Environmental information design; the traveler's wayfinding experience

Lyndsay Beauchamp

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Environmental Information Design
The Traveler’s Wayfinding Experience

Rochester Institute of Technology
College of Imaging Arts and Sciences
School of Design
Graduate Graphic Design MFA Program

This thesis submitted to the faculty of the
College of Imaging Arts and Sciences
in candidacy for the degree of Master of Fine Arts

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May 2003
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Acknowledgements

I want to sincerely thank those who have offered their encouragement and guidance throughout this project:

    Professor Deborah Beardslee
    Professor Roger Remington
    Professor Bruce Ian Meader

Love to Mom, Dad and Greg for encouraging me to pursue my dreams and supporting me along the way.

Wes, you are my stronghold. Thank you for your infinite patience. I love you.

A special thanks to my dear friends Asha and Camille.

Finally, I wish to thank all my classmates who endured the same long hours and late nights. I am so proud of all of you.
“I define the term 'environmental design' as an art larger than architecture, more comprehensive than planning, more sensitive than engineering. An art pragmatic, one that preempts traditional concerns. The practice of this art is intimately connected with one man's ability to function, to bring visual order to his surroundings, to enhance and embellish the territory he occupies.”

Richard P. Dober
Environmental Designer
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Thesis Project Definition

Introduction

This thesis project has been directly inspired and influenced by attendance at the 2002 Summer Academy sponsored by the International Institute of Information Design (IIID) in Vienna, Austria. The author was exposed to many aspects of information design during the scope of the program, "Traveling the City." The program involved an evaluation of Vienna’s transportation system and related information design throughout the area. Participants evaluated the existing elements of Vienna’s various traveled environments, concentrating on four areas: content, wayfinding, transport and digital influences. Daily experience traveling through multiple wayfinding systems, negotiating unfamiliar signage in a foreign language and becoming lost prompted many of the ideas presented in this thesis study.

Thesis Project Goals

Everyone has known the feeling of being lost, disoriented or out of place at some point during their travels. The experience of a city is different for every person. When navigating a city, it is important that certain kinds of information be readily available and easily accessible. Transit systems, such as bus routes and subways, need to be comfortable to commuters native to the city and to new tourists, as well. Information design in the traveled environment plays an important role in aiding the traveler, without being overbearing. It becomes part of the environment, and is an expected addition to the city that is both familiar and helpful.

This thesis is a demonstration project about environmental information design and wayfinding, focusing specifically on Toronto, Canada’s subway system. Attention has been given to both street-level and below-ground environments. The transition from above to below ground and the identification of subway stations will also be addressed. Implementation of systems thinking as it relates to the use of typography, color and symbols will result in a design solution that focuses on improving Toronto’s existing system, and the overall wayfinding experience in this city.

This thesis project aims to develop an approach towards wayfinding design that improves upon existing systems. In doing so, this project is able to contribute new and useful solutions to the discipline of environmental information design.
Precedents

The labyrinth is both the actuality and symbolic nature of disorientation. Today, many maps and navigational systems recall this idea of the labyrinth, causing information designers to address this inexhaustible problem. The relationship between user and environment has been explored throughout history. This relationship significantly influenced this thesis project’s evaluation of wayfinding systems.

Henry Beck’s London Underground map, initially developed in 1933 and refined over thirty years, paved the way for the representation of direction, space and time in map design. His ingenuity set universal standards of transportation design for many international cities from that point forward.

Massimo Vignelli’s Unigrid system for the National Parks Service brought unity and clarity to many kinds of information. Later, his design of the New York subway system and design standards manual was based on the idea of simplification of elements, much like Henry Beck’s design. This thesis project employs these principles.

In the 1970s, the Society of Environmental Graphic Designers (SEGD) was formed in Massachusetts. This group has been instrumental in elevating design standards among graphic designers and architects. Educational improvement in the area of environmental communication is also a priority for SEGD.

Richard Saul Wurman has published a number of texts on information design and its effectiveness. Information Anxiety: What To Do When Information Doesn’t Tell You What You Need discusses making design more accessible and meaningful. Wurman’s Man-Made Philadelphia is a guide to Philadelphia’s physical and cultural environment through simplified representation of the city, making the city more accessible and inviting. Map designs and information designed for the tourist, found in Wurman’s Access Guide for Paris and Tokyo, have influenced this thesis project.

Paul Arthur and Romedi Passini’s book, Wayfinding: People, Signs, and Architecture, offers a comprehensive look at wayfinding as a process, and how designers handle different issues concerning the topic of navigation in the physical environment. It has been an important resource for understanding wayfinding behavior and environmental information design.
Research and Analysis

Research for this thesis project included the topics of environmental information design, wayfinding and human behavior, spatial orientation and reasoning in the built environment, as well as an external audit of existing wayfinding system design solutions.

Cognitive Mapping and Spatial Orientation

Wayfinding represents a person’s relationship to space. Wayfinding, or spatial problem solving, is comprised of decision making, decision executing and information processing. Travelers translate a physical setting into a layout or shape to which they can relate. The result is a cognitive map, which is an overall mental image or representation of space. Travelers then formulate a plan of action to link their current location to their destination. If information is inaccessible or a physical environment is confusing, a traveler is unable to form a cognitive map. Disorientation, confusion and stress often result.

Travelers assess their physical environment and make a mental map of the area based on:
- previous experiences
- environmental context
- spatial characteristics of the physical setting
- information on signs, maps and indicators
- time factors, interest and security along a route
Research and Analysis

Accessible Wayfinding:
Pragmatic / Functional Considerations

Throughout this project, it was important to understand existing difficulties of wayfinding in order to arrive at more effective solutions. Inherently, cities are often difficult to navigate. Therefore, it is the information designer’s responsibility to develop tools that can make cities more accessible. Accessibility in this case refers to both physical and informational solutions. Of course, wheelchair ramps and well-lit hallways improve access to a physical setting. But accessibility of information, directions and signage are equally important. Architectural and informational barriers result in psychological barriers, as well.

Wayfinding design has an impact on the user’s emotional state, including feelings of fear and safety. It has a functional impact and involves accessibility and public safety. Frustration and stress are common when navigating an unfamiliar environment, especially when a traveler becomes disoriented and lost. Signage can be informative and helpful if implemented correctly. Travelers can become confused by signage that is too small, unclear, poorly located or unreliable.
Research and Analysis

Semantic / Communication Considerations

Color, size and location are important elements to consider when designing a wayfinding system. For instance, typography on signage appears larger when reversed out of a black background. Typographic variables, such as typeface and size, are important in providing a clear, visible message. Color coding is a common solution for subway line identification. Red, yellow and blue are the most discernible and recognizable choices for color coding in these instances. Shades of black, white, grey and brown are also common. Certain shades of teal are not effective because they can be seen as either blue or green.

Syntactic / Formal Considerations

Language, readability and legibility affect information processing. It is important to remember that legibility and readability are not interchangeable terms. Readability is the ease of viewing information. It is not an issue of comprehension. Legibility is recognizing words and content. When design is legible, comprehension and understanding result.

Content and tone are also important to consider in information design. A clearly worded, concise message is crucial to wayfinding. Content should anticipate and meet the needs of the user. It must be well structured and logically organized. It has to be accurate, timely and provide information at the level of detail the user requires.
Research and Analysis

Audit of Existing Environmental Solutions

An audit of existing subway systems in selected major cities helped identify common or repeated design solutions in the environment. This type of research extended the thesis project beyond predictable or generic solutions, while incorporating elements that are proven to be universally successful.

Baltimore, Maryland
A map of the surrounding area is often incorporated into signage. The vertical free-standing format is a solution found in many cities.

Vienna, Austria
Signage posted on utility poles is a common generic solution. Often, there can be an overabundance of signage posted this way, creating unnecessary clutter.
**Research and Analysis**

**Munich, Germany**
Pictograms, rather than written language, are helpful to a user who is foreign or does not speak the native language.

![Image of a subway station in Munich, Germany](image)

**Boston, Massachusetts**
Color coding is found in subway stations and on subway maps around the world. This helps travelers make associations within a wayfinding system.

![Image of a subway station in Boston, Massachusetts](image)
London, England
Posters, mosaics or murals are a common solution in many subway stations, providing travelers with a sense of place for each location.

Atlanta, Georgia
Art installations are also used in many subway stations to ease the transition from above to below ground. Art can be one way of giving individual subway stations an identity. As mentioned above, a sense of place is created within a station. Travelers make visual associations and can more easily recognize a particular station.
Research and Analysis

Evaluating Toronto’s Existing System

The existing wayfinding system for Toronto’s subway was evaluated as part of the research for this thesis project. Challenges in this system have been described within the next three pages. In the Implementation section, “before and after” images have been provided to show the positive contributions these final design applications could make in their specific environments.

Directional street signage is attached to street poles in various formats and sizes. In this image, a rare sign directing travelers to a subway station is attached above a sign directing travelers to a museum.

Subway station identification can be overlooked in a busy urban environment. The Toronto Transit Commission (TTC) implements signage at street level which differs visually from signage found in subway stations. Signs at street level are not always distinguishable from surrounding street and vendor signs. Because station entrances are not always clearly marked, it is easy to miss a station entrance.

The transition from above to below ground is not always clearly marked or well lit. In this case, the transition can cause feelings of reservation and fear for safety in the descent into the underground environment.
Maps of the surrounding area are small and discrete. They are not part of a larger system, and are inconsistent with other maps provided by the TTC. The small type and competing colors make this map unfriendly for the user.

The red and yellow bands of color at the top of existing signage within subway stations do not always indicate subway lines. The red band, for instance, indicates the specific transit system a traveler is entering. A traveler unfamiliar with the system may become confused as to the purpose of the bands of color.

Lack of directional signage is a recurring problem within subway stations. It represents an absence of clear information design and can be confusing, vague or misleading.
Research and Analysis

Directional signage to street cars and buses does not conform with other signage systems within subway stations. It is a different format, orientation and size than subway line signage and subway maps.

Subway line signage does not indicate which specific platform the traveler is approaching. Though the direction is included, the traveler has no concept of stations (between Wellesley and Finch, in this case).

Murals and posters on the walls are used in many Toronto subway stations. As the train approaches, however, travelers have no way of discerning which station they are entering. In this case, there is no station name. Though this station appears inviting and interesting, a first-time traveler in this city might feel apprehensive or nervous about which station is approaching.
Research and Analysis

Interpretive Matrices

Interpretive matrices were developed to organize information gathered in the research phase of this project. An interpretive matrix cross-references characteristics or attributes of a subject. By making these comparisons, potential new directions are generated and a richer base for final selections results. The matrix below aims to organize and evaluate existing wayfinding systems in selected cities. Specific criteria were identified in each city, such as pedestrian considerations, transportation considerations, target audience and city wayfinding standards. A segment of this matrix is depicted below. A larger, more complete matrix can be found in Appendix A.

A Comparative Matrix of U.S. and International City Wayfinding Systems

<table>
<thead>
<tr>
<th>Pedestrian Considerations</th>
<th>Intuitive Aspects</th>
<th>Combined Efforts with other City Organizations</th>
<th>Target Audience: Native</th>
<th>Target Audience: Tourist</th>
<th>Symbol / Icon System</th>
<th>Focus on Specific Important Area of City</th>
<th>Sequential Aspects</th>
<th>Enhanced Public Image</th>
<th>Transportation Considerations</th>
<th>Complete Transportation System Included</th>
<th>Historic Considerations</th>
<th>Color Coding</th>
<th>Improved Access / Clarification</th>
<th>Provide City Standards</th>
<th>Language / Cultural Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Los Angeles, CA</td>
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<td>Indianapolis, IN</td>
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<td>Dusseldorf, Germany</td>
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<td>Dresden, Germany</td>
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</tbody>
</table>
Research and Analysis

A second interpretive matrix was developed to evaluate existing transportation maps in selected cities. Specific criteria were identified in each city, such as systems approach, accessibility, inclusion of districts and tourist attractions. Criteria for the matrices were selected based on information from an overview of gathered material. In this case, many maps were gathered and studied. Similarities and differences between the content of these maps offered meaningful categories. Criteria selection also focused on the most important needs of a traveler when using a map. A segment of this matrix is depicted below. A larger, more complete matrix can be found in Appendix B.

<table>
<thead>
<tr>
<th>A Comparative Matrix of U.S. and International City Transportation Maps</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Systems Approach</strong>&lt;br&gt;(Unified Look &amp; Feel)</td>
</tr>
<tr>
<td><strong>Multiple Systems on One Map</strong></td>
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<tr>
<td><strong>Easily Understood Color Coding</strong></td>
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<tr>
<td><strong>Accessibility:</strong>&lt;br&gt;Native</td>
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<tr>
<td>Visitor</td>
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<td><strong>Incorporated Street Names</strong></td>
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<td><strong>Maps to Airport</strong></td>
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<tr>
<td><strong>Incorporated Timetables</strong></td>
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<tr>
<td><strong>Districts / Historic</strong></td>
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<tr>
<td><strong>Tourist Attractions</strong></td>
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<tr>
<td><strong>Legend / Key</strong></td>
</tr>
<tr>
<td><strong>Part of City Identity System</strong></td>
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</tbody>
</table>
Synthesis

Generative Matrices

Based on the information gained from the interpretive matrices, it was evident that a generative matrix would be useful. A generative matrix aids in developing new ideas and potential solutions. It is similar to an interpretive matrix in that it uses meaningful axis labels that cross-reference each other. It creates new, often unexpected directions for exploration.

In the matrix below, physical locations as they relate to context characteristics were cross-referenced. Criteria for each axis were selected based on environmental observation, as well as information gathered in the research stage of the project. The audit of existing environmental solutions defined which environments needed attention, and illustrated the need for new wayfinding design considerations. Initial design approaches were generated to correspond with each intersection on the matrix. These studies influenced future application decisions for the thesis project.

Environmental Information Design: Enhancing the Wayfinder’s Experience

<table>
<thead>
<tr>
<th>Physical Locations</th>
<th>Pedestrian Area</th>
<th>Transit Area</th>
<th>Shared Area</th>
<th>Above Ground</th>
<th>Below Ground</th>
<th>Sheltered</th>
<th>Unsheltered</th>
<th>Indoor Space</th>
<th>Outdoor Space</th>
<th>Lighting</th>
<th>Materials</th>
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<tr>
<td>Airport</td>
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<td>Train Station</td>
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<td>City Streets</td>
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<td>Business District</td>
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<td>Museum District</td>
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<td>Tourist Attraction</td>
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</table>
**Synthesis**

In the matrix below, audience profiles, as they relate to experience types and goals, were cross-referenced. This helped define differences among travelers and the kind of wayfinding experience they might seek or encounter. Not every idea generated from this matrix directly influenced the final thesis application. However, the overall process of planning for specific users and a range of experiences directly influenced design decisions and considerations in the final wayfinding system design.

### Environmental Information Design: Enhancing the Wayfinder’s Experience

<table>
<thead>
<tr>
<th>Audience Profile</th>
<th>Planned</th>
<th>Spontaneous</th>
<th>Familiar</th>
<th>New</th>
<th>Targeted</th>
<th>General</th>
<th>Required</th>
<th>Optional</th>
<th>Outdoor Space</th>
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<tbody>
<tr>
<td><strong>Tourist</strong></td>
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<td>Couple with Children</td>
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<td>Native Language</td>
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Synthesis

Employment of the Matrix

Each intersection of the generative matrices was explored as a means to identify specific considerations and to initiate ideation. Note cards were used to categorize and organize thoughts and ideas. This led to future brainstorming, ideation and implementation directions. Below are three examples of ideation inspired by specific intersections within the matrices.

Context Characteristics / Physical Locations
Ideas were generated specific to a pedestrian area in an airport environment. This note card explored a particular solution to this design problem.

Experience Types and Goals / Audience Profiles
Notes were made about the wayfinding goals of a native working resident seeking a spontaneous experience in the city.

Experience Types and Goals / Audience Profiles
Notes were made about the wayfinding goals of a non-native tourist seeking a familiar experience in a new city. Specific considerations, ideas and future goals were listed.
Ideation

The ideation phase explored several possibilities for the application’s final form. Various methods of brainstorming were helpful in generating a range of possibilities, such as mindmapping and forced juxtaposition. The ideation led to more formalized decision making in the implementation stage.

Mindmapping

Mindmapping is a useful brainstorming tool that organically generates associations that may not have naturally occurred. Often used in creative writing exercises, it relies on words and begins with a central concept as a focal point. Other words branch off the central concept as the process unfolds. It is a spontaneous, intuitive method. Internal connections can then be identified to generate ideas.

Many mindmaps were created to make associations between words and ideas related to the thesis project. These mindmaps centered around concepts such as city, traveler, information, map and transportation. Ideation was then generated based on interesting or unexpected results within the “branches” of the mindmap.
Ideation

Below are two examples of how one mind map was used to influence various design solutions within a wayfinding environment. The sketches reflect ideas for a city walking tour.

From the "Map" mindmap, various words were selected to inspire initial ideation.

Selected words from the mindmap were used to inspire a map for a city walking tour. This initial sketch was based on the idea of navigation by constellations.

The same selected words from the mindmap were again used to develop a walking tour for a city. This initial sketch explores installing physical frame-like structures in the environment. Pedestrians could look through these frames to identify city landmarks and attractions.
Ideation

Forced Juxtaposition

Forced juxtaposition is a method that can be used in ideation and brainstorming. This method employs lists of attributes. After each attribute, any number of alternatives are listed. Then, random selections are made from each list. These selections are intended to inspire sketches and ideation. Not every idea generated from forced juxtaposition was used in the final design application. However, the process of making random associations inspired new and useful wayfinding solutions - an important goal of this thesis project.

One final selection from the forced juxtaposition reads: concrete, floor / street, city street / street corner, sequential / systematic, downtown area. This list of words was then used to generate sketches and ideation.

The above list of words inspired sketches for a city walking tour. The walking tour would be indicated by colored concrete paths throughout a downtown area, with markers at every path intersection or street corner.
Ideation

Toronto as a Model City

Though many methods of brainstorming were implemented and a wide range of ideation was generated, there remained the challenge of identifying a final application solution that would offer a new approach to wayfinding. With so many wayfinding systems that are constantly being renovated and redesigned, it was important for this thesis to reach beyond common or generic solutions. While early ideation was useful, it became necessary to focus attention on one specific city and its transportation system.

Toronto, Canada was selected as the model city for this project. With a population nearing 700,000 and a transportation system that includes bus, tram and subway, Toronto is in need of an improved wayfinding system. Planned research trips to the city provided opportunities for image gathering, evaluation of the city’s transportation system and brainstorming for environmental solutions. Specific exploration and documentation of the city’s various districts and subway stations defined directions for potential concepts.

Itineraries were planned for research trips to Toronto. It was necessary to evaluate the city’s overall wayfinding system. This was achieved by exploring each district and visiting major subway stations. It incorporated travel by foot, tram and bus.
Ideation

Scoring

During Toronto research trips, a method called “scoring” was used to gather information. A “score” guides people in an understanding of a course of action. In Lawrence Halprin’s book, RSVP Cycles, a score is explained as anything from sheet music to a grocery list. In the case of this thesis, identical copies of a map were used to “score” specific areas of Toronto according to identified criteria such as heavy foot traffic, transit connections and existing signage locations. When overlaid, interrelationships and connections were revealed that helped to assess the city’s needs. This approach identified certain subway stations as key locations for further design development. Below is an example of how “scoring” was implemented. Maps were overlaid to make associations and connections around the city. Examples of maps used to “score” Toronto are presented below and on the following page.
Ideation

This map scores “Transit Activity” in downtown Toronto. It specifically targets the heaviest transit activity in the area (including the highway).

This map scores “Foot Traffic: Unwelcome / Uneasy” in downtown Toronto. Areas of uneasy foot traffic are often dirty, crowded and potentially dangerous.
Ideation

Initial Stages

As a result of brainstorming and ideation, an improved wayfinding project for Toronto’s subway system was decided on. This project concentrated on the downtown area, where subway stations were in most need of improvement. This area of the city reflects the least renovated section of the subway system. Solutions within this system include street-level and below-ground directional signage. The complete journey from street to subway station platform was evaluated and addressed. Initial ideation included improved subway station indicators at street level, as well as icon simplification and general signage standards.

To the left is an example of existing subway station signage in Toronto. Below is some initial ideation to improve this signage. Subway station signage at street level is often vertical, and arbitrarily implemented into the existing environment. It was later decided that a more horizontal format honoring the existing architecture would be a stronger design decision for this signage. Final design solutions can be found in the Implementation section.
Initial design decisions were based on certain aspects of Toronto’s existing system. Because the typography and color palette are similar, the improved system was easily integrated into the existing system. Transportation icons and color were introduced to suggest subway lines.

Subsequently, transportation icons were simplified to offer more recognizable, less complex representations of a subway, bus and tram.

The subway and bus icons were adapted from an existing international design standard for icons. The tram icon was designed to work with the existing system of icons. A white circle was placed behind each icon, to further strengthen the system.
Ideation

Visual Solutions for Subway Station Wall Space

It was important in this thesis project to explore new and unexpected applications for wall space within subway stations. Special attention was paid to this aspect of the project to achieve the most meaningful and effective design solutions for this challenge. Below are some early examples of possibilities for improved subway station identification. The design goals of this stage of the project were to provide a sense of place, while clearly informing travelers of their destination.
Ideation

A range of ideation was explored during this stage of the thesis project. The progression of design solutions is included throughout the remainder of this section of the documentation. The ideation focuses on identifying a design solution that effectively identifies approaching stations, while providing information specific to each subway stop. The ideation focuses on the four most traveled subway stations in Toronto’s downtown area: Queen’s Park, Museum, Union and College.

Below is a generative matrix used to develop new ideas and potential solutions for subway station wall space. The matrix explores the relationship between meaningful texture from the environment above ground and the station name itself. The following pages show the range of ideation influenced by selected intersections of the matrix.

### Integrating Meaningful Texture with Typography and Wall Space within Subway Stations

<table>
<thead>
<tr>
<th>Element</th>
<th>Style</th>
<th>gestural / expressive</th>
<th>intellectual / literary</th>
<th>constructional / geometric</th>
<th>playful / abstract</th>
<th>literal / realistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>grass</td>
<td>geometric shapes with grass texture</td>
<td>wall made of grass</td>
<td>grass texture at ground level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>flowing water</td>
<td></td>
<td>water transposed on something concrete</td>
<td>waterfall on station wall</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>textile used as a scroll</td>
<td>geometric pattern</td>
<td>wall hangings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>line</td>
<td>gestural outline of a museum or building</td>
<td>accentuate station name - illuminated manuscript</td>
<td>repetition of line in a pattern</td>
<td>detailed drawing of museum or building</td>
<td></td>
<td></td>
</tr>
<tr>
<td>stone</td>
<td>sculptural elements</td>
<td>engraved stone or concrete</td>
<td>mosaic tile pattern</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>glass</td>
<td>glass blocks in a meaningful pattern</td>
<td>layering glass sheets with imagery between</td>
<td>windows</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>repetition of type to imitate the page of a book</td>
<td>typography used in a grid</td>
<td>enlarged, exaggerated letterforms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>photographic imagery</td>
<td>imagery implying movement and motion</td>
<td>unnatural color palette or imagery out of focus</td>
<td>literal photograph of a museum or building</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Ideation

In this example, grass texture was combined with typography to reference the nearby park.

Museum Station included a repetition of texture from an exhibition at the nearby Royal Ontario Museum.
In this example, the grass texture was expanded to fill the entire wall, and an outline of the nearby parliament building was added.

Here, Union Station combines an outline of the CN Tower, as well as sky and building texture. This references the downtown atmosphere and tall buildings found above this station.
Ideation

Repetition of typography was also explored to reinforce station names. This later influenced the large station names found in the final design solutions.

Repetition of station names as well light elements were explored to emphasize station identity.
Implementation

Visual Organization

As a unifying structure within the system, a grid was incorporated into the design of all signage solutions for this project. This created a standard for all signage design, resulting in a cohesive system that is recognizable to the user in a variety of physical settings and situations.

Other Design Decisions

Univers was chosen as the typeface for the wayfinding system – and for this thesis documentation as well – because of its simplicity, legibility at various sizes and wide range of typefaces, weights and slants within the type family. Each subway line is visually depicted by a band of color. For travelers who may be color blind, text is also included. The transportation icon appears on the signage, as appropriate. This provides additional visual communication for travelers unable to read directions or subway station names.
Implementation

Subway Signage at Street Level

Street signage provides directional arrows and distance in meters to the next station. City signage, already found around Toronto, can be easily adapted to the grid to reduce an overabundance of signage. Some colors have been taken from existing city standards. Blue represents museums and galleries, and brown represents historic areas and buildings. Orange was introduced in this study to represent tourist attractions and destinations.
Implementation

Before

After
Implementation

Subway Station Identification

All signage complies with the grid and includes the subway icon. Each subway line is visually depicted by a band of color. For travelers who may be color blind, text is also included. Subway station identification includes signage directing travelers at the street level to subway station entrances, as well as the signage appearing at the station entrance.
Implementation

Before

After
Implementation

Before

After
Implementation

Before

After
Implementation

Directional Maps

In the development of new solutions for this study, signage at subway station entrances includes large maps of the surrounding area. The maps are located above and below ground. They indicate street entrances, as well as area attractions. This will help travelers pinpoint their location, and know which entrance or exit to use. Travelers will be able to interact with these maps at eye-level, in an immediate space. These maps, along with well-lit entrances, will help reduce anxiety when transitioning from above to below ground.

The signage honors the existing architecture, and can be built to accommodate various environmental structures, such as existing concrete stairwells, covered entrances and overhangs.
Implementation

Before

After
Implementation

Before

After
Implementation

Before

After

Museum Station
Exits to Street and Area Attractions

- North Exit: Art Gallery of Ontario
- South Exit: Royal Ontario Museum
- West Exit: Royal Ontario Museum of Nature
- East Exit: Canadian National Exhibition
- Queen's Park
- Bloor Street West
- Charles Street West
Implementation

Signage Within Subway Stations

By continuing the wayfinding theme below ground, the signage system becomes familiar to travelers and creates a less stressful transition. Once in the station, travelers can easily navigate to their subway platform, without having to learn a new set of signs. Travel becomes more seamless and intuitive. Signage directing travelers to streetcars and buses incorporates Toronto's existing color scheme.
Implementation

Before

After
Implementation

Before

After
Implementation

Before

After
Implementation
Implementation

**Direction on Alternative Surfaces**

Directional markers on the ground, continuing from street level to below ground, lead travelers to their station and platform. Arrows lead travelers along the street and through subway stations, ending at the platform. The destination is indicated by a bullet, as depicted below. These directional markers can be incorporated into the existing environment. They can be constructed from various materials, painted or otherwise, including colored poured concrete, tile, bronze plating or glass blocks.

Providing directional markers on unexpected surfaces engages the traveler in a new way. By placing arrows on the ground, the traveler is directly connected to a path, which cannot be achieved by a handheld map or signage on street posts. The traveler is free to travel along this path, while simultaneously observing the surrounding environment.

Early ideation for the directional markers appears in the margin at left. Some of the colors have been reversed in the final application design, as depicted below. The implication of the “subway line” is indicated in this design by the arrow within each circle.
Implementation

Before

After

Yonge Lines
Implementation

Before

After
Implementation

Subway Line Directional Signage

Subway line signage found at each platform indicates direction of travel and future destinations. Simplification of existing signage provides hurried travelers with more clear information. Existing signage offers complicated maps of the entire subway system. This solution allows the user to concentrate on one section of their trip at a time. The green line segment represents the next three stops along the subway route. Below is an early version of the subway directional signage design. Initially, a black arrow indicated the direction of travel. In the final design solution, the arrow has been incorporated into the subway line itself, as shown in the bottom two examples on this page.

St. George West Green Line

Ossington Christie Bathurst St. George Bloor / Yonge

Yonge South Yellow Line

Rosedale Bloor / Yonge Wellesley College Dundas
Implementation

Before

After
Implementation

Before

After

Yonge South  Yellow Line

Rosedale  Bloor / Yonge  Wellesley  College  Dundas
Implementation

Identifying Approaching Stations

Information along the subway station walls has the potential to help travelers in subway cars more easily identify approaching stations. Repetition of station names and visual elements and meaningful texture referencing above ground area attractions reinforce station identity.

New approaches to station identification were explored for this thesis project. Large typographic elements were implemented to provide another level of recognition for travelers entering a subway station. As subway cars enter a station, lighting is activated. This alerts travelers to the approaching subway station. Travelers waiting at the platform also receive a visual signal that a subway car is entering the station. Station names were enlarged to the height of the wall, to provide an immediate visual reference from a moving subway car.
Implementation

Three systems were developed as proposals to improve station identification on subway station walls. Each system incorporates the use of typography and meaningful texture to communicate station identity and impart a sense of place.

System 1

This system demonstrates the progression from typography and texture to shapes and imagery that relate to above-ground attractions.
Implementation

System 2

This system incorporates typography with meaningful texture. Circular elements found throughout this wayfinding system are implemented here, as well. The typography and graphic elements would repeat along the subway wall.
Implementation

System 3

This system also incorporates typography with meaningful texture. Here, the textures of grass and cobblestone appear below the typographic elements. This references the natural placement of these surfaces above ground in the surrounding environment.
Implementation

Systems as Seen in Motion

Below are examples of how a traveler on a subway might view an approaching station. The large typography allows the station names to more quickly come into focus. When approaching at high speeds, repetition of station names and visual elements help to reinforce station identity.
Dissemination

Thesis Panel 1

The first panel introduced the thesis project and included the project definition, as indicated in the "navigation bar" at the bottom of each panel. It was important to clearly explain terms and concepts in this panel because it is the first panel encountered by the viewer.

Environmental Information Design
The Traveler’s Wayfinding Experience

Every traveler has known the feeling of being lost, disoriented or out of place in a certain environment. The experience of a city is different for every person. When a person is navigating a city, it is important that certain types of information be readily available and easily accessible. Transit systems like bus routes and subways need to be comfortable to both commuters native to the city and new tourists. Information design in the traveled environment plays an important role in aiding the traveler without being overbearing. It becomes part of the environment – an expected addition to the city that is both familiar and helpful.

This thesis focuses on a wayfinding system specifically for Toronto, Canada’s subway system. Attention has been given to both street-level and below ground environments. The transition from above to below ground, and identification of subway stations has also been addressed. Implementation of systems thinking in regard to the use of typography, color and symbols has resulted in a design solution that aims to improve Toronto’s existing system, and the overall wayfinding experience in this city.
Dissemination

Thesis Panel 2

The second panel explained the process of research and information gathering during the thesis project. A brief overview of wayfinding behavior was described to familiarize the viewer with spatial orientation and cognitive mapping. Imagery and descriptions related to the overview of existing systems was included.

Research and Information Gathering

During the progress of this thesis, many areas of research were identified and explored. Wayfinding behavior, such as spatial orientation and the way travelers react in certain situations was an important aspect of this project. Map designs within the thesis application were first influenced by cognitive mapping.

An audit of existing subway systems in selected major cities around the world helped to identify common or repeated design solutions in the environment. This type of research extended this thesis project beyond predictable or generic solutions, while incorporating elements that are proven to be universally successful.

An Overview of Existing Solutions

- **Baltimore, Maryland**: A map of the surrounding area is often incorporated into stations. This central fare-station symbol is a solution found in many cities.
- **Vienna, Austria**: Signage posted on utility poles in a station, generic solution. Often times, there can be an over abundance of signage posted thus creating clutter.
- **Munich, Germany**: Posters, in addition to maps, are a common solution to provide travelers with a sense of place.
- **London, England**: Color-coding is found in subway stations and on subway maps around the world. This helps travelers make associations within a wayfinding system.
- **Boston, Massachusetts**: Color-coding is found in subway stations and on subway maps around the world. This helps travelers make associations within a wayfinding system.
Dissemination

Thesis Panel 3

The third panel was intended to be a transition panel. Located on the reverse side of the second panel, it acquainted the viewer with the process of exploring Toronto during the thesis project. An explanation of these research trips was given, and “scoring” was also introduced. Imagery was included to familiarize the viewer with the process, and provide a sense of Toronto and its subway system.

Traveling the City

Based on research, Toronto, Canada was selected as a model city for this thesis project. With a population nearing 700,000, and a transportation system that includes bus, tram and subway, Toronto has the need for an improved wayfinding system. Planned research trips to the city provided opportunities for image gathering, evaluation of the city’s transportation system and brainstorming for environmental solutions. Specific exploration and documentation of the city’s various districts and subway stations was necessary in evaluating the city’s overall wayfinding system.

A method called scoring was used for information gathering during research trips. A score guides people in an understanding of a course of action. In Lawrence Halprin’s book, RSVP Cycles, a score is described as anything from sheet music to a grocery list. In the case of this thesis, identical copies of a map were used to score specific areas of Toronto according to identified criteria such as heavy foot traffic, transit connections and existing signage locations. When overlaid, interrelationships and connections were identified to assess the city’s needs. This approach revealed certain subway stations as key locations for further design development.
Thesis Panel 4

The final panel included the actual design application that had been completed up to that point. It was introduced as a work-in-progress and gave an overview of the grid and implementation of design solutions. This panel guided viewers to a pedestal with a bound book containing more detailed examples of the thesis application. “Before and after” images were included, as well as brief explanations of signage leading from street level to subway station platforms.

**Dissemination**

**Thesis Design Application**

**Enhancing the Environment**

Based on research, prototypical environmental design solutions were implemented into meaningful areas of Toronto, both above and below ground.

**Above Ground**

- Central, consistent, unobtrusive and universally accessible signage were designed.
- Signage provided clear direction to the next subway station. The grid accommodates a large number of internal signage and can be added on readily.
- Diagrams showing floors such as the street serve to improve pedestrian movement by directing traffic.
- Stations are identified by both color and language for people who may be visual impaired. Signage at stations is positioned to be easily recognized from different viewpoints.
- Maps to help people make their way at every station are placed. The signgan shows the existing architectural elements.

**Below Ground**

- Within each station, signage similar to those above ground identify what is on the opposite side of the station, including connecting entrances and exits.
- Signage meets the station is similar to that above ground. Diagrams of existing and imaginary stations help direct passengers to their platforms.
- Directional markers below ground continue the journey from street level and display where the final destination reached the street-level platform.
- At each platform signage displays direction of travel and future stops on the line.
- Requirements of station names and the use of imagery similar to instructions along existing streets are included. Signage provides information regarding tracking systems while on route.

Implementation
Retrospective Evaluation

As a means to evaluate this thesis project, it was important to receive feedback from an information design professional. The author contacted Ms. Sue Hope of the Toronto Transit Commission who agreed to review portions of this project applicable to Toronto’s transit system. Ms. Hope designed Toronto’s current system, which was the focus of this thesis project. She is now in the process of redesigning that system, and has recently begun renovating subway lines in the outlying areas of the city. It is important to note that the author of this thesis was not influenced by Ms. Hope’s recent design decisions. Not until this project was well underway did the author learn of renovations to the current system. Moreover, since the wayfinding system for the newer subway lines was under construction during the course of this project, it was unavailable for reference.

In her evaluation, Ms. Hope pointed out that for this project to receive serious consideration for implementation in a city, additional studies would be necessary. For example, travel behavior and physical limitations of travelers would need to be factored in. Demographics and Toronto’s multi-cultural population would need to be considered. Ms. Hope also noted that constraints unique to Toronto would limit certain design solutions. Traffic and safety regulations, weather conditions and transit authority restrictions were among the constraints she cited. Lastly, costs and materials would need to be considered.

In order to develop a wider range of design solutions, some pragmatic restrictions were not placed on this project. Thus, the scope of this thesis remained narrowly focused because of time constraints, and considerations such as those identified by Ms. Hope were not feasible. However, Ms. Hope’s feedback was useful and should not be overlooked. She emphasized that design solutions should be flexible, maintainable and cost effective. In addition, she stressed that when addressing a wayfinding solution for a city, it is important that signage should meet certain criteria and strive to:

- promote safe and effective use of the system
- provide clear, legible and visible statements
- provide a unifying identity for the system
- provide a consistent approach
- allow accessibility for all users.

This thesis has attempted to incorporate many of the same goals that Ms. Hope emphasized. Certain aspects of the application have evolved to better fulfill these goals, as well as to accomplish those set forth in the thesis project definition.
Conclusion

Outcome

The focus of this investigation was to implement a new wayfinding system in the city of Toronto. This project has successfully integrated an improved wayfinding system with the existing system found in Toronto’s downtown area. A more cohesive, systematic approach was introduced. This solution is one that could be applied to other cities worldwide to offer travelers a more familiar, efficient and pleasant wayfinding experience.

In researching this project, it became apparent that many existing wayfinding systems offer effective solutions. However, these solutions are often generic or lack innovation. Throughout this project, it was a challenge to recognize the positive elements of existing systems, and improve upon them in new and meaningful ways.

During this thesis, the author came to a new realization of the importance of environmental information design. It is essential that designers maintain an awareness of their responsibility to provide the public with creative, yet practical design solutions to everyday situations. By combining clear content, meaningful visual elements and artistic sensibility, designers can offer useful and innovative solutions and can make a real difference in our surroundings and the world in which we live.

Experience

From the earliest, conceptual stages to the realization of the final product, it is helpful for designers to remember these points:

- plan and organize all stages of the process
- develop time management skills
- prioritize and focus on each individual aspect of the project
- invite evaluation and remain open to constructive criticism
- strive for improvement throughout the project.
Glossary of Terms

Cognitive Map
An overall mental image or representation of the spaces and layout of a physical setting.

Cognitive Mapping
The mental structuring process leading to the creation of a cognitive map.

Dissemination
Plans for project distribution and future audience interaction.

Evaluation
Testing strategies used to judge ideation and resulting selection of possible design solutions.

Ideation
The generation of a conceptual solution and preparation of a range of preliminary design approaches.

Implementation
The refinement of a project, produced and demonstrated in its final application.

Information Design
The defining, planning and shaping of the contents of a message and the environments in which it is presented, with the intention of achieving specific objectives in relation to the needs of users.

Matrix
A situation or surrounding substance within which something originates, develops or is contained.

Pragmatics
The study of visual characteristics of signs and symbols, such as color, size and location.

Semantics
The relationships between symbols and the objects they represent.
Glossary of Terms

**Spatial Orientation**
The process of devising an adequate cognitive map of a physical setting, along with the ability to situate oneself within that representation.

**Syntactics**
The study of the formal, aesthetic properties of signs and symbols and their relationships to other symbols.

**Synthesis**
The defining of interrelationships and patterns, such as sorting, sequencing and ordering information.

**Typography**
The visual representation of language.

**Wayfinding**
Finding one’s way to a destination; spatial problem solving comprising three interdependent processes: decision making, decision executing and information processing.
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Appendices

Appendix A - *Comparative Matrix of U.S. and International City Wayfinding Systems*

Appendix B - *Comparative Matrix of U.S. and International City Transportation Maps*

Appendix C - Thesis Planning Document
# Appendix A

## A Comparative Matrix of U.S. and International City Wayfinding Systems

<table>
<thead>
<tr>
<th>Pedestrian Considerations</th>
<th>Intuitive Aspects</th>
<th>Combined Efforts with other City Organizations</th>
<th>Target Audience:</th>
<th>Symbol / Icon System</th>
<th>Focus on Specific Important Area of City</th>
<th>Sequential Aspects</th>
<th>Enhanced Public Image</th>
<th>Transportation Considerations</th>
<th>Complete Transportation System Included</th>
<th>Historic Considerations</th>
<th>Color Coding</th>
<th>Improved Access / Clarification</th>
<th>Provide City Standards</th>
<th>Language / Cultural Considerations</th>
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### Appendix B

#### A Comparative Matrix of U.S. and International City Transportation Maps

<table>
<thead>
<tr>
<th>System Approach (Unified Look &amp; Feel)</th>
<th>New York, NY</th>
<th>Madison, WI</th>
<th>Washington, DC</th>
<th>Chicago, IL</th>
<th>Boston, MA</th>
<th>Paris, France</th>
<th>Lindau, Netherland</th>
<th>Vienna, Austria</th>
<th>Toronto, Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
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</tr>
</tbody>
</table>

| Multiple Systems on One Map          | ●            | ●           | ●              | ●           | ●          | ●             | ●                 | ●               | ●              |

| Easily Understood Color Coding      | ●            | ●           | ●              | ●           | ●          | ●             | ●                 | ●               | ●              |

| Accessibility:                     | ●            | ●           | ●              | ●           | ●          | ●             | ●                 | ●               | ●              |
| Native                              | ●            | ●           | ●              | ●           | ●          | ●             | ●                 | ●               | ●              |
| Visitor                             | ●            | ●           | ●              | ●           | ●          | ●             | ●                 | ●               | ●              |

| Incorporated Street Names          | ●            | ●           | ●              | ●           | ●          | ●             | ●                 | ●               | ●              |

| Maps to Airport                    | ●            | ●           | ●              | ●           | ●          | ●             | ●                 | ●               | ●              |

| Incorporated Timetables            | ●            | ●           | ●              | ●           | ●          | ●             | ●                 | ●               | ●              |

| Districts / Historic               | ●            | ●           | ●              | ●           | ●          | ●             | ●                 | ●               | ●              |

| Tourist Attractions                | ●            | ●           | ●              | ●           | ●          | ●             | ●                 | ●               | ●              |

| Legend / Key                       | ●            | ●           | ●              | ●           | ●          | ●             | ●                 | ●               | ●              |

| Part of City Identity System       | ●            | ●           | ●              | ●           | ●          | ●             | ●                 | ●               | ●              |

| Time Factors (Night Buses)         | ●            | ●           | ●              | ●           | ●          | ●             | ●                 | ●               | ●              |

| Special Considerations             | ●            | ●           | ●              | ●           | ●          | ●             | ●                 | ●               | ●              |
| (Physically Impaired, Restrooms)   | ●            | ●           | ●              | ●           | ●          | ●             | ●                 | ●               | ●              |
Appendix C

The following is a planning document for this thesis project. It was completed as a means to understand the scope of the project. It outlines stages and goals of the project, and was used as a guide for the thesis itself.
Environmental Information Design
Enhancing the Traveler’s Wayfinding Experience

Lyndsay W. Beauchamp
Thesis Planning Report
Graduate Graphic Design
## Committee Members

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lyndsay Beauchamp</td>
<td>115 Andrews Memorial Dr. Rochester, NY 14623</td>
<td>585 820 1860</td>
<td><a href="mailto:lyndsayb@excite.com">lyndsayb@excite.com</a></td>
</tr>
<tr>
<td>Deborah Beardslee</td>
<td>Rochester Institute of Technology</td>
<td></td>
<td><a href="mailto:dabfa@rit.edu">dabfa@rit.edu</a></td>
</tr>
<tr>
<td></td>
<td>School of Design</td>
<td></td>
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</tr>
<tr>
<td></td>
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<tr>
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<tr>
<td>R. Roger Remington</td>
<td>Rochester Institute of Technology</td>
<td></td>
<td><a href="mailto:rrrfaa@rit.edu">rrrfaa@rit.edu</a></td>
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<tr>
<td>Bruce Ian Meader</td>
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Proposal

This past summer I attended an information design academy that raised my awareness of the need for improved information graphics directed towards a more universal audience. This proposed thesis project will involve wayfinding in a traveler’s environment. Central to the project will be a study of modes of navigation as they relate to the unfamiliar traveler. This might include map reading, traveling a transportation system, and cognitive mapping.

My thesis application will be a wayfinding program targeted at a specific travel environment or city tourist area (such as a subway station or museum district). Typography, color, systems thinking and symbols will provide a more comprehensive formal design solution. This presentation will be an extensive evaluation of the users’ needs, demonstrating a more effective navigational system.
Documentation of Need

At a recent summer academy sponsored by the International Institute of Information Design (IIID) in Vienna, Austria, I was exposed to many elements of environmental information design. The scope of the program, entitled 'Traveling the City,' involved an evaluation of Vienna’s transportation system and related information design throughout the area. Upon arriving in Vienna, we were asked to find our way to our accommodations and to the academy’s venue across town, without any assistance or direction. We were supplied with one map in German. Even after some preparation, I was very unprepared to deal with subway station in a language I did not speak, with unfamiliar signage, and the reality of having to manage multiple wayfinding systems, alone, for the first time in this city.

Information design, in the traveled environment, plays an important role in determining the type of experience a traveler will have. I went through the same emotions and processes that many travelers do when first introduced to a foreign environment. Wayfinding as purposive behavior involves attributes of the traveler and attributes of the environment. People automatically look for indicators and create relationships in order to feel more comfortable in their surroundings.

Some travel locations have effective design systems such as clear signage and recognizable symbols and language. Overall, however, tourist areas and centers of travel, like airports and subway stations, are largely in need of clearer, more universal design. Information design has the potential to make urban wayfinding more seamless. Both residents and visitors in a city may participate in the same commute, but the foreigner will experience it differently. Systems thinking in design decisions can also provide a further level of coherence, through color coding, typography and symbols. There are many existing problems that need to be addressed in order to create a more comfortable experience for native subway commuters, visiting sightseers, and international businessmen alike. There is an ongoing need for familiar and easily navigated wayfinding systems that accommodate a variety of types of users.
**Problem Statement**

Based on my past travel encounters, this proposed thesis project will explore environmental information design and ways in which it can enhance the traveler’s wayfinding experience. The proposed thesis project will involve wayfinding in a traveler’s environment. Central to the project will be a study of modes of navigation as they relate to the unfamiliar traveler. Map reading, negotiating a transportation system and cognitive mapping impact the type of experience a person will have. This project will include a consideration of these influences as a means to creating a more navigable situation.

My thesis application will be a wayfinding program targeted at specific travel environment or city tourist area (such as a subway station or museum district). Specific attention will be given to signage, maps, and pictograms as means of universal communication. Implementation of typography, color, systems thinking and symbols will provide a more comprehensive formal design solution. An extensive evaluation of the users’ needs will facilitate a more effective navigational system application.
Precedents

The labyrinth is both the actuality and symbolic nature of disorientation. Today, many maps and navigational systems recall this idea of the labyrinth, causing information designers to address this inexhaustible problem. The relationship of user and environment has been explored throughout history, and will offer significant influence in my own evaluation a topic ever in need of reevaluation and improvement.

Henry Beck’s London Underground Map, created in 1933, paved the way for the representation of direction, space, and time in map design. His ingenuity set universal standards among transportation design of many international cities from that point on.

Massimo Vignelli created a Unigrid system in 1977 for the National Parks Service, as a means to unify and bring clarity to many types of information. Later, his design of the New York Subway system, though ultimately rejected by New Yorkers, was based on the idea of simplification of elements, much like Beck’s design.

In the 1970’s, the Society of Environmental Graphic Designers (SEGD) was formed in Massachusetts. This group of designers has taken an important stance in increasing design standards among graphic designers and architects. Educational improvement in the area of environmental communication is also a priority for SEGD.

Richard Saul Wurman has published a number of texts on information design and its effectiveness. Information Anxiety: What to do when Information Doesn’t Tell You what You Need, speaks on making design more accessible and meaningful. Wurman’s Man-made Philadelphia is a guide to Philadelphia’s physical and cultural environment through simplified representation of the city, in an attempt to make the city more accessible and inviting.

Paul Arthur and Romedi Passini’s book Wayfinding: People, Signs, and Architecture offers a comprehensive look at wayfinding as a process, and how designers are handling different issues concerning the topic of navigation and the environment.
**Mission Statement**

This thesis is a demonstration project about environmental information design and wayfinding as it relates to the needs of the unfamiliar traveler. It will lead to the development of a more universal navigational system for travelers in a specific environment.

<table>
<thead>
<tr>
<th>Goals</th>
<th>Objectives</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>To develop a project plan</td>
<td>Given the topic of environmental information design, the designer will evaluate existing information to determine relevance</td>
<td>The designer will conduct library and internet searches to obtain current information on the topic</td>
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<tr>
<td></td>
<td>From the evaluation of information, the designer will assess the needs of users and organize the data for planning use.</td>
<td>The designer will compile a working bibliography with which to conduct further research</td>
</tr>
<tr>
<td></td>
<td>Based on the needs assessment, the designer will evaluate the plan and modify accordingly</td>
<td>The designer will research the scope of the project to understand the needs of the user and determine the need for the project</td>
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<td></td>
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<td>The designer will define the need and benefit for a more universally considerate wayfinding system</td>
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<td>The designer will create an evaluation process</td>
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<td>Goals</td>
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<tr>
<td><strong>To clearly define the problem</strong></td>
<td>Given the existence of the needs assessment, the designer will gather research to develop a detailed plan of action to provide structure for the thesis project.</td>
<td>The designer will research books journals pertaining to wayfinding and information design.</td>
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<tr>
<td></td>
<td>Using research data, the designer will identify existing problems to aid in the definition of the problem and need</td>
<td>The designer will research the need for and benefits of clear and easily navigated wayfinding systems.</td>
</tr>
<tr>
<td></td>
<td>Based on the problem, the designer will evaluate and modify accordingly</td>
<td>The designer will reference work by experts in the field of information design and wayfinding.</td>
</tr>
<tr>
<td><strong>To evaluate existing systems through research gathering</strong></td>
<td>Given the design problem, the designer will conduct research on existing systems in order to build comparative data</td>
<td>The designer will review fall quarter planning document, and modify if necessary.</td>
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<td>Using the research, the designer will organize information in order to further define the problem and potentially reach a solution</td>
<td>The designer will use previous evaluation process.</td>
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<td>Based on the organized information, the designer will evaluate the project and modify accordingly</td>
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</table>
**Goals**  

To ideate potential solutions  

**Objectives**  

Given the organized data, the designer will generate a range of brainstorming ideation that will lead to application solution  

Strategies  

The designer will use various brainstorming methods, such as mind mapping, to generate a range of possibilities  

The designer will use visual organizational methods to reach possible solutions  

The designer will sketch out possible solutions, refining as the process unfolds  

The designer will use thumbnails to investigate various applications and system solutions  

The designer will use previous evaluation process  

Considering the possible solutions, the designer will evaluate the project and modify accordingly  

**To provide a successful design solution that incorporates user considerations**  

Based on the possible solutions, the designer will create a more universal and effective wayfinding system  

The designer will refine solutions  

The designer will consider the best refinements to produce final application solution  

Given the system, the designer will create an application that meets the needs of the user and encompasses the scope of the project definition  

The designer will consider and evaluate print and environmental solutions  

The designer will assemble final solution(s)  

Given the application, the designer will evaluate the project and modify accordingly  

The designer will use previous evaluation process
<table>
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<tr>
<th>Goals</th>
<th>Objectives</th>
<th>Strategies</th>
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<tbody>
<tr>
<td>To disseminate the application</td>
<td>Given he application, the designer will exhibit the final application as a means of disseminating thesis project to peers and general public</td>
<td>The designer will buy materials and produce final design solutions</td>
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<td>The designer will document the project based on all ideation and solutions to create further documented distribution</td>
<td>The designer will assemble project information</td>
</tr>
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<td>Based on the document, the designer will evaluate the project and modify accordingly</td>
<td>The designer will produce the thesis document</td>
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<td>The designer will include feedback in the final report</td>
<td>The designer will use previous evaluation process</td>
</tr>
<tr>
<td>To evaluate the project and modify accordingly</td>
<td>Given the documentation, the designer will ask committee members to evaluate project for potential project adjustments and corrections</td>
<td>The designer will document and discuss feedback from committee at last meeting</td>
</tr>
<tr>
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<td>The designer will generate a questionnaire to acquire feedback from the general public</td>
<td>The designer will use committee member feedback to make final adjustments to the thesis document</td>
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<td>Given the feedback from the committee, the designer will produce a final solution</td>
<td>The designer will disseminate questionnaires at the gallery show</td>
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<td>The designer will include feedback in the final report</td>
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<td>The designer will make final corrections to the thesis report, print and bind the final document</td>
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Environmental Information Design
enhancing the traveler’s wayfinding experience

Manage Project
- Designer
  Needs Analysis 1.1
- Configure Thesis Committee 1.2
- Gather resource people and materials 1.3 1.0

Define Need
- Problem Definition 2.2
  Evaluate: assess needs 2.3 Use data in decision making 2.4 2.0

Design Project
Plan Project
- Planning Report
  mission statement, goals, objectives, strategies, project diagram, time-line, evaluation plan 3.1.1
  Evaluate: state design criteria 3.1.2 Use data in decision making 3.1.3 3.1

Research Project
- Data Collection
  Books, journals and internet search 3.2.1
- Organize Data 3.2.2
  Evaluate: assess collected data 3.2.3 Use data in decision making 3.2.4 3.2

Idenate Solutions
- Brainstorm Solutions 3.3.1
- Create Possible Solutions 3.3.2
  Evaluate: compare solutions 3.3.3 Use data in decision making 3.3.4 3.3 3.0

Implement Solutions
- Create Wayfinding System
  Compare Solutions 4.1.1
  Assemble Parts 4.1.2
- Construct Application
  Buy Materials 4.1.3
  Assemble Parts 4.1.4
  Evaluate: analyze system and application 4.3 Use data in decision making 4.4 4.0

Evaluate Project
- Meet with committee and discuss entire project 6.1
- Provide questionnaire for public 6.2 6.0

Disseminate Project
- Create Panel Display 5.1
- Display project in Bevier Gallery 5.2
  Evaluate: create thesis document 5.3 Use data in decision making 5.4 5.0 0.0
Evaluation Plan

This thesis project contains an evaluation plan for each module of the project network diagram. The evaluation plan provides evaluative criteria in the form of a matrix to show how each aspect of the project plan can be evaluated. This matrix details evaluation methods for particular phases of the project, methods and questions the designer will implement and consider in order to assess the thesis project. An Input, Process, Output diagram is also included for module 3.0 (Design Project) of the project diagram. This shows the process of specific elements of the projects being applied to the actual process, and the results thereof.

Other forms of evaluation will include:

Weekly evaluation with chief advisor
Periodic committee meetings
Periodic evaluation by outside expert(s)
Thesis show evaluation (surveys and/or questionnaires)

Final questions the designer will be asking to evaluate the total project might include:

Does the final project meet all goals and objectives within the project scope?
Does the final project meet all user and project needs?
<table>
<thead>
<tr>
<th>Phase</th>
<th>Evaluation</th>
<th>Method</th>
<th>Questions</th>
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<tbody>
<tr>
<td>Definition of Need</td>
<td>Assess Needs</td>
<td>Needs Analysis</td>
<td>Is a clear problem definition outlined?</td>
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<td>Project Development</td>
<td>Is there a definite need defined and proved?</td>
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<td>State Design Criteria</td>
<td>Project Planning Report</td>
<td>Was sufficient research gathered?</td>
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<td>Was the information organized to further define the problem?</td>
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<td>Assess Collected Data</td>
<td>Relate and apply collected</td>
<td>Was a variety of solutions explored?</td>
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<td>data to needs of thesis project</td>
<td>Did the gathered research influence the solutions?</td>
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<td>Ideate Solutions</td>
<td>Compare Solutions</td>
<td>Committee feedback and personal</td>
<td>Does the solution fully address the project’s needs and problems?</td>
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<td>assessment</td>
<td>Does the solution meet the needs of the user?</td>
</tr>
<tr>
<td>Implement Solutions</td>
<td>Analyze System</td>
<td>Relate application and solution to</td>
<td>Is the assembled application meet all communication objectives and goals?</td>
</tr>
<tr>
<td></td>
<td>and Application</td>
<td>project needs and criteria</td>
<td>Is the final wayfinding system successful in a user setting?</td>
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<tr>
<td>Disseminate Project</td>
<td>Create Thesis</td>
<td>Surveys and questionnaires</td>
<td>Is the final thesis document complete?</td>
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<td>Document</td>
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<td>Does it include all feedback from thesis show and suggestions and committee feedback?</td>
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# Design Project 3.0

## Plan Project

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<td>mission statement, goals, objectives, strategies, project diagram, time-line, evaluation plan</td>
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<tr>
<td>Evaluate: state design criteria</td>
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<td>Use data in decision making</td>
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## Research Project

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<td>Organize Data</td>
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<tr>
<td>Evaluate: assess collected data</td>
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<tr>
<td>3.2.3</td>
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<tr>
<td>Use data in decision making</td>
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## Ideate Solutions

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<td>3.3.2</td>
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<tr>
<td>Evaluate: compare solutions</td>
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## Plan Project 3.1

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<tbody>
<tr>
<td>Planning Report</td>
</tr>
<tr>
<td>mission statement, goals, objectives, strategies, project diagram, time-line, evaluation plan</td>
</tr>
<tr>
<td>Evaluate: state design criteria</td>
</tr>
<tr>
<td>Use data in decision making</td>
</tr>
</tbody>
</table>

## Input

<table>
<thead>
<tr>
<th>Clarified and defined need for project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thesis planning calendar</td>
</tr>
<tr>
<td>Preliminary research</td>
</tr>
<tr>
<td>Outlined project scope</td>
</tr>
</tbody>
</table>

## Process

| Create planning report to include: |
| mission statement |
| goals |
| objectives |
| strategies |
| project diagram |
| time line |
| evaluation plan |

## Output

| Outlined plan for research in the form of a complete planning document |
| Time line to structure project |
| Project anatomy |
| Strategies, goals, and evaluation for each stage of the project |

| Evaluation and stating of design criteria |
### Research Project 3.2

<table>
<thead>
<tr>
<th>Data Collection</th>
<th>Organize Data</th>
<th>Evaluate: assess collected data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Book, journal and internet search</td>
<td>Use data in decision making</td>
<td></td>
</tr>
</tbody>
</table>

#### Input
- Plan to fulfill a need
- Library and internet sources
- Goals, objectives and strategies
- Assumptions
- Identification of existing design problems
- Evaluation methods

#### Process
- Data collection to include:
  - books
  - journals
  - internet search
- Organization of data
- Assessment of data

#### Output
- Data that outlines precedents in information design and offers methods for more successful, universal wayfinding design
- Conclusions (cognitive solutions, readability, universality)
- Structure to aid Ideation for application

### Ideate Solutions 3.3

<table>
<thead>
<tr>
<th>Brainstorm Solutions</th>
<th>Create Possible Solutions</th>
<th>Evaluate: compare solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Use data in decision making</td>
</tr>
</tbody>
</table>

#### Input
- Plan to fulfill a need
- Library and internet sources
- Goals, objectives and strategies
- Assumptions
- Identification of existing design problems
- Evaluation methods

#### Process
- Brainstorming methods to include:
  - mind map
  - matrix
  - others
- Creation of possible solution
- Ideation for application

#### Output
- Design solutions that meet needs of project and address problems within the project’s scope
- Ideation for more universal wayfinding systems to be implemented in a more final solution
Dissemination Plan

The final thesis application will take the form of a wayfinding system in a traveled environment. It will be disseminated amongst peers, thesis committee, select experts in the field and the general public at the thesis show exhibit. After receiving feedback from each group, appropriate changes will be made. A summary of the thesis project will also be created to disseminate the project to potential employers or committees or organizations that would take interest in this type of solution in information design.

1 Peers
2 Committee
3 Experts
4 Report
5 Potential Employers
<table>
<thead>
<tr>
<th>Thesis Calendar</th>
<th>RIT Calendar</th>
<th>Calendar</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>September</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Proposals signed</td>
<td>06 Fall Quarter begins</td>
</tr>
<tr>
<td></td>
<td></td>
<td>02 Labor Day</td>
</tr>
<tr>
<td><strong>October</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Last day to withdraw</td>
<td>14 Columbus Day</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14 Columbus Day</td>
</tr>
<tr>
<td></td>
<td></td>
<td>27 Daylight Savings ends</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>31 Halloween</td>
</tr>
<tr>
<td>02</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>November</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 Planning Report Due</td>
<td>13 Last day of class</td>
<td></td>
</tr>
<tr>
<td>21 Fall/Winter break</td>
<td>05 Election Day</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>11 Veterans Day</td>
</tr>
<tr>
<td></td>
<td></td>
<td>28 Thanksgiving</td>
</tr>
<tr>
<td><strong>December</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>02 Research and Analysis</td>
<td>02 Class starts</td>
<td></td>
</tr>
<tr>
<td>20 Committee meeting</td>
<td>21 Last class before break</td>
<td>07 Last night of Chanukah</td>
</tr>
<tr>
<td></td>
<td></td>
<td>22 First Day of Winter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25 Christmas Day</td>
</tr>
<tr>
<td><strong>January</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22 Committee meeting</td>
<td>06 Class begins</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>01 New Year's Day</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19 Designer's Birthday</td>
</tr>
<tr>
<td><strong>February</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01 Presentation to 1st yr grads</td>
<td>21 Last day of class</td>
<td></td>
</tr>
<tr>
<td>19 Committee meeting</td>
<td>14 Valentine's Day</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td><strong>March</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19 Committee meeting</td>
<td>01 Winter/Spring break</td>
<td></td>
</tr>
<tr>
<td>10 Resume class</td>
<td></td>
<td>17 St. Patrick's Day</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 First Day of Spring</td>
</tr>
<tr>
<td>31 Thesis show goes up</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>April</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>04 Gallery opening</td>
<td>18 Last day to withdraw</td>
<td>00 Easter</td>
</tr>
<tr>
<td>17 Committee Meeting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 Thesis show comes down</td>
<td></td>
<td></td>
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<tr>
<td><strong>May</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 Thesis sign-off meeting</td>
<td>16 Last day of class</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>24 Commencement</td>
</tr>
</tbody>
</table>