nunavut" (Health Sciences Centre, 2003, p.4). The following values, vision, and mission statements describe the key goals of the HSC facility:

Values: To serve the community. "Quality, respect, integrity, compassion, public accountability" (HSC, 2003, p.1).

Vision: Achieving excellence, education and research. "Fostering innovative partnerships with urban and regional health authorities and with other providers, organizations and the community" (HSC, 2003, p.1).

Mission: "To enhance the health and individual well-being and dignity of residents of Manitoba and the surrounding regions through programs of patient care, professional education, and research" (HSC, 2003, p.1).

5.2 User Profile and Requirements

There is a variety of users of the HSC. The primary user groups include the following:

Patients: Residents from:
- Core area of Winnipeg
- Manitoba
- Northwestern Ontario
- Nunavut

Other:
- Students (areas of design focus are adjacent to lecture halls)
- Facility staff (Healthcare workers, maintenance staff, etc) (HSC, 2003)

As the HSC serves people who visit once, intermittently, and sporadically (undergoing tests, etc.), the wayfinding strategy must address the needs of those who are first time visitors to the space, as well as those who use the hospital environment more frequently.

Patient Population:

The HSC user population consists of approximately 33% children and 66% adults. However, roughly half of all children are newborns who would not benefit from a wayfinding solution. The emphasis on age specific considerations, therefore, would account for a population with 20% children and 80% adults.
Aboriginal Population:

The Aboriginal population of the HSC makes up approximately 25-40% of the entire patient base (Health Sciences Centre, p.3). This includes the Métis of Manitoba, Inuit from the Keewatin District of the Northwest Territories, and Aboriginal populations from Northwestern Ontario's rural areas (p.9).

General Requirements for the HSC's Population (items chosen for wayfinding relevance):

Items for this section are determined through analysis of the information contained in Table 1.

Human Factors Affecting Spatial Orientation:

- Clear, understandable wayfinding approach required (consistent expression of form), with key areas highlighted;
- High level of illuminations for key areas (in combination with non-glare materials);
- Any information provided must be basic and consistent; possibly using symbols and multiple dialects (multiple methods); and
- Reinforcement of sense of place required, allowing for user feedback.

Specific Requirements for the HSC's Aboriginal Population (items chosen for wayfinding relevance):

- Provisions for languages: language and dialect differences from English (interpretation/translation)
- 6 aboriginal (4 currently, also require Sioux and Dene) (Health Sciences Centre, p.9);
- Acknowledgment of lifestyle differences, particularly when coming from rural and isolated communities (cultural differences);
- Acknowledgment of lack of understanding of hospital culture, the pace of activity, procedures and approaches, and a sense of disconnection with this culture;
- Acknowledgment of feelings of loss of personal control and sense of hopelessness (Leskiw, 2001, p.7);
- Insertion of Aboriginal Services information at various points throughout the hospital;
- Inclusion of a comfortable and welcoming space for families within convenient locations; and
- Development of consistent signage and directions that are easy to read and recognize and usage of this signage in prominent ways as directional guides" (Leskiw, 2001, p.24).

10 For the purposes of this practicum, the term "Aboriginal" is used to describe all First Nations, Métis, and Inuit peoples (similar to the definitions outlined by HSC and St. Boniface General Hospital's Aboriginal Services departments).
User Activities/Behavior:

As there a variety of spaces that must be accounted for in this wayfinding design, the specific activities and behaviors related to each type of area are outlined in Table 8:

<table>
<thead>
<tr>
<th>Area</th>
<th>Specific Areas</th>
</tr>
</thead>
</table>
| Path 1 | • Major pedestrian travel - Main route for destinations of Psychealth Centre, Cadham Labs, Pedway Café, & University of Manitoba Bannatyne Campus. - Display reading & posting of notices  
• Resting/waiting - Use of telephones - *Artwork viewing  
• *Orientation location (recovery signage) |
| Path 2 | • Major pedestrian traffic to the CSRP building and hospital  
• *Orientation location |
| Edge 1 | • Major pedestrian travel - Main route for destinations: Medical Supply Store, General Store, CSRP, General Hospital - Rest areas  
• *Orientation location |
| Edge 2 | • Minor pedestrian travel - Route to Children's Hospital, CSRP, Thorlakson Building  
• *Orientation location |
| District | • Pedestrian travel - Destination point - Resting, waiting, and discourse w/ medical personnel |
| Node 1 | • Entry point- Major pedestrian travel - Decision making area  
• Resting, waiting, activity - Telephone use - Wheelchair pickup  
• *Orientation location |
| Node 2 | • Major pedestrian travel - Decision making area for General Hospital - Public/personnel vertical circulation, waiting, resting  
• *Orientation location |
| Landmark 1 | • Major entry point exterior & interior - Major pedestrian travel  
• Decision making area - waiting / resting - Services payment area  
• *Orientation location |
| Landmark 2 | • Major pedestrian travel - Decision point - Vertical circulation |
5.3 Functional Requirements

With respect to the CSRP, an integrated wayfinding strategy must also account for the fact that the CSRP is an *acute care unit*. According to HSC statistics for the existing Acute Care unit, between 2001-2003, patient stays averaged approximately 4.4 days in length (HSC, 2003). This average length of stay is relatively low when compared with other units at HSC. This is likely due to the fact that patients in acute care will be transferred to lower priority areas once their condition improves.

Unlike other areas of the hospital, such as general medicine wards, where occupancy is consistently at or above 100%, the acute care ward experienced an average of 83 percent occupancy in 2003. This may indicate that congestion in such areas of the hospital may not be as significant an impediment to wayfinding success as compared to more congested areas. However, the areas that connect the CSRP to the other areas of the hospital will likely see greater congestion and require attention to this challenge (HSC, 2003).

The HSC complex houses a variety of activities, including:

- Adult Emergency
- Adult Mental Health
- Anesthesia
- Child Health
- Child & Adolescent Mental Health
- Clinical Health Psychology
- Critical Care
- Diagnostic Imaging
- Medicine
- Oncology
- Rehabilitation Geriatrics
- Renal
- Surgery
- Women’s Health
- Also: diagnostic, ambulatory, and in-patient services (HSC, 2003).

With respect to wayfinding programming, it is necessary to plan for areas that serve as key orientation points for specific areas within the hospital. This is especially important for those areas that connect directly with the CSRP, as well as areas that serve as frequent points of origin for persons moving to an acute care ward.
5.4 Spatial Requirements

The ultimate design solution must allow for the complete design of a substantial interior space. Therefore, the image (see Figure 33, p. 56) outlines the areas assessed for the final wayfinding design. Each of these areas has its own set of strengths and limitations. In Table 9, there is a summary of the advantages and disadvantages, along with the general requirements for each area.

<table>
<thead>
<tr>
<th>Areas</th>
<th>Benefits</th>
<th>Constraints</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Path 1: Pedway</td>
<td>• Visual access to multiple areas &amp; exterior, daylight</td>
<td>• Uniform colour palette</td>
<td>• Adjacent spaces need further accentuation</td>
</tr>
<tr>
<td></td>
<td>• Area available for orientation, rest, telephone access</td>
<td>• Signage minimal and difficult to read</td>
<td>• Path requires a unifying characteristic</td>
</tr>
<tr>
<td></td>
<td>• Exposed façades clearly identify some areas</td>
<td>• Destination unclear</td>
<td>• Update of materials</td>
</tr>
<tr>
<td></td>
<td>• Columns available for signage display</td>
<td>• Ceiling non-defined ACT</td>
<td>• Use of form to accentuate sense of direction (ceiling)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Tile flooring anti-microbial characteristics not current</td>
<td>• High illumination</td>
</tr>
<tr>
<td>Path 2: Overpass</td>
<td>• Visual access to exterior, day lighting</td>
<td>• Width of corridor may constrain design outcome</td>
<td></td>
</tr>
<tr>
<td>Edge 1: Main Route</td>
<td>• Edges clearly defined and indicative of space use</td>
<td>• Visual landscape slightly cluttered: signage is lost</td>
<td>• Connection to hospital interior needs to be established</td>
</tr>
<tr>
<td></td>
<td>• Area available for orientation, rest, telephone access</td>
<td>• Destination unclear</td>
<td>• Unifying characteristics</td>
</tr>
<tr>
<td></td>
<td>• Columns available for signage display</td>
<td>• Ceiling non-defined ACT</td>
<td>• High illumination</td>
</tr>
<tr>
<td></td>
<td>• Large area available for orientation design</td>
<td>• Tile flooring anti-microbial characteristics not current</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Area becomes congested due to pedestrian/ wheelchair traffic</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Clear boundaries between areas</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• High contrast elements for orientation space</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Update of materials</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Use of form to accentuate sense of direction (ceiling)</td>
<td></td>
</tr>
<tr>
<td>Areas</td>
<td>Benefits</td>
<td>Constraints</td>
<td>Requirements</td>
</tr>
<tr>
<td>-------</td>
<td>----------</td>
<td>-------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Edge 2: to Children's Hospital (Picture not available - area under construction)</td>
<td>• Differing materials from one building to the next</td>
<td>• Size of hall restricts possibilities for extensive design intervention</td>
<td>• Distinct separation between areas&lt;br&gt;• Contrast at defining edges, change of material&lt;br&gt;• Destination identification required</td>
</tr>
<tr>
<td>District: General Hospital</td>
<td>• Area for sense of arrival&lt;br&gt;• Rest/waiting space available</td>
<td>• Neutral/non-descript colour palette (needs modification)&lt;br&gt;• Uniform colour palette&lt;br&gt;• Signage difficult to read&lt;br&gt;• Ceiling non-defined ACT, w/ bulkheads&lt;br&gt;• Flooring/walls lack definition&lt;br&gt;• Lack of privacy</td>
<td>• Consistent characteristics (space type, materials, colours, textures, patterns, and lighting)&lt;br&gt;• Adjacent spaces need further accentuation&lt;br&gt;• Update of materials&lt;br&gt;• Use of form to accentuate space</td>
</tr>
<tr>
<td>Node 1: William Ave. Entry Node</td>
<td>• Large, open area (space for landmarks)&lt;br&gt;• Space for rest/orientation</td>
<td>• Overload of signage/extraneous elements&lt;br&gt;• Uniform colour palette&lt;br&gt;• Destinations from this point unclear&lt;br&gt;• Ceiling non-defined ACT&lt;br&gt;• Tile flooring antimicrobial characteristics not current</td>
<td>• Space allocated for landmarks, rest orientation&lt;br&gt;• Expression of the interior types of surrounding areas&lt;br&gt;• Use of form to accentuate area&lt;br&gt;• High illumination</td>
</tr>
<tr>
<td>Node 2: Central Pathway Connection</td>
<td>• Area available for expansion&lt;br&gt;• Opportunity for landmark elements</td>
<td>• Three distinct areas without clear division between&lt;br&gt;• Large amount of signage displayed&lt;br&gt;• Colour palette uniform/non-distinct</td>
<td>• Space for landmarks, elements that define area differences&lt;br&gt;• Space for rest/waiting&lt;br&gt;• Clear difference in materials/form/lighting for each district area</td>
</tr>
</tbody>
</table>
TABLE 9: Wayfinding design areas/benefits/constraints/requirements (continued)

<table>
<thead>
<tr>
<th>Areas</th>
<th>Benefits</th>
<th>Constraints</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landmark 1: New CSRP Atrium</td>
<td>• Large atrium space memorable in itself</td>
<td>• Large space, may be confusing for some users</td>
<td>• User focal point req'd</td>
</tr>
<tr>
<td></td>
<td>• Allows area for incorporation of artwork</td>
<td></td>
<td>• Interactive wayfinding cueing</td>
</tr>
<tr>
<td></td>
<td>• Decision point area</td>
<td></td>
<td>• Meaningful elements</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• High illumination for key areas</td>
</tr>
<tr>
<td>Landmark 2: Existing Elevator</td>
<td>• Stone wall treatment contrasts with surrounding materials</td>
<td>• Neutral colour palette (floors, walls)</td>
<td>• Contrast w/ other areas</td>
</tr>
<tr>
<td>Area</td>
<td>• Opportunity for further visual interest</td>
<td>• Multiple signage</td>
<td>- Layer of meaning required</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Function as a destination point unclear</td>
<td>• High illumination</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ceiling non-defined ACT</td>
<td>• Adjacent spaces need further differentiation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Update of materials</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Use of form to accentuate location possibly ceiling &amp; floor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• High illumination to focus attention</td>
</tr>
</tbody>
</table>

5.5 Safety and Security (Canadian Building Code Analysis)

The following requirements must be met for healthcare environments in Canada. In particular, the next points have been chosen from the Canadian Building Code (National Research Council, 1995) for their relevance to wayfinding areas identified at the HSC site:

**Egress:**

- every egress doorway shall be served by aisles that have a clear width of 1100 mm (p. 20).
- at every point on an exiting path, two opposite directions by which exiting is possible must be available, with no dead-ends (p.20).
- exiting lighting, signs, and emergency lighting must be provided (p. 20)
- headroom clearance not less than 2100mm (p.113).
• travel distance from any point to exit shall not exceed 50 m (p.111).
• handrails required on both sides of a pathway if greater than 1100 m wide (rail itself to be between 30-50mm in diameter) (p.115).

Fire regulations:

• sprinkler system required throughout (p.47).
• access to fire department equipment (sprinkler or standpipe) must remain free of obstruction (p.19).
• travel distance between fire separations (doors) must be less than 45 m (p.106).

Fire Doors:

• must be self-closing upon alarm (p.47).
• must swing with path of travel towards direction of the exit (p.99).

Materials:

• floor assemblies shall be fire separations with a fire resistance rating of not less than 2 hrs (p.47).
• wires and cables must be enclosed in non-combustible materials/raceways (p.31).
• minor combustible components that are generally acceptable include: paint, wall paper (flame-spread rating less than 25), adhesives, electrical outlets, wood blocking within walls, millwork units, etc.
• interior finishes are generally allowed as long as they are less than 25mm thick, with a flame-spread rating of less than 150 (p.47).
• corridors specifically require a flame-spread rating of 75 or less, be not more than 9m wide, and if the walkway separates buildings, must have a fire resistance rating not less than 45 minutes (p.47).

Universal Accessibility:

• obstructions located within 1980 mm of the floor shall not project more than 100 mm horizontally into a pathway (below 680mm this is allowable) (p.99).
• doors must have a clear opening width of not less than 800 mm, be easily operable with one hand (p.99).
• areas of refuge must be provided in areas where it may be difficult to move some patients/other users (p.106).
• any ramp slope should not exceed 1 in 10 (p.116).
5.6 Lighting, Materials, & Colour

**Lighting:** Lighting considerations for the HSC site must be carefully considered. There are many types of lighting that may be employed, most basically:

The use of general overhead applications, which allow for easy perception of reading or manual tasks, random circulation and unguided attention, flexible use of space, and a sense of a public rather than private space (Bernecker, 1993).

According to Bernecker, the use of specific *patterns of light* assists in the formation of a specific characteristic of a room, by subtly highlighting information for the user. This type of lighting approach can shape the impression that a space has for a viewer, by indicating a type of mood such as privacy, or relaxation. It can also influence behavior in some instances, by directing a user from one space to the next (statistically individuals will choose to take the path with higher luminance). By directing user attention, lighting strategy can serve to highlight important areas and reinforce user understanding of a space.

From examples outlined in Bernecker’s (1993) “Psychological Aspects of Lighting”, the following chart outlines a proposed strategy for lighting of the specific wayfinding areas:

<table>
<thead>
<tr>
<th>TABLE 10: Lighting Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of Space</strong></td>
</tr>
<tr>
<td>Paths</td>
</tr>
<tr>
<td>Edges</td>
</tr>
<tr>
<td>Districts</td>
</tr>
<tr>
<td>Nodes</td>
</tr>
<tr>
<td>Landmarks</td>
</tr>
</tbody>
</table>
Although these lighting suggestions are general, they may provide an effective approach for wayfinding when combined with a variety of other spatial composition variables.

**Materials:** Material considerations need to be in accordance with HSC health care design standards.

The final design attempts to match existing materials, and incorporates the following considerations:

- Life cycle
- Cost (budget)
- Flame spread rating
- Durability (anti-microbial) - maintenance and hygiene
- 40 year approximate horizon for a healthcare environment

**Colour:** Colour selection is dependent on area. To meet the needs of a wayfinding strategy, colour must be used to highlight key locations, define differences between areas, and to provide visual variety that is memorable for the user. Careful integration of existing colour palettes must be incorporated into new wayfinding strategies for any interior.

### 5.7 Design Guidelines

<table>
<thead>
<tr>
<th>Issue</th>
<th>Objective</th>
<th>Design Concept</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial Requirements</td>
<td>Wayfinding Success</td>
<td>Integrated System based on foundation of elements defined by Lynch</td>
</tr>
<tr>
<td>Functional Requirements</td>
<td>Provide Memorable Elements</td>
<td>Use of variety of landmarks to create highly image friendly / memorable environments</td>
</tr>
<tr>
<td>Adjacencies</td>
<td>Link key Wayfinding elements in a meaningful way</td>
<td>Coherent systems</td>
</tr>
<tr>
<td>Safety and Security</td>
<td>Ensure user health and well being</td>
<td>N/A</td>
</tr>
<tr>
<td>Lighting</td>
<td>Compliment / act as wayfinding element(s)</td>
<td>Application dependent on area</td>
</tr>
<tr>
<td>Materials</td>
<td>Balance cost and effectiveness</td>
<td>Complement formation of distinct areas</td>
</tr>
<tr>
<td>Colour</td>
<td>Compliment / act as wayfinding element(s)</td>
<td>Complement formation of distinct areas</td>
</tr>
</tbody>
</table>
6.0 Design

See Appendix E for detailed drawings.

Overall Design Strategy:

- The design exploration encompasses key orienting areas of the building, as well as pertinent paths that lead to the new structure.
- The design framework is derived primarily from the proposed recommendations, which were created from Lynch’s (1960) principles and other key theories, as well as information from the design programme.
- Design strategy objective: a) to make optimal use of wayfinding cues, thereby assisting the navigation of interior space; and b) to facilitate knowledge of route connections between locations and knowledge of overall spatial configuration.
- The design process extends the existing wayfinding, with a new organization and consistent system.
- Recognizable elements create a pattern which will help users to wayfind independently, while reducing instances of repetition.
- Areas are articulated according to path, edge, district, node, and landmark guidelines (to design with the way that people create mental imagery).

Conceptual development:

The following are concepts incorporated into the final design:

- ART in as many places as possible...to create memorable environmental imagery.
- Imagery that appeals to a wide variety of groups.
- “Areas of rest” become the areas of orientation.
- 3D art: transparent/lit site map using axonometric style (to provide a universal approach to interior signage)
- “Landmarking” of particular areas...providing the level of complexity that is required. (Good for literacy-impaired people).
- “Information landmarks” combining strategies that capitalize on a) sequential mapping and b) coordinate mapping where users:
  a) follow signage, and
  b) find their way based on architectural information (Arthur & Passini, 1990, p.11).

These areas are attractive...info booth style with eye-catching display that people may want to inspect.

- Low-tech (affordable) approach adopted. Information landmark areas could be wired for a high-tech approach, should future requirements and resources make this feasible. These elements would be strategically placed for the incorporation of new technologies.
6.1 Design of Path Areas (Plans & Perspectives)

Strategy for Paths:

1. Increase visual access to surrounding areas where possible
2. Capitalize on connections (to adjacent areas) to increase identity awareness
3. Use unifying characteristics where possible, space type, materials, colour, texture, pattern, lighting, etc.

PATH DRAWINGS (see Figures 34-36):

FIGURE 34: Path 1 Key Plan
FIGURE 35: Path 1 Plan
FIGURE 36: Path 1 Perspective

PATH 2 DRAWINGS (see Figures 37-39):

FIGURE 37: Path 2 Key Plan
6.2 Design of Edge Areas (Plans & Perspectives)

Strategy for Edges:

1. Create clear boundaries between areas, consider multiple methods by which this may be achieved
2. Consider the detail where two edges intersect; high contrast at this point may be particularly effective
**EDGE 1 DRAWINGS** (see Figures 40-44):

**FIGURE 40**: Edge 1 Key Plan

**FIGURE 41**: Edge 1 Plan

**FIGURE 42**: Edge 1 Perspective A
FIGURE 43: Edge 1 Perspective B

FIGURE 44: Edge 1 West Elevation
EDGE 2 DRAWINGS (see Figures 45-47):

FIGURE 45: Edge 2 Key Plan

FIGURE 46: Edge 2 Plan

FIGURE 47: Edge 2 Perspective
6.3 Design of District Areas (Plans & Perspectives)

Strategy for Districts:

1. Reinforce sense of arrival, confirming for user that destination point has been reached
2. Create a consistent characteristic that defines the area clearly, possibly in accordance with the use of space
3. If further definition is required, identify the area with a cohesive use of space type, materials, colour, texture, pattern, lighting, etc.

**DISTRICT DRAWINGS** (see Figures 48-51):

![District Key Plan](image1)

**FIGURE 48**: District Key Plan

![District Plan](image2)

**FIGURE 49**: District Plan
FIGURE 50: District Entry Perspective A

FIGURE 51: District Desk Perspective B
6.4 Design of Node Areas (Plans & Perspectives)

Strategy for Nodes:

1. Allow for display of important wayfinding elements within this area
2. Integrate or provide space for landmarks
3. Allow for areas of rest or orientation
4. Express the space type, materials, colours, textures, patterns, and lighting that are used in the surrounding areas

NODE 1 DRAWINGS (see Figures 52-54):

FIGURE 52: Node 1 Key Plan

FIGURE 53: Node 1 Plan
NODE 2 DRAWINGS (see Figures 55-57):

FIGURE 54: Node 1 Perspective

FIGURE 55: Node 2 Key Plan
FIGURE 56: Node 2 Plan

FIGURE 57: Node 2 Perspective
6.5 Design of Landmark Areas (Plans & Perspectives)

Strategy for Landmarks:

1. Contrast with surroundings
2. Locate near to strategic (decision point) areas
3. Make interactive for users, to increase level of engagement
4. Create a pattern, or consistency, to help form route identification  
   (relates to the information landmark approach)
5. Provide landmarks that users can engage with (relates to the information landmark approach)
6. Layer of detailing to incorporate meaningful elements (tradition, style, landscape) for "placemaking"
7. Use of art as memory devices, allowing for meaningful engagement with the environment  
   (Canadian theme...natural geography)

LANDMARK 1 DRAWINGS (see Figures 58-60):

FIGURE 58: Landmark 1 Key Plan
FIGURE 59: Landmark 1 Plan

FIGURE 60: Landmark 1 Perspective
LANDMARK 2 DRAWINGS (see Figures 61-63):

**Figure 61**: Landmark 2 Key Plan

**Figure 62**: Landmark 2 Plan
Strategy for Information Landmarks:

1. Conspicuous theme is easily identifiable through a set of conspicuous cues. Strive for a consistency that is recognizable for a variety of user groups.

2. Carefully organized wayfinding indicators providing the tools for wayfinding: regular, highlighted important orientation areas.

3. Designated area to locate eye-level signage, which allows for streamlining of the visual environment. Employ diverse (simple), visually appealing, colour-coded cues.

4. Spatial approach used to clearly differentiate the information landmarks from the areas around them. This creates a visual difference between areas.

5. Consistent expression of form & colour could provide an easily recognizable anchor point, located at prominent intersections and destination points.

6. Use of higher illumination and materials in combination with lighting that reduces glare is advisable.

7. Maps provided in a variety of dialects, including Braille. Basic information, provided in a variety of ways. (Redundancy of cueing)

8. Located at decision points, although each info landmark is defined by the context of the spaces around it (specific design dependent on surroundings).

9. Provides an area that focuses user attention, and informs the user about how to understand the environment upon entry.
10. Creation of a path through the linking of individual information landmarks
11. Flexible in that it allows for changes in hospital signage needs

Strategy for Axonometric Site Plans:

1. Help users to understand the layout of the entire environment, to aid their understanding of their location in relation to the environment. (Route connections & overall spatial organization)
2. Well suited for addressing the needs of different cultures (universal approach).

6.6 Materials, Form, Lighting, & Furniture

For the purposes of the wayfinding design as a whole, the elements chosen were selected for a variety of reasons. Each approach for the separate design areas will be explained here. For Path 1, a cool colour palette was chosen, in part to complement the water tones of the CSRP building, but also to create a calming entry point for the emergency area of the hospital. Additionally, the use of blue tones served to highlight the first information landmark encountered for users entering from the William Avenue Parkade. This contrast was particularly important to introduce users to the wayfinding system immediately, creating a space that is very
difficult to miss. Flooring materials were patterned to reinforce the function of the space (creating a directional cue), with spotlight flooring to indicate the point of pause, or decision-making area that the information landmark provided. Lighting in this pathway was kept as unobtrusive as possible, to prevent distraction from the focal point area, the information landmark.

The Path 2 area was treated with a slightly warmer colour palette, as the functions of the surrounding areas are less clinical in nature. Since the space links support services (eating, shopping, and waiting areas), the intent was to create a sense of warmth that would encourage users to linger. Flooring materials are patterned to illustrate directional nature of the space, a bulkhead is dropped and differentiated with colour to further indicate path, and the seating is complementary in colour and comfort. All seating chosen for this project was from Softcare, a Canadian company specializing in public and healthcare seating. Again, the information landmark area in this space is vibrant in colour and lighting, and clearly indicates its use - as a method by which individuals can orient themselves independently.

Edge 1 area has only slight adjustments made to enhance the visual clarity of the space. Contrasting flooring is used to demarcate the path and areas from one another, and a colourful, highlighted information landmark is placed at the end of the hall to indicate the information and rest area that is available. To further enhance the existing exterior façade of the General Hospital building, perimeter lighting is used to create a dynamic vertical plane.

Edge 2 is similarly detailed, the floor clearly separates one area from another, an information landmark is visually available at the next point of decision, and the identities of the two spaces are clearly marked; CSRP with an urban mural, General Hospital with an exterior façade.

The District area, which includes patient waiting areas for multiple day-patient clinics of the General Hospital, has a particular look and feel created for it. It is differentiated from the areas around it with a cool linear palette and patterning. The flooring material and directional mural separates it from the surrounding spaces, and carefully defined (formed and lit) nurse's station bulkheads announce the destination points to the users. Recessed lighting is used to highlight the entry point and provide a variation from the surrounding fluorescents.

For Node 1, a warmth was intended to be conveyed by the materials. With a pattern that clearly marks it as an important decision and information area, the material strategy serves to highlight and focus user attention.
Lighting is also employed in this regard, with recessed fixtures circularly arranged to denote a rest and relaxation area. An artwork mural is incorporated onto the far wall, and a variety of seating is included to create a dynamic space.

Node 2 is a smaller area, along a major corridor within the hospital. This area was kept intentionally neutral, to highlight the difference of the areas directly adjacent. Lighting is general, with focused recessed fixtures located in the information landmark area.

The area of Landmark 1 is the atrium waiting area of the CSRP building. Materials were chosen to complement the existing colour strategy, and to create a calm and cool environment which, again, contrasts with the information landmark located within the space. Seating is Softcare once again, and lighting is arranged so as to be directional, providing an additional layer of cueing for the user.

The smaller area of Landmark 2 is an elevator area within the General Hospital. To clearly define and draw attention to this area, the flooring material is patterned to mirror the bulkhead above, creating an "x marks the spot" detail. Vibrancy of colour is important in this area, and contrast and higher illumination are used to create this effect.

For the information landmarks in general, a consistent material and lighting strategy was employed. Orange in colour, these areas were created of millwork pieces with durable laminate finishes to draw attention while enabling them to undertake a high degree of wear. For additional protection, stainless steel edging was employed as a useful element that was easily incorporated into the motif to further enhance the importance of these areas. More information regarding material choices and rationale are located in the Finish Schedule for this project, Appendix D.

All together, this practicum does not propose that one particular material, form, lighting, and furniture approach is mandatory for successful wayfinding. Rather, it illustrates the necessity for each space to be carefully articulated according to use, as well as employing a consistent theme for areas that are dedicated to the use of wayfinding direction.

7.0 Results

The preceding inquiry and analysis provides a basis upon which to evaluate the programme objectives and practicum goals. This practicum determined issues relevant to wayfinding, analyzed the requirements of the HSC site, and created an integrated design strategy that theoretically serves to increase navigational success.
Questions were outlined at the start of this exploration, and some have been answered more successfully than others. The following is a brief synopsis of these questions and the subsequent results.

• What is it that impedes/obscures the wayfinding strategies of designers?

There are a variety of factors that inhibit the success of wayfinding strategies, which are outlined within this document, involving physical, emotional, and environmental elements. It is quite clear that there is no one particular factor that impinges upon the success of a wayfinding strategy, but instead, many variables can collectively contribute to user disorientation within an environment.

• How does this study differ from/extend current wayfinding practices?

This practicum effectively distills wayfinding theory from a variety of disciplines such as Urban Planning, Cognitive Psychology, and Architecture to create a viable strategy that is useful for Interior Design.

• What is the value of this study?

Again, although wayfinding research is extensive, this practicum provides a valuable method for approaching wayfinding challenges for Interior Designers. Specifically, it provides specific examples of how a large set of buildings may be successfully designed to work as a system for wayfinding from the first moment of entry into the facility.

• What are the practical applications of cohesive wayfinding theory?

The strategy of wayfinding implementation outlined here can potentially be adapted to a variety of public spaces. For the greatest measure of success, this solution suggests segmenting a larger area into its component parts, designing to create a memorable identity for each, and providing additional support spaces (information landmarks) that provide navigational support through multiple methods. The key aspect of this approach is that it is context-specific, in that this system could be applied to other interior environments, as long as the related building and user requirements were carefully designed for.

• What are the problems with wayfinding and wayfinding literature?

There is a wealth of wayfinding literature available, written from the perspective of many disciplines. There is even literature aimed at categorizing specific elements that must be considered when designing for an interior environment. However, instances of holistic strategies (that work as a system integrated with the built environment) were difficult to find, particularly in relation to Interior Design.
This study approaches potential wayfinding research in ways that can be easily applied to any public facility, but that are specifically detailed for a Canadian healthcare environment. The literature review yielded data that was essential to the formation of the design strategy. In particular, the work of Lynch (1960) was used as a basis for breaking down the greater environment into manageable sections that were easier to understand and design for. The formulation of areas according to the principles of path, edge, district, node, and landmark served as a template for wayfinding design that could be easily applied to other public spaces. In addition, data regarding cognitive mapping, memory, placemaking and existing precedents helped to inform the structuring of a strategy that employed a set of conspicuous wayfinding spaces, which are called information landmarks.

The site analysis and programming sections assisted the design process by providing a solid foundation of the physical and social requirements of the project. Synthesized together, each of these investigations informed the final design in a variety of important ways.

For future design inquiry, it may be useful for interior designers to employ primary research as a method for data collection. This could allow for a more comprehensive (and perhaps accurate) analysis of how an environment operates in terms of wayfinding. The investigation process of this practicum has revealed that, ideally, it would be beneficial for wayfinding and signage experts to be consulted for projects during the early stages of the design process (Jeffrey, 2003). Limitations to this suggestion involve the reality that the design process often requires frequent rearrangement of the final areas during the design and build phases. In this situation, it may be imperative for signage/wayfinding consultants to assist at a later date. Budget, time, and legal issues may also require the process to occur in this manner (Sellors, Personal communication, January 2004).

Regardless of the specific direction taken with respect to future inquiry into the application of interior wayfinding to Interior Design, it remains imperative that wayfinding principles continue to inform our most vital public spaces. This practicum has sought to provide a coherent and integrated method by which this can be accomplished. This inquiry has therefore proved successful in both answering the primary design questions and achieving the objectives set forth at the outset.
References


Finkel, G. (October 2002). [Email correspondence] Interview regarding spatial hierarchy, universal design, and wayfinding strategy.


Health Sciences Centre. (September 1993). Signage system document. Winnipeg, Manitoba, Canada: Author.


Leskiw and Associates. (2001). Review of Aboriginal Services at Health Sciences Centre and St. Boniface General Hospital. Winnipeg, Manitoba, Canada: Winnipeg Regional Health Authority.


Appendix A: HSC Centre Drawing and Photograph Consent Forms
Smith Carter Drawing Consent Form

Allison Fulford

Winnipeg, Manitoba

Attn: James Weselake
Smith Carter Architects and Engineers
1601 Buffalo Place
Winnipeg, Manitoba
January 15, 2004

Dear Mr. Weselake,

My name is Allison Fulford, and I am currently a student in the Master of Interior Design program at the University of Manitoba. I am working on a practicum that is focused on integrated wayfinding strategies for interior healthcare environments. Currently, I am attempting to select a site upon which I could base my study. My interim advisor, Mr. Jason Kasper, recommended that I contact you in regard to your recent work on the Health Sciences Centre Critical Services Redevelopment Project (CSRP). He indicated to me that you may be willing to allow me to use Smith Carter's digital or hard-copy drawings of the building for my practicum.

I have also been in contact with Laura Shea of the Health Sciences Centre Physical Planning Department. She has indicated to me that the Health Sciences Centre CSRP would be an excellent site for a research-based wayfinding study. For your information, I have included a brief synopsis of the practicum.

Purpose of the study:

To analyze current applications of wayfinding strategies, and through research, develop a design solution that is applicable to an existing or future site. The final design document and design scenario could serve to provide an example of integrated wayfinding strategies applicable to many healthcare scenarios.

If Smith Carter agrees to provide documents (digital or otherwise) from the CSRP project, the drawings would be used for my practicum only and will not be shared with any other student or individual. Individuals that would have direct access to the documents (and only for educational purposes) would be myself, and the members of my practicum committee who include: Mr. Jason Kasper, Professor Cynthia Karpan, and Dr. David Gregory, Dean of the Faculty of Nursing at the University of Manitoba.

As well, since the final jury of the practicum defense is open to the general public; other individuals may view drawings provided by Smith Carter. Also, the final practicum written document will be published and available in the University of Manitoba's Library circulation.

If Smith Carter agrees to provide any documentation for the purposes of this student practicum, all proper acknowledgement will of course be given in the practicum document and on any drawings, and an executive summary will be provided at the conclusion of the project.

I would be extremely appreciative of any assistance that your organization could provide in regards to this educational
As well, since the final jury of the practicum defense is open to the general public; other individuals may view drawings provided by the Health Sciences Centre. Also, the final practicum written document will be published and available in the University of Manitoba's Library circulation.

I would be extremely appreciative of any assistance that the Health Sciences Centre can provide in regard to this educational endeavor. If this proposal is acceptable to the Health Sciences Centre, please indicate your approval by signing one of the consent forms and returning it to me in the envelope provided. The other consent form is for your records. If you have any further questions about this study and wish to discuss the Health Sciences Centre's involvement, please feel free to contact me via phone or email.

Best regards,

Allison Fulford

Date

Jason Kasper
Interim Advisor

Date
Consent Form: (Drawings)

This form provides consent for Allison Fulford to use drawings related to the Health Sciences Centre Critical Services Redevelopment Project in Winnipeg, Manitoba.

All documents will be used for educational purposes only.

All information provided will be appropriately cited and acknowledged.

________________________________________
Name
Health Sciences Centre

________________________________________
Signature

________________________________________
Date
Consent Form: (Photo Documentation)

This form provides consent for Allison Fulford to photograph physical elements of the Critical Services Redevelopment Project at the Health Sciences Centre in Winnipeg, Manitoba.

All documents will be used for educational purposes only.

All information provided will be appropriately cited and acknowledged.

Allison Fulford

Date

Jason Kasper
Interim Advisor

Date

Name (Health Sciences Centre)

Signature

Date
Appendix B: Smith Carter Drawing Consent Form
HSC Centre Drawing and Photograph Consent Forms

Allison Fulford B.E.D.

Winnipeg, Manitoba

Laura Shea
Physical Planning Department
Health Sciences Centre
3rd Floor, 720 McDermot Avenue
Winnipeg, Manitoba

January 15, 2004

Dear Laura,

I want to thank you for all of the valuable guidance you have provided in regard to my practicum. My research into wayfinding and its many applications has been greatly expanded due to your input. Since our discussions, it has been confirmed that I am required to obtain formal consent for the use of the information and drawings you have provided to me thus far. I am currently attempting to receive permission from Smith Carter Architects and Engineers for the use of their drawings, and would like to ask the same from the Health Sciences Centre. As the new Critical Services Redevelopment Project (CSRP) site provides an excellent opportunity for my practicum, I hope that permission will be granted from the Health Sciences Centre for the following:

- Use of existing site drawings, which will provide the basis for the practicum programming analysis, and wayfinding design. All information provided by the Health Sciences Centre will be given the proper acknowledgement.

- Photo documentation of the site, surrounding buildings, and adjacent interiors that will be affected by the proposed practicum design solution. Any photographs taken will document the physical environment only, and will purposefully exclude any human subjects to maintain patient, visitor, and employee confidentiality.

Authorization of the use of these documents would allow me to critically analyze an existing and future healthcare interior, and hopefully aid in the development of new integrated strategies for wayfinding. For the photo documentation segment of the analysis, I am requesting that you suggest times that might be viable for minimum pedestrian traffic flow, and that will minimize any potential disruption. I will also require clarification as to security issues that must be addressed in order to complete this task.

If the Health Sciences Centre agrees to provide documents from the CSRP project, all information obtained would be used for student research only. Individuals that would have direct access to the documents for educational purposes would be myself and the members of my practicum committee who include: Mr. Jason Kasper, Professor Cynthia Karpan, and Dr. David Gregory, Dean of the Faculty of Nursing at the University of Manitoba.
endeavor. If this proposal is acceptable to Smith Carter, please indicate your approval by signing one of the consent forms and returning it to me in the envelope provided. The other consent form is for your records. Of course, I am more than willing to pay for any costs involved in either printing the drawings or duplicating digital files. If you have any further questions about this study and wish to discuss Smith Carter's involvement, please feel free to contact me via phone or email.

Best regards,

Allison Fulford

Jason Kasper
Interim Advisor

Date
Consent Form:

This form provides consent for Allison Fulford to use drawings related to the Health Sciences Centre Critical Services Redevelopment Project in Winnipeg, Manitoba.

All documents will be used for educational purposes only.

All information provided will be appropriately cited and acknowledged.

________________________________________
Name (Smith Carter)

________________________________________
Signature

________________________________________
Date
Appendix C: Standard Image Consent Form
I, Allison Fulford, a graduate student at the University of Manitoba, request permission to quote/reproduce the following material listed below in preparation of my thesis/practicum for the degree of Master of Interior Design. My practicum will be microfilmed by Library and Archives Canada and copies of the film will be reproduced, lent or sold through University Microfilms International (UMI). I would be very grateful for your favorable consideration of this request. Thank you for your assistance.

Authorization is granted to the above named graduate student, the University of Manitoba and Library and Archives Canada to reproduce:

Title of article/book: 

Image, pg. number: 

Publisher, year: 

Journal name, issue number, year: 

The above noted material(s) is/are authorized for inclusion in the thesis/practicum titled:

"Wayfinding: Creating Integrated Strategies for an Interior Healthcare Setting"

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______________________________ City/Province/State/Postal Code

______________________________ Telephone

______________________________ Fax

Date: ___________________________

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Appendix D: Finish Schedule Document
## Finish Schedule & Benefits of:

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|      | Fl-red      | Tarkett Optim  | 42 808   | healthcare seating, ease of maintenance (typ) |
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|      | Red wall    | Pratt&Lambert | 1870 Scarlet O'Hara | healthcare seating, ease of maintenance (typ) |
|      | Red columns | Pratt&Lambert | 1013 Vintage Claret | healthcare seating, ease of maintenance (typ) |
|      | Light Blue  | Pratt&Lambert | 1323 Bouda | healthcare seating, ease of maintenance (typ) |
|      | Brn columns | Pratt&Lambert | 2267 Gloves Duvet | healthcare seating, ease of maintenance (typ) |
|      | Blue wall   | Pratt&Lambert | 2323 Steel | healthcare seating, ease of maintenance (typ) |
|      | Blue Base   | Pratt&Lambert | 2324 Confederate | healthcare seating, ease of maintenance (typ) |
|      | Green BH    | Pratt&Lambert | 2325 Zinc | healthcare seating, ease of maintenance (typ) |
|      | Pale wall   | Pratt&Lambert | 2277 Muffin Tan | healthcare seating, ease of maintenance (typ) |
| Wall Base | Amico | #113 | healthcare seating, ease of maintenance (typ) |
| Seating | Softcare | Ganged seating | healthcare seating, ease of maintenance (typ) |

| E2   | Fl-light    | Tarkett Optim  | 42 862   | healthcare seating, ease of maintenance (typ) |
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|      | Blue wall   | Pratt&Lambert | 2323 Steel | healthcare seating, ease of maintenance (typ) |
|      | Bl wall base | Amico | #199 | healthcare seating, ease of maintenance (typ) |
| Wall mural | Stainless Steel | Formica | 2171 Double Brushed Aluminum (similar finish) | 1) 34mm gripping diameter, extends 76mm from wall 2) Mounted on a sturdy 2mm thick, cont. aluminum retainer 3) 2mm thick, scratch and stain resistant rigid vinyl cover (typ) |
| Seating | Softcare | Ganged seating | healthcare seating, ease of maintenance (typ) |
## Finish Schedule & Benefits of (continued):

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Appendix E:
Final Design Drawing Package (Plans, Elevations, Sections, Details)
DESIGN AREAS: PATH/EDGE/DISTRICT/NODE/LANDMARK

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<th>AREA</th>
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PLAN: NODE 1
SCALE: 1/8"=1'-0"
REFLECTED CEILING PLAN: NODE 1
SCALE: 1/8"=1'-0"
NOTES:
1. CONTRAST OF FACADE ELEVATOR FRAMES & WALL PANELS TO HIGHLIGHT ARCHITECTURAL ELEMENTS*
2. CROSS BULKHEAD FORMATION WITH MIRRORED FLOORING PATTERN TO MARK CHOICE OF CIRCULATION (VERTICAL)*
3. EXISTING BRONZE WALL ART TO REMAIN*

* SERVES AS AN IMAGE LANDMARK
2x10 FRAMING 16"O.C. (CUT TO SIZE)

1/8" DRYWALL

11/16" MDF (TYP)

1/8" Plexiglass

Fluorescent fixture mounted to framing

Handrail

2x4 Framing (Typ)

Bracing (Typ)

Plan: Millwork Unit #3
Scale: 1/4"=1'-0"

Section: Millwork Unit #3
Scale: 1"=1'-0"