# INTERACTIONS BETWEEN PHYSICAL AND VIRTUAL SPACE

*The Influence of Game Environments on Graphic Design Problem Solving*

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This thesis project is dedicated to Rochester, San Diego, and home.

# THESIS PROJECT DEFINITION

*Defining the thesis topic and its proposed organizational structure*

## Introduction

Board games and video games unfold information to their players in new environments – environments with which players may have no direct relationship with such as historical and futuristic settings, or environments that are fabricated from fairy tales and imagination. The choices involved in the development of such environments are essential to the successful transfer of information between game and players, as well as from player to player. How do players travel through these constructed environments? How do these constructed environments reveal information and encourage comprehension throughout the game? Strategies related to navigation and visual coding are keys to providing an entrance, a passage, and an exit to any environment, real or abstract.

Through principles related to information design and systems design, graphic design plays a large role in the wayfnding needs prompted by various types of abstract environments, from actual three-dimensional exhibitions, to destinations in cyberspace, to written textual experiences. Relevant to environments found in board games and video games, graphic design visually translates characteristics of game play including story, structure, and atmosphere.

## Objective

Taking an in-depth look into how graphic design is used to successfully open doors to and encourage the journey through conceptual environments can provide an enhanced understanding of visual communication and visual perception in virtual spaces. This may lead to the creation of improved strategies for navigating through virtual environments, helping to create a system that will more closely reflect wayfnding and navigation in the physical world.

Aspects of the study will include the visual translation of time, space, motion, and emotion through conceptual, spatial, and color considerations. Furthermore, understanding visual coding and other navigational aspects will involve the study of information design, specifcally wayfnding and mapping. Comparisons will be drawn between urban design and the planning of a real city environment, and that of an imaginary city or society. A survey and analysis of board and video game designs, as well as their influences and relationships, will be included in this exploration.

## Selected Key Questions

*These key questions are detailed on pages 15-28.*

1  How does graphic design help lead a player into, through, and out of
   an abstract environment?

2  How does systems design help players go through a game that transitions
   between more than one environment?

3  How are space, time, and movement generated through positioning and
   placement of imagery and typography?

4  What role does information design play in the depiction of virtual territory,
   zones, and regions?

5  How does graphic design assist in generating interaction in a game;
   how does it facilitate and sustain interaction?

6  How have board games influenced video games? How have video games
   influenced board games?

7  What types of cultural/societal symbols can be included in the design solution
   in order to maintain a commitment to what society already knows,
   while introducing them to new environments?

## Associated Areas of Study

Motion Studies/Storyboarding
Film Studies/Art Direction
Theater Studies/Set Design

Urban Planning
Exhibition Design
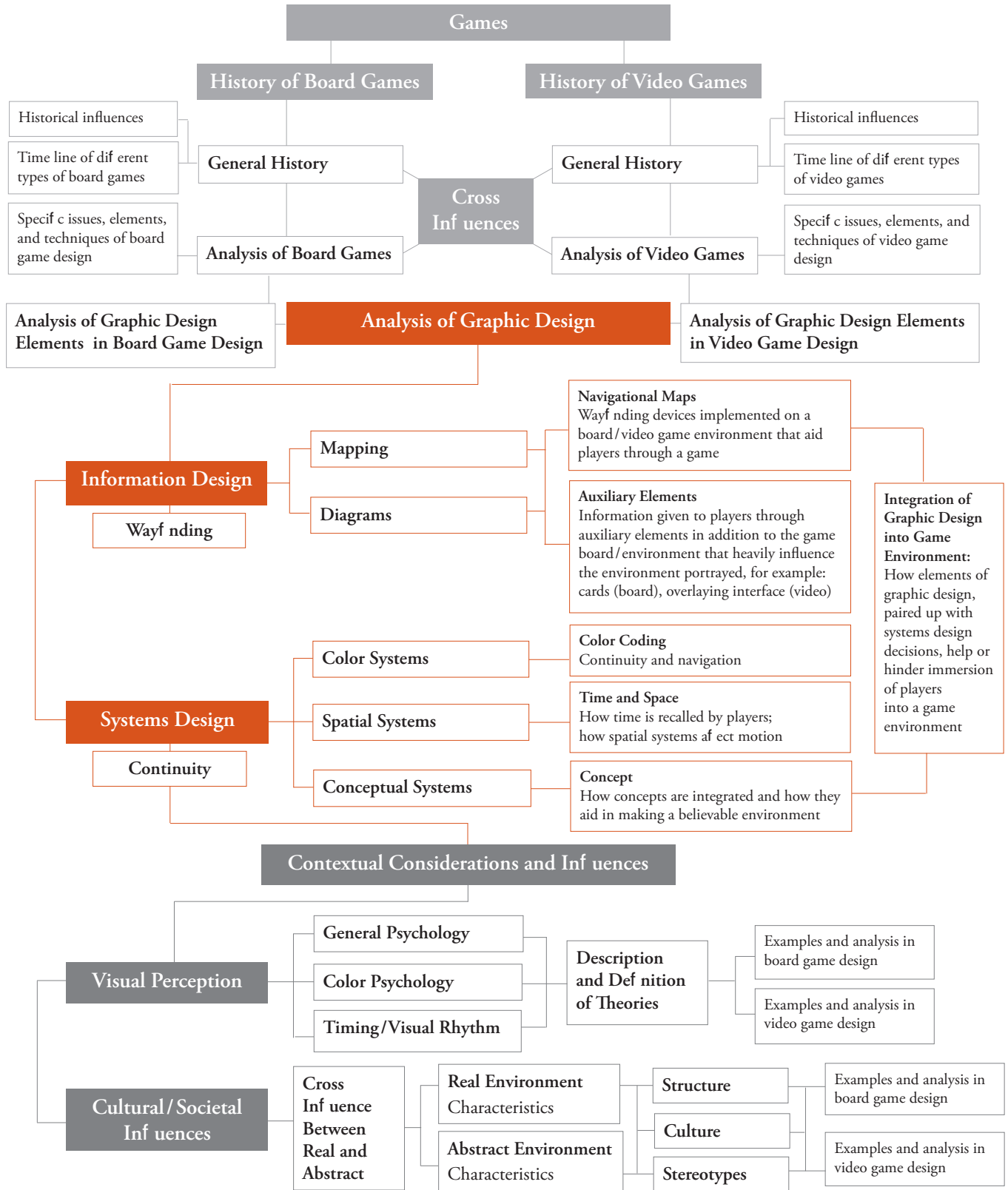Cyberspace/Cyberculture

Usability Studies
Interface Design

## Project Relevance and Importance

Just as the history of games has evolved from tangible game environments such as board games, to intangible game environments such as video games, the real world has also been constructing a crossover from real space to digital space through the Internet. Converting real businesses to online storefronts or turning archives of printed articles into online databases are two examples. Through research and analysis of how graphic design contributes to the conceptual environments in board games and video games, a further understanding of using visual means to create and navigate through new environments will be achieved. This knowledge will be useful in the transfer of environmental components from real space to digital space, as society further reinterprets the real world into new environments for digital use.

The crossover from board games to video games draws intriguing comparisons to the crossover that society is currently experiencing from the physical environment to the virtual environment. The ever-increasing awareness of the virtual environment is causing more of what once only existed in the physical environment to become re-established for use in virtual space. As society furthers this crossover, many aspects of the physical environment may become lost in the transfer from real to virtual. Because of this, it has become relevant for designers to design towards reconnecting the physical and virtual rather than designing only for one or the other. With this study of board and video games and their cross influences, graphic designers can be encouraged to seek out moments in which the physical and the virtual cross paths and create designs that serve to bridge the two rather than maintain the divide.

THESIS PROJECT DEFINITION

## Explanatory Diagram

Games

History of Board Games

Historical influences

Time line of different types of board games

General History

Specifc issues, elements, and techniques of board game design

Analysis of Board Games

Cross Infuences

History of Video Games

General History

Historical influences

Time line of different types of video games

Analysis of Video Games

Specifc issues, elements, and techniques of video game design

Analysis of Graphic Design Elements in Board Game Design

Analysis of Graphic Design

Analysis of Graphic Design Elements in Video Game Design

Information Design

Wayfnding

Mapping

Diagrams

**Navigational Maps**
Wayfnding devices implemented on a board / video game environment that aid players through a game

**Auxiliary Elements**
Information given to players through auxiliary elements in addition to the game board / environment that heavily influence the environment portrayed, for example: cards (board), overlaying interface (video)

**Integration of Graphic Design into Game Environment:**
How elements of graphic design, paired up with systems design decisions, help or hinder immersion of players into a game environment

Systems Design

Continuity

Color Systems

Spatial Systems

Conceptual Systems

**Color Coding**
Continuity and navigation

**Time and Space**
How time is recalled by players; how spatial systems affect motion

**Concept**
How concepts are integrated and how they aid in making a believable environment

Contextual Considerations and Infuences

Visual Perception

General Psychology

Color Psychology

Timing/Visual Rhythm

**Description and Defnition of Theories**

Examples and analysis in board game design

Examples and analysis in video game design

Cultural / Societal Infuences

**Cross Infuence Between Real and Abstract**

**Real Environment** Characteristics

**Abstract Environment** Characteristics

**Structure**

**Culture**

**Stereotypes**

Examples and analysis in board game design

Examples and analysis in video game design

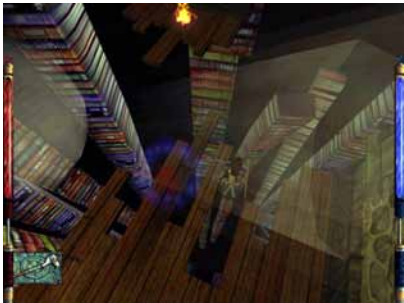# PRECEDENTS

*Researching artifacts that have influenced this research in order to define past approaches to this topic and to encourage the creation of questions that provide for a richer study*

# PRECEDENTS





**Screenshots from** *American McGee's Alice*
Rogue Entertainment, Electronic Arts

*Game Design as Narrative Architecture*
by Harry Jenkins

"The most compelling amusement park attractions build upon stories or genre traditions already well-known to visitors, allowing them to enter physically into spaces they have visited many times before in their fantasies. These attractions may either remediate a preexisting story (*Back to the Future*) or draw upon a broadly shared genre tradition (Disney's Haunted Mansion). Such works do not so much tell self-contained stories as draw upon previously existing narrative competencies. They can paint their worlds in fairly broad outlines and count on the visitor / player to do the rest. Something similar might be said of many games. *American McGee's Alice* is an original interpretation of Lewis Carroll's *Alice in Wonderland*... McGee rewrites Alice's story in large part by redesigning Alice's spaces." *Harry Jenkins*

Jenkins analyzes how new environments are created in video games by recreating already familiar spaces. His piece focuses on explaining the difference between interactive and narrative structure in games, how most games rely on narrative to create connections between player and game environment, and how those connections lead the player through the game.

Related to this thesis study, Jenkins's essay deals with studying environments created out of preexisting conventions and notions that the general public is already aware of. This ties in with seeing how new conceptual environments are made by incorporating aspects of real life in order to maintain comprehension through a common knowledge among players. This piece also speaks of how games create new experiences through "[their] creative manipulation of environmental details (Jenkins)." Although it mainly focuses on how narratives play a role in video games, it goes into detail as to how narratives are interpreted through visuals, interactive graphics, and the sequencing of visuals with respect to filmic strategies.

**Live video documentation of
Columbine Shooting**



**Jon Haddock's interpretation of Eric Harris
and Dylan Klebold at the Columbine
High School cafeteria**
Cantor Arts Center, 2004



**Jon Haddock's interpretation of "Tank Man"**
Cantor Arts Center, 2004

*Fictional Worlds, Virtual Experiences*
Exhibition at the Cantor Center for Visual Arts

"The exhibit is derived from research conducted in a Stanford Humanities Laboratory project by Lowood and other scholars, which proposes that computer games and simulations are the emerging narrative form and communication medium of the early 21st century. Housed in two small galleries and along one side of the mezzanine above the Cantor Center's main lobby, the exhibit includes a digital time line and documentary videos of gameplay that illustrate how storytelling elements like plot, character development and game settings have evolved in computer games."
*Barbara Palmer*

*Fictional Worlds, Virtual Experiences* was an exhibition on how video games create narratives through visual experiences. The exhibition included artifacts that displayed the history of video games, samples of video games for audience members to play, as well as a collection of work from Jon Haddock who has created games that reproduce real-life stories such as the Columbine shooting and "Tank Man," the anonymous person who went up against tanks during the Tiananmen Square protests of 1989. This exhibit strived to portray the growing reliance on video games as a new narrative medium for the next generation.

The exhibit is relevant to this thesis because it deals with the study of how environments are created in games and how the narratives in these games are told through a successful recreation of its intended environment. The examples at the exhibit such as the games of Jon Haddock, which reinterpret real-life incidents and environments, relate directly to studying the extent of bringing reality into a game in order to mirror a specif c environment. In this case, a real-life environment is being portrayed through another medium; it shows a visual translation of an environment that society knows of and has imagined, but has never been able to experience in time and space. Furthermore, these examples show how time and space are translated into a visual world in order to place the player directly into the environment.

It is interesting to note that such real-life scenarios, which have been ingrained into society's cultural knowledge, must be reproduced in the manner of how society originally viewed the event. Visual elements such as angles and perspectives of well-known images documenting a historical event such as the Tiananmen Square protests, are necessary to imitate in order to bring immediacy to the player and to prompt cultural memory.

# PRECEDENTS



**Inside Luxor Hotel in Las Vegas, Nevada:
an imaginary New York-themed city**
T  *e Tourist City*



**"A themed escape within an escape,"
a fantasy castle in the Magic Kingdom**
Disney World T  *e Tourist City*

## The Tourist City
Edited by Dennis Judd and Susan Fainstein

"A city that tries to build an economy based on tourism must project itself as 'a dreamscape of visual consumption.' People expect to experience heritage, architecture, and culture that make up a city's essence. A construction of any version of a city's heritage requires large doses of 'mythology, folk memory, and popular fantasy.' In resort cities like Cancun or Las Vegas, which lack a marketable historic past, a tourism infrastructure is constructed out of whole cloth. In those cities, themed environments have emerged that owe more to Disneyland and Disney World than to urban history or culture."
*Dennis Judd and Susan Fainstein*

This book contains case studies on the urban development and planning of tourist cities such as Las Vegas and Orlando (Disney World). It approaches in detail the reasons behind decisions made in developing tourist cities, and it explores the pros and cons of tourist city developments.

Case studies on tourist cities, in particular the themed environments of casinos in Las Vegas, NV, and the themed environment of Disney World residing in Orlando, FL, are relevant to this study because they depict fantasy and desire and place them into the physical environment. Places like the ones mentioned above deal with immersing imaginary environments into real life and having them interact with real surroundings and people. It is of interest to further study how the construction of the tourist city blends into its surroundings and engages its visitors. This pertains to how players are immersed into a board or video game through the design of the game's environment.

# PRECEDENTS



**Drawings for the plans of *Science City***
Chermayeff & Geismar Inc.



**Example of exhibit implemented
on sidewalk pay phone**
Chermayeff & Geismar Inc.



**Example of exhibit**
Chermayeff & Geismar Inc.

## *Science City*
Designed by Chermayeff & Geismar Inc.

"Revealing the technology and systems that make cities work, *Science City* is a collection of durable outdoor interactive displays. Telescopes help passersby locate distant antennae as well as experience live radio and television transmissions. Periscopes show the depths of water mains, subway tunnels and electrical conduit."
*Wayne Hunt,* Urban Entertainment Graphics

This is a project that was to be installed in a higher pedestrian traffic area of New York City. It turns a portion of the city into an exhibition by making props and installations out of existing city buildings and sidewalks within its true environment.

*Science City* relates to this thesis study because it is a prime example of recreating a real environment, and transforming it into a new one. Wayne Hunt states that "components are bold, brightly colored forms but have an industrial or 'real city' look." This project exemplifies the relationship between real-life environments and abstract environments. Although it is trying to create an imaginary "museum" out of the real-life city, it also wants its components to blend in with its surroundings to create a believable environment, one that is different yet recognizable by the typical passerby. This project is a physical example of combining two familiar environments, the city and the museum, to create a new environment, the *Science City*.

# RESEARCH & ANALYSIS

*Different areas of related research were studied and analyzed in terms of board and video game design. Analysis of the initial key questions posed in the introduction was completed and supported by this research.*

## Research Goals

In addition to studies involving graphic design and the design of game environments, this thesis will involve a broad range of topics including, but not limited to:

Visual Perception and Psychology
Urban Planning
Set Design in Film
Private and Public Space Design
Comics, Storyboarding and 2D Motion Studies

Visual perception and psychology were studied in order to gain a firmer grasp of how to use two-dimensional elements for clear communication.

Urban planning was researched to study urban issues and their impact on the physical environment.

Set design in film offers another angle from which to think about environments. For example, whereas urban planning reveals the design of real environments (physical), set design in film shows the design of fictional environments (virtual).

An examination of private and public space design provided a closer look at private and public information within designed environments such as board and video games.

Comics and storyboarding introduce two-dimensional sequencing and timing into this research. Similar to visual perception and psychology, comics and storyboarding provide a specific study of the connection between narratives and visuals.

The additional subjects above provide the details needed to make connections between the design of real and fictional worlds. These connections will help in identifying the visual reasons behind successful fictional environments.

The following material presents research findings of the above subtopics.

## Visual Perception and Psychology

"Subjects observing differently scaled environments undergo systematic shifts in the experience of time. The experience of temporal duration is compressed relative to the clock, in the same proportion as scale-model environments being observed are compressed relative to the full-sized environment."
Alton DeLong, "Phenomenological Space-Time"

Elapsed time ($T$) associated with experiential duration ($E$) of 30 minutes in differently scaled environments. The compression ratio (CR) is $T/E$. S.E.M., standard error of the mean

| Condition | Model scale | N | Elapsed time (min) ($X \pm$ S.E.M.) | Range | CR* |
|---|---|---|---|---|---|
| *Experiment 1 (unmasked)* | | | | | |
| Single exposure | 1/6 | 20 | $4.15 \pm 0.630$ | 1.73 to 13.83 | 1/7.23 |
|  | 1/12 | 166 | $2.52 \pm 0.170$ | 0.62 to 11.33 | 1/11.9 |
| Exposure to two | 1/12 |  | $2.64 \pm 0.133$ | 0.35 to 9.75 | 1/11.36 |
| scales (same sample) | 1/24 | 124 | $1.57 \pm 0.085$ | 0.17 to 4.92 | 1/19.10 |
| *Experiment 2 (masked)* | | | | | |
| Multiple exposures | | | | | |
| same scale | 1/6 | 11 | 1 $5.48 \pm 0.619$ | 1.00 to 8.15 | 1/5.47 |
| (independent samples) | | | 2 $5.46 \pm 0.561$ | 1.28 to 7.37 | 1/5.49 |
|  | | | 3 $5.35 \pm 0.501$ | 1.55 to 7.42 | 1/5.60 |
|  | 1/12 | 10 | 1 $2.72 \pm 0.417$ | 1.35 to 5.47 | 1/11.03 |
|  |  |  | 2 $2.43 \pm 0.453$ | 1.33 to 6.17 | 1/12.34 |
|  |  |  | 3 $2.83 \pm 0.531$ | 0.68 to 6.87 | 1/10.60 |
|  | 1/24 | 10 | 1 $1.44 \pm 0.247$ | 0.42 to 2.78 | 1/20.83 |
|  |  |  | 2 $1.56 \pm 0.312$ | 0.37 to 3.72 | 1/19.23 |
|  |  |  | 3 $1.48 \pm 0.255$ | 0.45 to 3.05 | 1/20.27 |
| Exposure to three | | | | | |
| scales | 1/6 |  | $3.85 \pm 0.357$ | 0.98 to 8.58 | 1/7.79 |
| (random order | 1/12 | 27 | $2.60 \pm 0.204$ | 0.72 to 5.55 | 1/11.54 |
| same sample) | 1/24 |  | $1.55 \pm 0.179$ | 0.25 to 3.45 | 1/19.35 |
| *Experiment 3 (masked)* | | | | | |
| Group F | | | | | |
| Single exposure | 1/12 | 23 | $2.89 \pm 0.434$ | 0.19 to 8.75 | 1/10.38 |
| Exposure to two | 1/12 |  | $2.44 \pm 0.448$ | 0.48 to 5.75 | 1/12.30 |
| scales (same sample) | 1/24 | 9 | $1.46 \pm 0.280$ | 0.20 to 3.23 | 1/20.55 |
| Group A† | | | | | |
| Single exposure | 1/12 | 32 | $8.20 \pm 0.635$ | 3.85 to 18.2 | 1/3.66 |
| Exposure to two | 1/12 | 10 | $7.36 \pm 1.167$ | 4.18 to 15.0 | 1/4.08 |
| scales (same sample) | 1/24 |  | $6.02 \pm 1.58$ | 2.78 to 18.75 | 1/4.98 |

*Theoretically CR should equal model scale [$E = x(T)$]; † Sample characterized by acoustic interference, internal auditory timing, or both.

**Alton DeLong's research data for the perception of elapsed time in scaled environments**
*(See Appendix A)*

The anthology *Directions in Person-Environment Research and Practice* deals with how people interact with environments. Many articles collected in this anthology deal with human cognition within an environment and the aesthetics of an individual's surroundings. This anthology includes the article "Phenomenological Space-Time: Towards an Experiential Relativity," written by Alton DeLong. DeLong believes that "spatial scale may be a principal mediator in the experience of time." In his article, he researches this theory and speaks of how changes in scale lead to changes in perceived duration of time, leading some of his subjects to believe that time had passed proportionally slower or faster when passing time through a scale-model environment compared to the passing of time in true environments.

Pertaining to studies related to this thesis, psychological theories such as the aforementioned play a large role in the psychology and visual perception of the participants of a game. As DeLong was proposing, the transfer of information from real-life proportions to another scale, affect not only what viewers perceive, but also the passage of time. This theory can help bring clarity to scale shifts of the graphic design in games and can aid in movement portrayed through shifts in the passing of time. The conversion of real environments into the scale of a game environment, as suggested by this essay, may occur in a proportional and measurable way. This can affect how large or small of a scale shift should occur in any given game. If a game desires specific feelings of speed or motion, the research behind this theory may bring light to how that can be done through visual means.

## Urban Development and the Needs of Society

"...it's not about the world of design, it's about the design of the world."
Bruce Mau, *Massive Change*



**Integrated mass transit system of Curitiba, Brazil**
Jaime Lerner



**Segway HT, transportation for distances too close to drive and too far to walk**
Dean Kamen

A part of urban planning deals with answering to the needs of society through environmental development, whether it be the planning of transportation means or the development of wayfnding devices. *Massive Change* is a collection of interviews with a wide range of designers, from designers of urban developments to designers of technology. These interviews reveal the efects designers have on shaping the world as they continue to design for the needs of society.

These interviews are resources because they deal with the construction of the world with respect to the needs of users, or in the case of the construction of a game, the needs of the player. Seeing how urban development and planning respond to societal needs helps bring a clearer understanding of how to answer to the needs of a game's players.

*Massive Change* includes an interview with Jaime Lerner, an urban planner for Curitiba, Brazil. Lerner speaks of how the needs of society aided him in the design of Curitiba's mass transit system. Curitiba is considered one of the best examples of urban planning to date.

Another interview in *Massive Change* is with Dean Kamen, designer of the Segway HT which provides transportation for distances that are too close to drive and too far to walk. Kamen also speaks of how society's needs have driven his designs.

Because the physical environment is what brings culture and memory to society, one must look to the construction of the existing real environment in order to build a brand new one. The development and planning that goes into designing a city should be studied in order to efectively construct any type of believable, engaging environment whether it is real or abstract.

## Set Design in Film

"...architecture sets the scene, conveying information about plot and character while contributing to the overall feel of a movie. In more discreet ways, filmmakers can use their cameras to make statements about the built – or unbuilt – environment, or use that environment to comment metaphorically on any of a variety of subjects..."
Mark Lamster, *Architecture and Film*



**House used on set design**
Mr. Blandings Builds His Dream House



**House used on various film sets**
The Spadena House, Beverly Hills, CA

Designing a fictional environment, such as the set design or architecture within a film, can provide many insights into how constructed environments borrow from actual environments in order to bring immediacy to viewers. The book *Architecture and Film* is a collection of works from writers exploring set design and its connections to architecture. This book brings together articles and organizes them into three main sections: a section on the involvement of actual architects in set design, a section on the technical and cultural aspects that go into constructing these sets, and a section on the analysis of architecture in specific films.

In particular, the article by Joseph Rosa titled "Tearing Down the House: Modern Homes in the Movies," gave an interesting look at how cultural references are built into the set of a film through architecture. Films often use architecture to create the environment they are attempting to portray. Architecture is often used as a symbol to signify a particular culture. For example, in the article mentioned above, Rosa observes that "the depiction of the traditional home became ever more entwined with notions of domestic bliss," while on the other hand, "[t]he penthouse was typically reserved for the wealthy, older, well-educated, and unsentimental (Lamster 161)." The images to the left are two examples of architecture used in films. These two houses each characterize different lifestyles and cultures.

Set design in film is the construction of a fictional environment. Both set design and game design deal with immersing the viewer in a world that he is unable to physically enter.

### Private and Public Space Design

"The quality of the interface which connects man with his machines
frequently determines the ability and the ultimate performance of the
man-machine unit... The beginning of any man-machine interface is the
objective knowledge of the full range of man's size, shape, composition
and mechanical capabilities."
William Thorton, *Human Dimension and Interior Space*

The book titled *Human Dimension and Interior Space,* by Julius Panero and
Martin Zelnik, is divided into multiple sections that deal with the analysis
and basic design standards involved in creating interior spaces specif c to
the measurements of the human body. Examples of specif c spaces studied
in this book are residential spaces, of ce spaces, mercantile spaces, eating
and drinking spaces, leisure and recreational spaces, and public spaces. This
resource provides a technical look at space construction in respect to the
proportions and needs of the human body, and of ers an intricate, detailed
look at the personalization of a space.

The design of interior spaces of ers a dif erent arena of interaction compared
to the design of exterior spaces such as architecture and urban planning.
Interior and exhibition design of ers a look into the dif erences that should be
addressed in designing the "exterior" and "interior" environment of a game:
the exterior being the construction of the environment that all players are
exposed to, and the interior being the elements of the game that belong to
each individual player alone. The design of "interior" items take on a dif erent
role, they are directed to the individual or team, not to the entire arena of
opposing players. "Interior" design of a game environment can include any
objects, clues, or information that the player obtains for his/her purposes
and not for his/her opponent's purposes. This is similar to how interior
design is for a select group – the viewers that are observing from the inside.
Because the scope of interior design is for only a select amount of people
at one time, the degree of interaction and intimacy dif ers from its exterior
counterparts such as architecture or urban planning.

## Comics, Storyboarding and the 2D Motion Studies
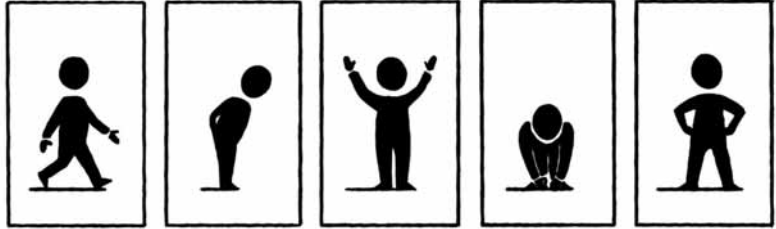


"Comic panels fracture both time and space, offering a jagged, staccato rhythm of unconnected moments. But closure allows us to connect these moments and mentally construct a continuous, unified reality."
Scott McCloud, *Understanding Comics*



**Representing linear time in a 2D sequence**
*Understanding Comics*

The book *Understanding Comics* by Scott McCloud explains why and how elements within comics influence a story and contribute toward a believable narrative. McCloud describes visual elements used in comics that aid in the visual representation of motion and time. He explains visual techniques such as elongating frames to evoke the feeling of a longer amount of time. McCloud also speaks of how visual elements can create a rhythm to prompt motion.

By studying visual narratives, one is also able to see ways in which other mediums that function in two-dimensional formats portray time and motion. For instance, in board and video games, time and motion are most often suggested as opposed to being actually physically present. The way in which games suggest time and motion is similar to how panels of a storyboard or comic book suggest time and motion.

## Key Questions

At the start of this thesis, selected key questions were posed in order to narrow down the number of varying directions the topic could take, and to provide for a focal point for exploration. Listed below, these key questions will be supported by choice examples that begin to answer each question.

As research continues, each question will be answered and organized in further detail. Here, for the purpose of introducing ideas surrounding these key questions, the examples brought up will not yet strive to take into consideration comparisons between genres and varying game platforms.

Please note that examples of games that of er customization options to the player's game interface will only be analyzed according to their default settings – settings that all players have equal access to.

1   How does graphic design help lead a player into, through, and out of an abstract environment?

2   How does systems design help players go through a game that transitions between more than one environment?

3   How are space, time, and movement generated through positioning and placement of imagery and typography?

4   What role does information design play in the depiction of virtual territory, zones, and regions?

5   How does graphic design assist in generating interaction in a game; how does it facilitate and sustain interaction?

6   How have board games influenced video games? How have video games influenced board games?

7   What types of cultural / societal symbols can be included in the design solution in order to maintain a commitment to what society already knows, while introducing them to new environments?

## Into, Through, and Out

1    *How does graphic design help lead a player into, through, and out of an abstract environment?*

This question focuses on how the integration of graphic design solutions can help ease a player into and out of the boundaries of a fctional environment.

## Entering a Game

*Animal Crossing Wild World*
Nintendo DS
Virtual Life, Role-Playing
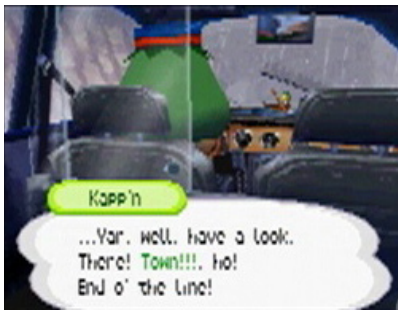


**First person point of view at introduction**



**Third person point of view throughout course of game**

*First Person Point of View*

This example uses a frst person point of view for the introduction of the game. Only at the beginning of a new game does the player experience a frst person point of view, as shown in the top screenshot on the left. This method places the player into the back seat of a car, acting as a vehicle to transport the player into the *Animal Crossing* community. Throughout the rest of the game, the perspective stays as an aerial view of the environment, as seen in the left, bottom screenshot. The addition of the frst person point of view as a device to provide the player with an entrance into the environment is a prime example of how the use of perspective can help lead a player into a game.

*The Legend of Zelda Twilight Princess*
Nintendo GameCube,  Nintendo Wii
Fantasy, Action Adventure, Role-Playing



**Panning backdrop behind title screen**

*Establish Setting*

At times, the title screen of a video game will be used to establish a setting by showing a sequence that pans across the environment the player is about to enter. The example on the left is the title screen for T e Legend of Zelda Twilight Princess. The screen includes a moving background that shows the game environment to come. This example creates a preview to the game environment, similar to the introductions of certain flms in which a shot that pans across an environment serves to familiarize the viewer with the surroundings before the story begins.

## Entering a Game (Continued)

*Tamsk*
Board Game
Racing, Strategy



**Creating a beginning through time**

### Timer / Countdown

Another way a player is introduced to a new environment is by simply starting a timer or having a countdown mechanism. Once a timer is shown, the player is given a clear signal of when gameplay will begin. This helps transfer a player immediately into the arena of a game through the competitive and aggressive nature that measured time can produce in this context. The game on the left, *Tamsk*, uses a series of hourglasses as game pieces. The beginning of the game is marked by turning over each game piece in order to establish the start time.

## Through a Game

*Gears of War*
Xbox 360
Shooter, Sci-Fi



**Establishing f rst person perspective**

### Maintaining First Person Perspective

Maintaining f rst person perspective of the player through a heads-up display (HUD) interface keeps the player connected to his / her role as the main character while traveling throughout a game. On the left is an example from *Gears of War*, which preserves the f rst person perspective of the player's character by displaying the interface in a way that places the player behind his / her equipment and gear.

*Metro*
Board Game
Racing, Puzzle



**Marking goals of the player**

### Demarcating Start and End

Making the beginning and ending of a game clearly visible gives the player both start and end goals. In this example on the left, *Metro* color codes the start and end goals for each player; blue to blue for one player, and yellow to yellow for another. The color coded game pieces and game board help the player strategize a route through the game.

## Exiting a Game

*Animal Crossing Wild World*
Nintendo DS
Virtual Life, Role-Playing



*Conceptual System*

Exiting a game has sometimes incorporated a conceptual system. Again, we take a look at *Animal Crossing*, seen here on the left. In order to exit out of the *Animal Crossing* world and end the game, the player can go back to his/her bed and go to sleep. At the start of a saved game the player's character will awaken from their bedroom to once again place the character into the context of the game. This relates to the real world and how we exit our physical world through sleep, and enter it again by waking up.

**Exiting a world through sleep**

*Lumines I/II*
Sony PlayStation Portable (PSP)
Puzzle, Strategy



*Visual Boundaries*

Another way of exiting a game can be seen in puzzle games such as *Lumines*. Seen here on the left, there are clear boundaries to indicate where the gameplay occurs (within the grid area). As bricks stack up, they get closer and closer to the top edge of the grid or "game board." Once these bricks hit the top line and exit the boundaries, gameplay has ended. Anytime the player is outside of the boundary they have "exited" the game.

**Creating visual boundaries for the player**

### Transitions Between Environments

2  *How does systems design help players go through a game that transitions between more than one environment?*

This question looks into how a player travels in and out of environments within a single game.

---

*Contact*
Nintendo DS
Role-Playing





**Using the main character as a constant variable throughout different environments within one game**

*Constant Variable*

Maintaining certain constants through all varying environments within a game helps the player transition more easily between abstract spaces. The game on the left, *Contact*, involves travel between two worlds. *Contact* maintains the design of the main character that the player plays (seen in bottom right corner of the top screen, and the middle of the bottom screen) as a constant variable for the player to connect to. Even when the player crosses over to the other world, shown to be different by varied line weights and style, the stylistic choices and design of the main character stay the same throughout.

---

*Super Mario Bros.*
Nintendo Consoles
2D Platformer



**Containing the player within the environment at all times**

*Containment of Player*

Containing the player in some sort of "vehicle" as he or she transports within the game environment can help transitions by never allowing the player to visually or conceptually exit the environment. For example, in the *Super Mario Bros.* series, if the player ever needs to be transported from one place to another, it is done by jumping into green pipes and "warping" to get from one place to another. The consistent use of green water pipes as a symbol of transport, helps keep the player within the game environment at all times.

## Space, Time, and Movement

3  *How are space, time, and movement generated through positioning and placement of imagery and typography?*

The examples for this question focus on the visual generation of space, time and movement within a game. It does not focus on actual space, time or movement generated, but how visual elements are used to create the perception of these three items.

## Space

---

*Zertz*
Board game
Strategy



**Adding and subtracting from a space**

*Addition and Subtraction of Components*

One way of transforming space can be as simple as adding or subtracting from the actual game board. The game *Zertz* is played on a board that keeps shrinking until the player has nowhere to go. The boundaries that this constantly changing game board graphically portrays with its modular game pieces, keeps the player aware of the spaces that are being generated and regenerated throughout gameplay. This game indicates space by creating a graphic textural difference between the game board and the surface that the game board rests on. The game also enhances the idea of space by constantly expanding and shrinking the game board.

---

*World of Warcraft*
PC / Mac
Fantasy, Massive Multiplayer Online
Role-Playing Game (MMORPG)



**Signaling proximity through the appearance of text above objects**

*Actions Prompted by Proximity*

In the example to the left, *World of Warcraft* places text above objects, labeling them with information necessary to the player such as the object's name and level in the game. This system of tagging objects is activated once a main character is within a specific distance from the object. It produces its own measurement of space for the environment that the player must adapt to. For instance, one might guess by looking at the scale relationship between the character and rabbit on the left, that the distance between them appears to be one inch; however because of the difference in scale and differences between virtual space versus physical space, the actual distance between the two remains unidentifiable by standard units of measurement. Instead, a conceptual measurement of space is created through graphic details such as text appearing above an object when the player reaches a specific proximity to the object.

**RESEARCH & ANALYSIS**

Time

---

*Monopoly*
Board game
Territory, Strategy



*Creating Associations Through Distance*

*Monopoly* is an example of how distance can affect perceptions of time. The game is set up so that the farther away a space or property is, the more value it has. This structure produces associations between time and value. In *Monopoly*, items of higher cost are farthest away from the starting point. By combining an increase in value with an increase in distance, the game design creates its own measurement of time. This measurement of time adds to the overall environment of the game because it separates game time from real time.

---

*Bully*
Sony PlayStation 2
Virtual Life, Action Adventure



*Animal Crossing Wild World*
Nintendo DS
Virtual Life, Role-Playing



*Physical Time Devices*

Here are two examples of video games that use the placement of a clock within the game in order to give the player a sense of time.

*Bully*, on the top, is not a game that is played in real time. In this game the clock is used as a time device in another way; it appears every time the character has a task to complete within a time limit. The clock not only lets the player know it is time to perform a task, but also provides the player with a time frame.

In *Animal Crossing,* the clock plays a different role. *Animal Crossing* is a game played in real time, and the clock icon for this game only appears when the player is at a standstill. It differs from the representation of time in *Bully*, which is communicating time spent. In *Bully* the clock is there to represent a countdown for when the player must complete his/her task. However, the clock in *Animal Crossing* represents the forward movement of time. Passing time is made evident by having a clock appear on the screen every time the player pauses or stops to think. The clock in *Bully* represents time spent while in *Animal Crossing* it represents time wasted.

Movement

*Sorry*
Board game
Territory, Racing

**Maintaining a consistent interval
of game space**

*Consistent Intervals of Game Spaces*

Many games produce their own measurement system by employing consistent intervals of space. This gives the player a constant to compare to – a block of space, versus two blocks of space, versus three blocks of space, and so on. An example of this is the game *Sorry*, pictured on the left. In order to create larger movements across the board the game groups together existing intervals of space, as opposed to bringing in a new size of space. This is represented by the colored bars that begin with a triangle and end with a circle. The sliding area gives players the ability to move over 5 spaces at once rather than going one-by-one. This produces varying speeds in the mind of the player: a "walking" speed when traveling from square to square, and a faster speed when sliding across more than one interval of space in one move.

*Lumines I / II*
Sony PlayStation Portable (PSP)
Puzzle, Strategy
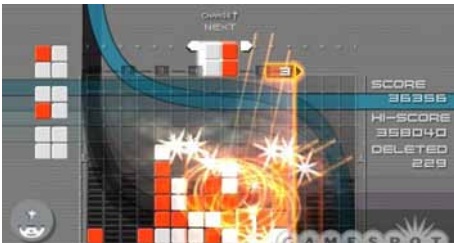
**Creating movement across a screen**

*Creating a Visual Rhythm and Tempo*

The way movement is represented in *Lumines* is through a running *timeline*. *Timeline* is the name that has been given to the yellow vertical line seen in the screenshot on the left. The running *timeline* is a vertical line that runs across the screen at varied speeds according to the pace of the music that is playing. This *timeline* creates a visual representation of tempo. As it moves across the entire visual f eld at varied speeds, it slows down and speeds up the player's mentality. This is reflected in a player's movements as the player slows down and speeds up to the tempo of the *timeline*.

## Territory, Zones, and Regions

4   *What role does information design play in the depiction of virtual territory,
zones, and regions?*

This question deals with the way a game organizes its information
and displays it to the player.

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*Acquire*
Board game
Territory, Strategy
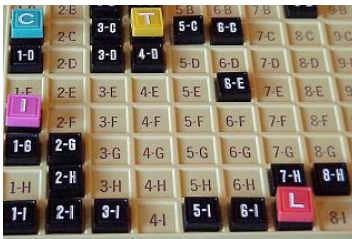


*Go*
Board game
Territory, Strategy
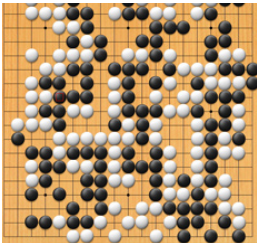


*Color Coding*

Color coding is a simple way to create boundaries between zones or regions.
The examples to the left, *Acquire* (top) and *Go* (bottom), use color coding
as ways for players to mark their territories. Each of these board games uses
color coding to depict territorial ownership. Color coding in both examples
provides each player with a map of the territories and regions belonging to
them. This creates visual boundaries of the areas and zones belonging to each
player. Both game boards, along with their respective game pieces, can be seen
as an interactive map of a space or environment built by its players.

---

*Super Mario Bros.*
Nintendo Consoles
2D Platformer



**Signifying checkpoints throughout the
game with icons familiar to the player**

*Use of Icons / Symbols*

The use of icons or symbols can signify certain types of territories or zones.
A flag can serve as a symbol for more marking or even conquering a territory.
In all versions of *Super Mario Bros.*, the flag symbol is used in order to denote
the passing of a certain checkpoint or to mark the defeat of one world or
territory. This approach acts as a marker for the player and separates the linear
game environment into zones, separating areas that the player has already been
to, apart from zones the player still has to conquer.

## Generating Interaction

5   *How does graphic design assist in generating interaction in a game;
how does it facilitate and sustain interaction?*

This key question pertains to ways in which a game compels players to take
action or lead them further into the game environment.

---

*Ca$h n' Gun$*
Board game
Role-Playing



**Directly speaking to the players
through role-playing**

*First Person Point of View*

A game can affect interaction by creating a first person point of view for the
player. First person point of view places players in the shoes of the actual
characters being portrayed in the game. This builds a game where direct
communication between players is necessary, thus generating interactivity.
In the board game *Ca$h n' Gun$*, pieces of the game become accessories that
create characters out of the players themselves. Simplified visual props, such as
the silhouette of a gun, prompt the player to undertake a specific role among
other players of the game.

---

*Order of the Stick*
Card Game
Role-Playing
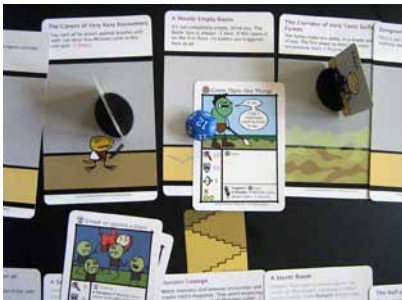


**Environment customized through
player interaction**

*Player - Generated Environments*

Another way to generate interaction is by creating a game environment that is
built by the players themselves. On the left is the card game *Order of the Stick*.
The environment for this game is generated entirely by the cards each player
chooses to contribute to the environment and its narrative. A player-generated
environment produces a game with an unlimited number of possibilities.
Players must work together to keep the game going, while also competing
against each other to win the game. Interaction is driven by the fact that the
game's narrative and environment are both dependent on decisions made by
the players.

---

*The Legend of Zelda Twilight Princess*
Nintendo GameCube, Nintendo Wii
Fantasy, Action Adventure, Role-Playing



**Mapping out player controls to serve
as a quick reference**

*Interactive Instruction*

Many video games include a diagram of the player's control pad in the user
interface. This shows the player which buttons perform what tasks. The tasks
of each button often change as the character runs into different situations.
By placing this instructional diagram on the screen, it makes it easier for the
player to interact with each situation he or she may encounter. The example to
the left, T e Legend of Zelda Twilight Princess, displays its player controls at the
upper right corner of the screen.

## Influences and Cross Influences

6   *How have board games influenced video games?*
*How have video games influenced board games?*

This question focuses on further understanding the ties between board games and video games and how one category has influenced the other in space, movement, and interactivity.

## Influence of Board Games on Video Games

*LCD Game Format*



*Super Mario Bros.*
Nintendo Consoles
2D Platformer





**Linear movement across an environment**

### Contained Environment

Many of the earlier video games were contained within one image of an environment, just as board games often are. For example, early versions of video games such as LCD games (left) feature one stagnant environment in the background. All movements in LCD games were movements made by the character or player, across a still image. Board games are similar: the still image served as the environment for the game while the character or player moved across the board or "image." LCD games are an early predecessor of the three-dimensionality that video games are capable of today. The example to the left shows the background as a virtual perception of three-dimensionality through its use of perspective.

### Linear Movement

Early forms of video games also mirrored the linear movement common in board games. An example of this is *Super Mario Bros.*, where the player always moves from left to right across the screen. Board games often include prescribed linear movements across environments that are interjected by various options and obstacles. This can also be said for early 2D platformer video games such as *Super Mario Bros.*, which also move in a linear fashion with obstacles along the way. One difference, however, is that winning in an earlier board game that used linear movement was most often influenced by chance, whereas the linear movement across early video game environments was often affected by skill and choices made by the player. For example, in T*e Game of Life* (page 36), the player has little control over who will win the game as the movements across the board are determined by spinning a wheel to generate a random number that tells the player how many spaces he may move. In comparison, the video game *Super Mario Bros.* (left) relies on the skill of the player to navigate successfully across the screen.

## Influence of Video Games on Board Games

*Order of the Stick*
Card Game
Role-Playing
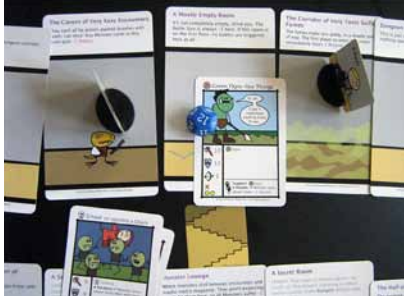


**Nonlinear narrative through an interactive environment**

### Nonlinear Narrative

The influence of video games can be seen in the increase in nonlinear narrative and heightened interactivity in board games of today. The narrative for *Order of the Stick*, as well as its environment, are generated by players' decisions. The advent of video games brought to board games a new form of interactivity among the players – the ability to interact with the environment itself. Instead of the previous static, contained environments of past board games, as mentioned on page 25, board games are now also discovering ways in which an environment can respond to a player. This is similar to video game environments where the environment is affected by movements made by the player.

*Monopoly The Card Game*
Card Game
Territory, Strategy



### Inclusive of Physical Environment

In recent years, popular board games such as *Monopoly* and *Clue* have created card game representations of the original board games. These card games get away from the contained, preestablished environment, and instead, allow the physical surroundings around the game to serve as the "game board." By taking away the actual game board, card games interact with surrounding context. The card game version takes the game out of the environment it once existed in, and allows it to be in either a physical or mental environment as determined by its players. By taking into account the surrounding context, these card games are able to break away from their contained environments and create a wider range of surroundings through players' imaginations.

*Clue The Card Game*
Card Game
Role-Playing, Mystery

Cross Influences Between Board Games and Video Games

*Lost Cities*
Board Game
Territory, Strategy



*World of Warcraft*
PC / Mac
Fantasy, Massive Multiplayer Online
Role-Playing Game (MMORPG)



*Separation of Individual from Public Information*

Auxiliary items such as individual player cards in the board game *Lost Cities* (top) draw interesting comparisons to the auxiliary items included in the interface of the video game *World of Warcraft* (bottom). Board games and video games each have separate spaces in which they contain private and public information. Both games are similar in the way that they provide a private space that is visible only to each individual player and not to the public environment. Both formats of gaming involve a separate space for each individual player to hide personal information from other players.

The way in which players interact with one another in a board game compared to a video game also differs. The board game potentially includes players' facial features and expressions that play a large role in the game whether or not they are intended to. However, in the video game environment, all expressions are masked by a virtual character and represented through textual description and computer-generated facial expressions. This difference contributes to the amount of private and public information that each type of game can offer.

## Cultural and Societal Influences

7   *What types of cultural / societal symbols can be included in the design solution in order to maintain a commitment to what society already knows, while introducing them to new environments?*

This question investigates fctional environments that were produced by integrating details from the real world.

---

**Chess**
Board Game
Territory, Strategy



**The abstraction of a warring battlefeld**

### Preexisting Environments

One way of including cultural symbols is by modeling the game environment after a preexisting environment, fctional or nonfctional, and then abstracting or embellishing it. A simple example is *Chess,* which serves as an abstract version of a warring battlefeld. By modifying a familiar environment rather than creating a brand new one, a game can bring preestablished knowledge and emotions to the game's narrative.

---

**Cityscape**
Board Game
Territory, Strategy



**A portrayal of a city skyline**

### Architectural / Landscape Symbols

Another way to incorporate cultural symbols is through the addition of notable icons from architecture or the natural environment. The board game *Cityscape* is an example of abstracting a city skyline and using that type of environment as the premise for a game. The rectangular high and low forms that are created by the architecture of a city skyline are abstracted in *Cityscape* to the point where they are simply square blocks stacked one on top of the other. However, although they are so abstracted that they take on a simple basic geometry, the game depends on the well-known architectural symbol of rows of tall buildings in order to create the environment for this game.

---

**Okami**
Sony PlayStation 2
Fantasy, Action Adventure



**Japanese brush painting style**

### Style Association

The game *Okami* uses the painterly style of Japanese brush paintings to establish the environment of this game which tells tales of historical myths and legends. This brush painting style is consistent throughout the game, and creates an strong association to Japanese history, art and culture.

# SYNTHESIS

*Organizing artifacts and theories from research using structures such as matrices and area comparisons to compare and contrast information in a way that is most beneficial to this study*

## Categorizing Types of Games

It is important to categorize games in order to understand the context of each game. To that end, a comparative matrix that provides a visual overview of different game categories was generated. The varying types of games are differentiated by the players' end goals for each game. For example, according to this matrix, *Chess* is a "Strategy by Placement or Displacement" game. This is because the purpose and goal of the player is to create disorder to his/her opponent's strategy by blocking his/her pieces or taking over spaces. Included here is an excerpt from the comparative matrix. The set of games highlighted here were chosen for their heightened, more evident comparisons.

The complete matrix can be seen on the following page along with descriptions of its categories.

| | | Puzzle | Racing | Space or Territory | Chasing and Cornering | Strategy by Placement | Role Playing | Good Example of: Motion | Space | Time |
|---|---|---|---|---|---|---|---|---|---|---|
| Board Game | Clue | ● | ● | | | | ● | ● | ● | ● |
| | Cityscape | | | ● | | ● | | | ● | |
| | Go | | | ● | ● | | | | ● | |
| | Chess | | | | | ● | | ● | ● | ● |
| | Ca$h n' Gun$ | | | | | | ● | | ● | ● |
| Video Game | Brain Age | ● | | | | | | | | ● |
| | Animal Crossing | | | ● | | | ● | ● | ● | ● |
| | Civilization Series | | | ● | | | ● | | ● | |
| | Contact | | | | ● | | ● | ● | ● | ● |
| | Final Fantasy Series | | | | ● | | ● | ● | ● | ● |

## Categorizing Types of Games

| | | Puzzle | Racing | Space or Territory | Chasing and Cornering | Strategy by Placement | Role Playing | Good Example of: Motion | Space | Time |
|---|---|---|---|---|---|---|---|---|---|---|
| Board Game | Clue | ● | ● | | | | ● | ● | ● | ● |
| | Metro | ● | | | | ● | | ● | ● | |
| | Life (The Game of) | | ● | | | | | ● | ● | ● |
| | Tamsk | | ● | ● | ● | | | ● | | ● |
| | Cityscape | | | ● | | ● | | | ● | |
| | Go | | | ● | ● | | | | ● | |
| | Monopoly | | | ● | | ● | ● | ● | ● | ● |
| | Order of the Stick | | | ● | | ● | ● | ● | ● | ● |
| | Zertz | | | | ● | ● | | ● | ● | |
| | Chess | | | | | ● | | ● | ● | ● |
| | Ca$h n' Gun$ | | | | | | ● | | ● | ● |
| Video Game | Brain Age | ● | | | | | | | | ● |
| | Mario Kart | | ● | | | | ● | ● | ● | ● |
| | Animal Crossing | | | ● | | | ● | ● | ● | ● |
| | Civilization Series | | | ● | | | ● | | ● | |
| | Legible City | | | ● | | | | ● | ● | |
| | Pac-Man | | | ● | | | | ● | ● | ● |
| | Second Life | | | ● | | | ● | ● | ● | ● |
| | Contact | | | | ● | | ● | ● | ● | ● |
| | Final Fantasy Series | | | | ● | | ● | ● | ● | ● |
| | ARQuake | | | | ● | | ● | ● | ● | ● |
| | Tetris | ● | | | | ● | | | ● | ● |
| | World of Warcraft | | | | ● | | ● | ● | ● | ● |
| | Shadow of the Colossus | | | | | ● | ● | ● | | |
| | Zelda Series | | | | | ● | ● | ● | ● | ● |
| | Sims, The | | | | | | ● | ● | ● | ● |

## Categorizing Types of Games

The following pages include detailed def nitions of the types of games included in the horizontal axis of the comparative matrix shown on page 30.

| Categories | Goal of Game |
|---|---|
| Puzzle | To solve problems through strategy |
| Racing | To f nish before opponent |
| Space or Territory | To obtain as much territory as possible |
| Chasing and Cornering | To chase or corner opponent |
| Strategy by Placement | To place oneself strategically to advance |
| Role Playing | To take on the role of a character |

| Categories | Summary |
|---|---|
| Motion | Portrayal of movement in 2D and virtual formats |
| Space | Representation of space in 2D and virtual formats |
| Time | Depiction of time in 2D and virtual formats |

## Categorizing Types of Games
*Category Definitions*

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### Puzzle



*Metro*
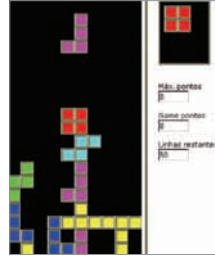


*Tetris*

A puzzle game is a board or video game that involves solving a complex problem through various forms of experimentation. Solving puzzles is sometimes the entire goal of a game, or is included intermittently throughout a game.

A good example of a puzzle board game is *Metro*, in which the player must decide or determine which pieces will lead one metro across to the other side. An example of a puzzle video game is *Tetris*, a game in which the player must consolidate blocks in order to decrease the rising number of blocks.

---

### Racing Game



*Clue*



*Mario Kart*

A racing game involves any type of board or video game where the goal is to finish before one's opponent.

One example of a racing board game is *Clue*. In *Clue,* players compete to gain enough clues to guess the name of a murderer and solve a mystery before their opponents do. An example of a video racing game is *Mario Kart* (Nintendo game console) where players race cars against each other and winners are those who finish first.

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### Space and Territory
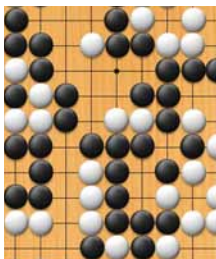


*Go*



*Civilization (IV)*

Space and territory games are those in which the end goal is to obtain as much space or territory as one can in order to "conquer" more territory than one's opponent.

An example of a territory board game is the game *Go*, in which players use black and white tiles to demarcate their territory and surround their opponent. An example of a territory video game is *Civilization.* Not only does the player "take over" pieces of land, but he also builds upon the environment in order to succeed in the game.

### Chasing and Cornering



*Tamsk*



*Super Mario Bros.*

The goal of this type of game is to chase or corner one's opponent. Chasing and cornering may seem similar to racing because oftentimes chasing games are also a race to the finish. However, they differ in the way that chasing games are not simply a race to the finish, but a race to distract and prevent opposing players or characters from advancing further than the player himself.

An example of a chasing board game is *Tamsk*. This game involves cornering an opponent and trapping them in spaces to prevent opposing players from crossing to the other side of the board. A video game example is *Super Mario Bros.* where the player chases and attempts to defeat his / her opposing character throughout the entire game.

### Strategy by Placement



*Chess*



*Legend of Zelda: Link to the Past*

This type of game prompts the player to place himself in strategic areas to advance in the game while at the same time attempting to move the opponent farther away from the target or end goal.

An example of a strategy-based board game is *Chess*. In *Chess* the player advances his / her own pieces and tries to create disorder in the opponent's strategy by blocking pieces or taking over occupied spaces. Strategy by placement is rarely the only strategic component of a video game. An example of a strategy by placement game is *Tetris*, also seen on page 32 in *Puzzle*. A video game that includes strategy by placement within its overall schema, is *Legend of Zelda: Link to the Past*. In this game there are instances where the player must obtain an item and place it in the correct area in order to advance.

*Monopoly*            *The Sims*

**Role Playing**

In this matrix, role playing should not be confused with an "RPG" or Role Playing Game (see *Glossary*). This category includes games that require the player to "physically" take on the role of another character through accessory items that fabricate an alternate character. In the case of video games, physically taking on the role of another character entails a *virtual* character.

An example of a board game that involves role playing is *Monopoly*. In *Monopoly* the player must act as a real estate tycoon. Auxiliary items such as money and real estate deeds help concoct each character. An example of a role playing video game is Τ e Sims. Although the role playing involves virtual means in Τ e Sims, customization of a player through clothing, hairstyle and facial features all add to the role playing experience.

**Motion, Space and Time**

After comparing this collection of board and video games by type of game (see pages 32-34), each specif c example was then characterized as benef cial illustrations of motion, space, or time. These three categories are some of the most important aspects of this study. This matrix enabled selection of examples according to each game characteristic such as type of game, and whether motion, space or time is interpreted successfully. With this section of the matrix, one can see visual comparisons between each game's level of importance as it pertains to motion, space and time.

In order to clearly explain the categories of motion, space, and time, one game that serves as a good example for all three categories was chosen. The descriptions of motion, space, and time on the following page, use the familiar board game T e *Game of Life* as an example. T e *Game of Life* is used here specif cally because the game deals with a translation of real life events (nonf ctional) into a two-dimensional environment (f ctional), which is a large part of this thesis exploration.

## Motion



**Cars driving on the timeline of life,
a metaphor representing motion
in *The Game of Life***

Motion can be represented visually in a board or video game in many different ways. One example is portraying motion through visual representation of other objects that imply motion. For example, The Game of Life uses a metaphor that places the timeline of an entire lifetime onto the board in the form of a road. A character's life is passed by driving along the curved road. The player "drives" with a visual representation of a vehicle, the game piece. Although motion is not physically present, it is provoked through the player's connection to the car on a road and the idea of motion or travel.

## Space



**A space defined by a set of icons and
color-coded spaces in *The Game of Life***

The space of a game involves the game's ability to confine the player within the borders of its environment. Many aspects factor in to the creation of space within a game such as the use of metaphor noted above which provides a hypothetical situation and space for a player to enter into. More specific examples from The Game of Life can be seen in its use of color and icons. The symbols used connote different types of occurrences that the player may stumble upon throughout the course of the game. This allows the player to visually clue in on the type of space he or she has landed on. The set of symbols specific to the game also represent a characteristic environment or space. Wayfinding devices employing color and icons aid in the creation of a space that immerses players into an environment similar to the real world, where one that uses wayfinding devices such as icons and color-coding as well. However, wayfinding devices can also bring players into a new environment with a newly defined space through newly defined icons and strategies for color-coding.

## Time



**Time is portrayed in *The Game of Life* through
spaces corresponding to moments in a lifetime**

Time is portrayed visually in the two-dimensional space of The Game of Life through the use of consistent areas of space that represent the idea of a "timed" sequence of events. Characteristics of time include consistency and continuity. The consistency of a specific amount of area per space, provides regularity and continuity representative of society's association with time. Another part of the game that adds to this kind of time allotment is the wheel the players must spin in order to move across the board. The number that is spun on the wheel directly relates to the number of spaces to advance. These spaces represent moments in time that the player will advance.

### Categorizing Types of Games

The information and analysis provided by the comparative matrix on page 30 were used to compile a list of ways that the games can be ordered to be most helpful to this study. This is known as Richard Saul Wurman's Organizing Hatracks, in which collections are organized by category, time, location, alphabet or magnitude. This approach toward organization was used by Wurman to demonstrate the impact organization can have on communication.

Seen below are examples of ways to organize characteristics of board and video games by location, time, and magnitude.

| *What each arrangement has to offer* | *Examples of Arrangements* |
|---|---|
| The interaction of games with surrounding environment(s) | *By Location*<br>Place where game is / can be played (from online, to indoor, to outdoor, etc.) |
| The degree of abstraction of a game environment compared to its level of location | Location of game environment from the ground to the sky |
| Together, these two ways of organizing data show connections between the time period a game is trying to portray, compared to the time period it was produced in | *By Time*<br>Earliest to latest time period game portrays<br><br>Earliest to latest time period game was popularized |
| This aids in further studies between complexity of games incorporating less environments versus more | *By Magnitude*<br>Lowest to largest number of environments included in game |
| How small / large conceptual spaces are interpreted given the same amount of real space | Most enclosed space to most vast area covered within game |

**SYNTHESIS**

## Environments of Cinematic Set Design

A comparative matrix was used in order to visually compare different environments as they appear in films and to provide a preliminary organizational structure for examples that are relevant to this study. Films that offered a wide range of combinations between fictional and nonfictional environments were chosen as possible examples to explore.

Below is an excerpt of this organizational structure. By studying the first four columns of this matrix, one can easily identify *Fight Club* and *Dr. Strangelove* as examples of set design that place fictional concepts into nonfictional environments. Following the first four columns other factors are indicated. Although all of the films may contain some of the characteristics being compared to some degree, the ones marked are thought to be prime examples of each characteristic as it specifically relates to set design.

The complete matrix can be seen on the following page along with descriptions of its categories.

| | Fictional Concept | Nonfictional Concept | Fictional Environment | Nonfictional Environment | Multiple Environment Styles | Systematic Color Palette | Linear Path Through Environment | Scale Shifts | Exaggeration of Elements | Change in Orientation |
|---|---|---|---|---|---|---|---|---|---|---|
| *Alice* | ● | | ● | | ● | ● | ● | ● | ● | ● |
| *Brazil* | | ● | ● | | | | | | ● | ● |
| *Being John Malkovich* | ● | | ● | | ● | | | ● | ● | ● |
| *Berlin* | ● | | ● | | ● | | | ● | ● | ● |
| *Batman* | ● | | ● | | | ● | | ● | ● | ● |
| *City of Lost Children* | ● | | ● | | | ● | | ● | ● | ● |
| *Blade Runner* | ● | | ● | | | | | ● | ● | ● |
| *Amelie* | | ● | ● | | ● | ● | | | ● | ● |
| *Fight Cub* | ● | | | ● | ● | | | | | |
| *Dr. Strangelove* | ● | | | ● | | | | ● | ● | ● |

## Environments of Cinematic Set Design

| | Fictional Concept | Nonfictional Concept | Fictional Environment | Nonfictional Environment | Multiple Environment Styles | Systematic Color Palette | Linear Path Through Environment | Scale Shifts | Exaggeration of Elements | Change in Orientation |
|---|---|---|---|---|---|---|---|---|---|---|
| Alice | ● | | ● | | ● | ● | ● | ● | ● | ● |
| MirrorMask | ● | | ● | | ● | ● | ● | ● | ● | ● |
| Time Bandits | ● | | ● | | ● | | | ● | ● | ● |
| The Adventures of Baron Munchausen | ● | | | ● | ● | ● | | ● | ● | ● |
| The Piano Tuner of Earthquakes | ● | | | ● | ● | ● | | ● | ● | ● |
| Willy Wonka & The Chocolate Factory | ● | | | ● | ● | | ● | ● | ● | ● |
| The Wizard of Oz | ● | | | ● | ● | | ● | ● | ● | ● |
| Being John Malkovich | ● | | | ● | ● | | | ● | ● | ● |
| Brazil | ● | | | ● | ● | | | ● | ● | ● |
| Eternal Sunshine of the Spotless Mind | ● | | | ● | ● | | | ● | ● | ● |
| Sleeper | ● | | | ● | ● | | | ● | ● | ● |
| Batman | ● | | | ● | | ● | | ● | ● | ● |
| City of Lost Children | ● | | | ● | | ● | | ● | ● | ● |
| Blade Runner | ● | | | ● | | | | ● | ● | ● |
| Metropolis | ● | | | ● | | | | ● | ● | ● |
| Fight Club | ● | | | ● | ● | | | | | |
| Dr. Strangelove | ● | | | ● | | | | ● | ● | ● |
| Sliding Doors | ● | | | ● | | | | | | ● |
| Tango | | ● | ● | | ● | ● | | | | |
| Berlin | | ● | ● | | | | | | ● | ● |
| Amelie | | ● | | ● | ● | ● | | | ● | ● |
| Playtime | | ● | | ● | ● | | | ● | ● | |
| Saddest Music in the World | | ● | | ● | | | | ● | | |
| Last Year at Marienbad | | ● | | ● | ● | | | | ● | |
| Run Lola Run | | ● | | | ● | | ● | | | |

### Environments of Cinematic Design

The following pages include detailed definitions of the categories from the comparative matrix on page 39.

| Categories | Definition |
| --- | --- |
| Fictional Environment | Fabricated setting |
| Nonfictional Environment | Real-life setting |
| | |
| Fictional Concept | Fabricated idea / story |
| Nonfictional Concept | Real-life idea / story |

| Categories | Connections to Game Design |
| --- | --- |
| Multiple Environment Styles | Transitioning between environments |
| Systematic Color Palette | Containing the player |
| Linear Path Through Environment | Revealing information |
| Scale Shifts | Signaling an abstract environment |
| Exaggeration of Elements | Manipulating old vs. creating new |
| Change in Orientation | Incorporating society's visual memory |

## Environments of Cinematic Set Design
*Category Definitions*

The first four categories of this matrix deal with comparing and contrasting the relationship a film creates between the environment it depicts and the concept that "lives" in that environment. For the purpose of defining these first four categories, the set designs of *Wizard of Oz, Batman*, and *Run Lola Run* will be used as examples.

### Environments: Fictional and Nonfictional

**Fictional Environment**



*The Wizard of Oz*
Directed by Victor Fleming

**Fictional and Nonfictional Environment**



*Batman*
Directed by Tim Burton

**Nonfictional Environment**



*Run Lola Run*
Directed by Tom Tykwer

Rarely does a film attempting to portray a fictional environment completely leave behind elements of the real world. Because fictional and nonfictional environments often overlap in film environments, a film may be positioned *between* the categories of "Fictional Environments" and "Nonfictional Environments" in the organizing matrix (see page 39). The main difference between a fictional and nonfictional environment is whether or not the film uses the real environment to tell the story, or whether a fictional environment is created. A film that is marked as having both fictional and nonfictional environments is one that embellishes upon a nonfictional, real environment in order to produce a fictional one.

An example of a purely fictional environment is The Wizard of Oz. Although this film draws its influences from real city environments as well (as in the Emerald City), it is intended by the creator that the Emerald City and all other environments in The Wizard of Oz are figments of the imagination.

Other films such as *Batman* may appear to take place in an entirely fictional environment because of its concept. However, *Batman* has been categorized as a combination of a fictional and a nonfictional environment. This is because the environment of *Batman* is a fictional city (Gotham City) that is combined with a real metropolitan city (New York City) in order to create its environment – Gotham City is the equivalent of New York City in the story of *Batman*.

An example of a nonfictional environment appears in *Run Lola Run*. This film is set in a German town, and no attempts to combine reality with abstraction are made.

**SYNTHESIS**

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**Concepts: Fictional and Nonfictional**

Looking at each film in terms of whether they include a fictional or nonfictional environment, and then comparing them to the actual concept of the film, leads to discoveries in cross influences of real and fictional environments. In addition, studying a film's environment adds to the research of cultural and societal impacts on the design of constructed spaces.

The examples below place the prior set design examples used alongside each film's concept. This shows the different combinations one can obtain from such a matrix. The main factor in distinguishing a fictional concept from a nonfictional one is whether or not the concept can occur in real life.

*Environment*

**Fictional**



*Concept*

**Fictional**



The Wizard of Oz

This film combines a fictional environment with a fictional concept. This can be used to study the degree to which real world influences are brought into fictional, abstract environments in order to bring immediacy to its audience, as well as research dealing with the strategies that are used to bring real world elements into a fictional concept.

**Fictional and Nonfictional**



**Fictional**



*Batman*

This film incorporates a mixed fictional and nonfictional environment with a fictional concept. This can be useful for studies dealing with the manipulation of the real world in order to represent a fictional concept.

**Nonfictional**



**Fictional**



*Run Lola Run*

The concept of *Run Lola Run* deals with the rewinding of time to see changes that could have happened in the past. This film combines a nonfictional environment with a fictional concept. This combination is important to seeing the ways in which a nonfictional environment works towards adding to and characterizing a fictional concept.

## Environments of Cinematic Set Design (Continued)

The last six categories in the matrix on page 39 compare different elements that the films have used in order to accomplish their fictional or nonfictional environments. Descriptions along with examples of these six categories follow.

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### Multiple Environment Styles

This element deals with multiple environments that may exist within one film's concept. Multiple environments can offer insight to changes in the design of multiple environments within one larger environment.

To the left is an example from *Being John Malkovich*. Comparisons between the example to the left, can be made with the example of this same film on the following page (see *Scale Shifts*). These examples show that there is more than one type of environment: the outside world (a nonfictional environment) and the inside, or office environment (a fictional environment).

*Being John Malkovich*
Directed by Spike Jonze

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### Systematic Color Palette

The systematic use of a color palette provides continuity throughout a film and creates bridges between varying environments in a film. Using systems design towards the selection and use of color allows an audience to become engaged in the environment and keeps the audience from breaking away from the fictional environment created.

An example of a set that uses a systematic color palette is the film *Tango*. It consistently uses a combination of greens, yellows, and reds so that no matter what type of environment *Tango* poses, the audience is still aware that they are in the same overarching setting.

*Tango*
Directed by Carlos Saura

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### Linear Path Through Environment

It is important to differentiate films that have environments that are traveled through linearly, compared to an environment that relies more on revisiting and experiencing the same location. Environments that are introduced in a linear fashion reveal information differently from environments introduced nonlinearly. For example, information can be revealed in a different order by putting more importance on certain objects or clues through placement, orientation, and color.

This image is from the mixed media film *Alice*. The tale of *Alice* follows a linear path in which Alice enters into different environments once she gains enough knowledge or travels far enough to get there.

*Alice*
Directed by Jan Svankmajer

SYNTHESIS

### Scale Shifts



***Being John Malkovich***
Directed by Spike Jonze

Multiple scale shifts can be used to indicate a difference between the real world and an abstract world. By changing an environment through scale shifts, the new environment created has the ability to retain many or all familiar aspects of the real environment while only changing the scale relationships.

The example to the left taken from the film *Being John Malkovich*, shows the set design of the film's office environment. All details of a typical office building elevator are retained but scale relationships have been changed in order to call attention to a new environment.

### Exaggeration of Elements



***Playtime***
Directed by Jacques Tati

Similar to how scale shifts often reflect society's preexisting knowledge, exaggeration is another element that is used to depict a fictional environment. Exaggeration does this by manipulating something society is already familiar with. This creates a bridge for viewers to cross from unknown surroundings to known surroundings.

An example of exaggeration appears on the left. This is an image from the film *Playtime*. *Playtime* portrays the monotony of the modern office environment and exaggerates the uniformity of an industrial world.

### Change in Orientation



***Eternal Sunshine of the Spotless Mind***
Directed by Michel Gondry
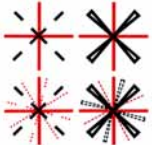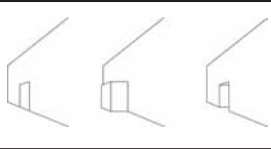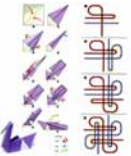
Change in orientation is another way to transform something from everyday life into something that belongs in another world. Differing from scale shifts, a change in orientation deals specifically with displacing a familiar object. An example of a change in orientation that signals a fictional or abstract environment is a book or chair floating in the air. This type of change not only displaces something familiar to us, but calls upon the viewer's prior knowledge and logic. When one sees a book floating in space, it leads one to believe that the space the book resides in defies theories of gravity that are relevant in the real world. The viewer may then conclude that the environment they are viewing or experiencing is fictional.

To the left is an example from the film *Eternal Sunshine of the Spotless Mind*. This example shows the two characters of the film bathing; however, instead of a bathtub or swimming pool, the characters are displaced in a kitchen sink. By changing the objects inside the sink, the film has changed the environment of the film into a fictional one – an environment where abnormal circumstances are able to occur.

S Y N T H E S I S

### Relevancy of Information Design and Visual Perception
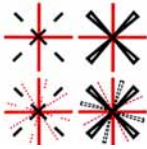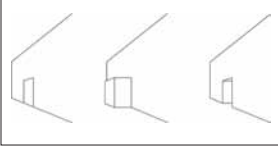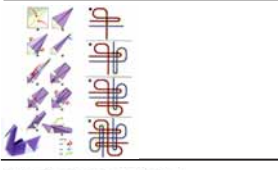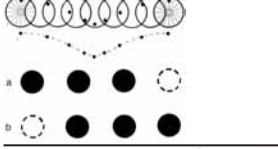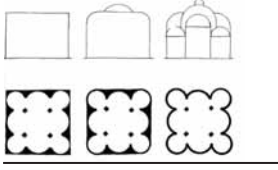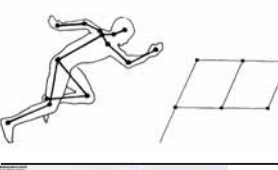
Visual perception is an important factor in designing a game environment. One example is that games deal with perceived motion within an environment more so than actual physical movement. Visual perception studies include many diagrams and drawings that help explain how viewers perceive motion and the progression of time through order, placement, and perspective of imagery in a two-dimensional space. Organizing visual perception through a comparative matrix can help clarify which theories of visual perception pertain to which specif c arena of elements included in a game environment. As is demonstrated below, this comparative matrix denotes important aspects of each information design example that helps present information successfully to its viewers.

The complete matrix can be seen on the following page along with descriptions of its categories.

| | Icon and Symbol Design | Information Design | Implied Movement | Time Progression | Information Dissemination |
|---|---|---|---|---|---|
|  | | | ● | ● | |
|  | | ● | | ● | ● |
|  | | | ● | | ● |
|  | | | | | ● |

### Relevancy of Information Design and Visual Perception
Larger images appear in *Appendix A* on page *A2*.

| | | Icon and Symbol Design | Information Design | Implied Movement | Time Progression | Information Dissemination |
|---|---|---|---|---|---|---|
| 1 |  | | | ● | ● | |
| 2 |  | | ● | | ● | ● |
| 3 |  | | | ● | | ● |
| 4 |  | | | | | ● |
| 5 |  | | | ● | ● | ● |
| 6 |  | ● | ● | ● | | |
| 7 |  | | | ● | | |
| 8 |  | ● | | ● | | ● |

**SYNTHESIS**

### Relevancy of Information Design and Visual Perception

The following pages include detailed descriptions of the categories present in the comparative matrix on page 46.

| *Categories* | *Purpose in Game Design* |
| --- | --- |
| *Icon and Symbol Design* | Wayﬁnding |
| *Information Design* | Navigation |
| *Implied Movement* | Virtual Space |
| *Time Progression* | Distance |
| *Information Dissemination* | Private and Public Data |

SYNTHESIS

## Relevancy of Information Design and Visual Perception
*Category Descriptions*

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### Generating Icons and Symbols

Items in this category are ones that would be beneficial to studies related to generating icons or symbols within game design that are necessary for wayfinding and navigation.
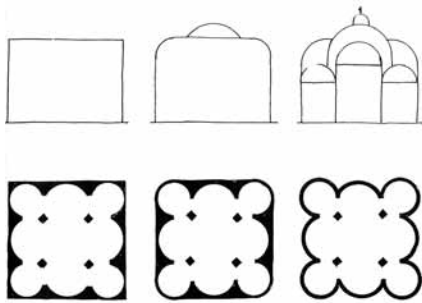
Take for example the diagram to the left. It shows how the shape of a building can serve as an idea for generating a symbol that is related to the building itself. The shape of the exterior of this building reveals the shape of its interior as well. It can serve as a symbol for the building, and at the same time reveal some specific information about the building. This goal is useful in generating symbols and icons that have more meaning than simply fitting into the visual attributes of a system. For game design this can mean implementing a systematic symbol set that can be used to add clues or information throughout a game that do not deviate from the specific feel of its designed space.

*Wayfinding: People, Signs, and Architecture*
Paul Arthur, Romedi Passini

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### Map Design

This section includes information design examples that relate to navigation. Artifacts in this category are ones that not only provide a map for navigational use, but also incorporate different ways to integrate clues and information helpful to the player as they actually use the map for travel.
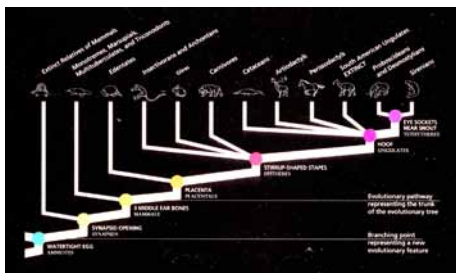
For example, the map to the left relates to locations within an exhibit on evolution. The map is designed in a way that it also serves as an evolution time line. Maps that contain additional information through meaningful layering can enhance the setting of a game environment.

*Information Architects*
Ralph Applebaum

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### Physical Movement

This category is for diagrams that exhibit ways to visually depict movement. Many diagrams are good examples of how to portray the idea of motion in a two-dimensional format.
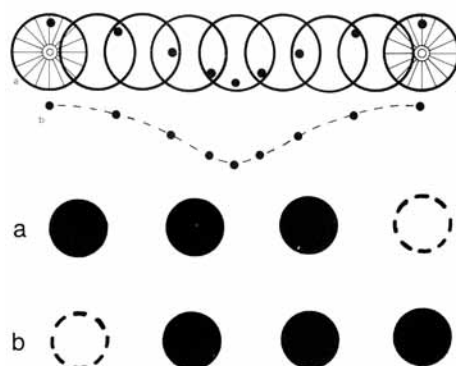
The example to the left diagrams how one visually perceives motion. The top diagram shows the rotating motion of a wheel without the wheel itself. These types of diagrams rely on visual psychology and help create the idea of motion in a game, without providing actual, physical motion. The bottom row (b) only portrays movement alongside "a." With "a," "b" reads as three black dots that have moved to the right. Without "a," "b" would simply be read as one outlined dot and three black dots, with no movement implied.

*Principles of Visual Perception*
Carolyn Bloomer

### Relevancy of Information Design and Visual Perception
*Category Descriptions (Continued)*

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**Time Progression**
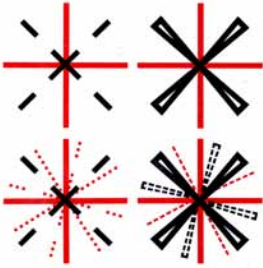


*The Interpretation of Visual Motion*
Shimon Ullman

Visuals can be used in particular ways to imply the concept of time passing. This is similar in some respects to the visual communication of motion. This category however deals strictly with concepts related to time such as progression, continuity, and consistency. To the left is an example of a design that appears on the cover of *The Interpretation of Visual Motion*. This visual shows a constant symbol (a red plus symbol), with progression achieved through additions made to the original symbol. Just by the addition of elements to one original constant, the visual perception of progression can be produced.

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**Information Dissemination**
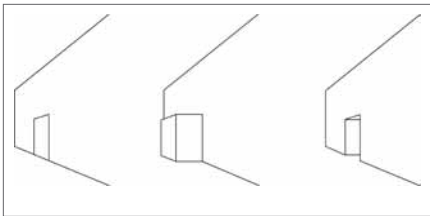


*Wayfinding: People, Signs, and Architecture*
Paul Arthur, Romedi Passini

There are many factors involved in presenting information to a player of a game. The sequence in which the information appears is important, as well as its placement within its environment. This category includes diagrams and images that may be useful in presenting information throughout a game. As a player travels through a game environment, the information they find along the way must be clear.

The diagram to the left is a visual perception diagram that shows different approaches in architecture that help to clearly depict an entrance for wayfinding purposes. This diagram shows three different depictions of entrances. It would be beneficial to study what these visuals offer in regards to successfully presenting a visual entrance in a two-dimensional setting. Studying visual perception diagrams such as this improves ways of designing visual wayfinding cues for players of a game.

SYNTHESIS

### The Graphic Design of Game Components

Presenting an abstract environment to a viewer involves a balance of attention paid to the narrative of the game, the navigational system it adopts, how it disperses information to the viewer, and how well-developed the characters are. When dealing with these four traits of a game, it was necessary to understand the degree to which graphic design affects each aspect.

The two area comparisons below represent to what extent each of the four aforementioned game components affect the graphic design of character traits and the graphic design of a map or interface of a game.

By studying the individual parts of a game that require graphic design one can see which considerations are more important than others when designing certain parts of a game. More focused, beneficial design decisions can be derived from pinpointing the main impacts on the formulation of character traits or maps / interfaces.

The two area comparisons appear with expanded explanations on the following pages.

**Influence of Graphic Design on Character Traits**

Narrative

Navigation

Dissemination of Information

Character Development
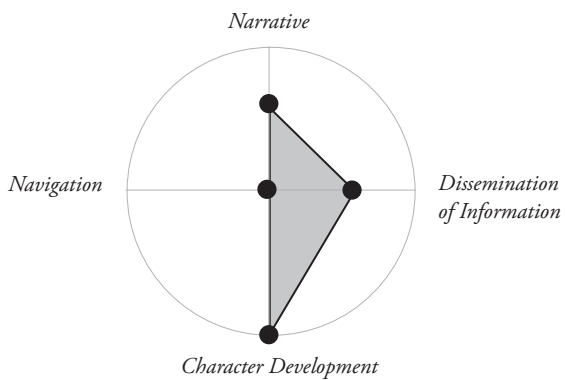
**Influence of Graphic Design on Wayfinding**

Narrative

Navigation

Dissemination of Information

Character Development
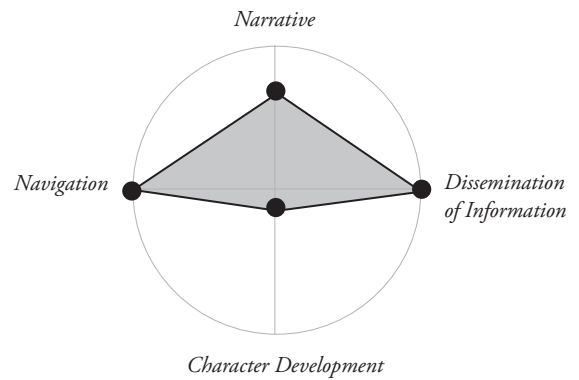
## The Graphic Design of Game Components

**Inf uence of Graphic Design on Character Traits**

The f rst area comparison presents the design of visual elements that help characterize roles of players in a game. Role playing influences the immersion of a player into a game environment and is helpful in carrying someone over from reality into f ction.

Out of the four areas being compared, the graphic design of character traits af ects character development the most. Character traits also af ect the dissemination of information in a game because characteristics of each player are often taken into consideration when information is being disseminated to players. For example, specif c information may be presented to one character and not another depending on the character's traits. Also somewhat af ected is the narrative of a game. Some games carry several narratives that will change its course according to the type of character that is being played.

*Narrative*

*Navigation*

*Dissemination of Information*

*Character Development*

## The Graphic Design of Game Components

**Inf uence of Graphic Design on Wayf nding**

This second area comparison focuses on information design that can be seen in game environments. Objects like maps or diagrams that are included in the interface of a game, are important assets to a player journeying through a f ctional environment.

Out of the four areas being compared, the graphic design of maps and interfaces af ects navigation and the dissemination of information the most. Maps and other informational tools within a game provide the player with instructions on how to navigate through a new environment. The design of the interface of a game provides the player with organized information in order to help the player easily and quickly access information when it is needed. The design of maps and interfaces af ects narrative to some extent as well because a map or interface can provide information that supplements a game's narrative. For example, some maps are stylized through the use of systematic color or imagery in order to blend further with the time period of the narrative.



*Narrative*

*Navigation*

*Dissemination of Information*

*Character Development*
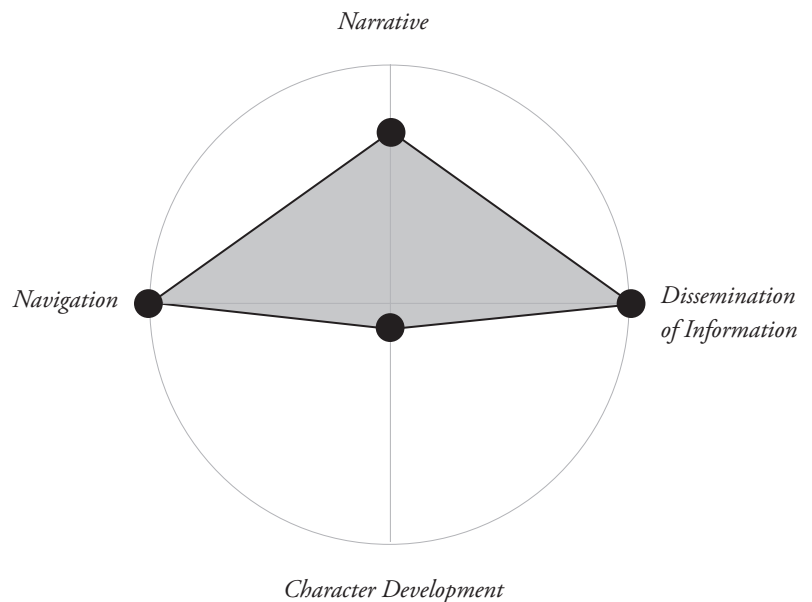
# IDEATION

*The process and exploration of defining a design application that not only employs the research and analysis completed in this thesis but also generates a range of concepts and directions for consideration*

**IDEATION**

## Application Definition Process

The following is a documentation of topics, relationships, and concepts that have contributed to the final design application for this thesis study. Different ideas and possibilities for an application that would connect well with this thesis study were taken into consideration. These varying directions served to help define the final application project. The following pages describe each initial concept (prior to the final application proposal) in the original order they were conceived.

### Initial Concepts : Stage 1

Brainstorming potential applications was necessary to f nd the most benef cial project to address the questions this thesis study proposes to answer.

### Potential Application A

*Design Project*

Design of a set of game environments, or "playgrounds," that exist in specif c locations within the real, physical environment.

*Description*

This potential application will include the design and possible installation of an abstract environment within an existing physical environment – creating a new environment out of an old one. Maintaining a balance between the new environment and the old one would be one of the main focal points of this application.

*Relevancy*

The application relates to this thesis because it will attempt to create an abstract environment and use graphic design elements to guide a player, demonstrating ways in which graphic design can direct a player through gameplay. This application will further graphic design studies dealing with wayf nding and information design and their contributions to the enhancement of the pedestrian experience. Furthermore, it may of er possibilities of new environmental graphic design solutions for city development that could be used towards cultural promotion and tourism.

*Main Considerations*

Selecting the location and surrounding environment with respect to the concept of the game

Integrating the game into an already existing environment and creating a new environment that is separate but within the real environment

Transporting players of the game from one area to another area where transitional devices are necessary from one point to the next (i.e. if the game were to take place in various parts of a city, how would the player successfully travel from one "board" to the next?)

Displaying private and public information

Integrating rules throughout gameplay as opposed to providing separate instruction

## Potential Application B

*Design Project*

Redesigning existing board games into physical installations that would exist within the real, physical environment.

*Description*

This potential application involves research regarding visual versus physical interpretations of movement, space, and time. It would create prototypes for life-size versions of existing board games. The research done for this thesis concerning scale shifts and their af ect on movement, space, and time created in board games will be used to create this project.

*Relevancy*

Dealing with visual perception, this application would aid the future direction the graphic design industry may take in terms taking into consideration the change in scale from physical to virtual environments and vice versa.

*Main Considerations*

Selecting the location and surrounding environment with respect to the concept of the game

Displaying private and public information

Comparing physical and virtual representations of movement, space, and time

Installing and evaluating the same board game in more than one physical space

**IDEATION**

Potential Application C

| | |
|---|---|
| *Design Project* | Prototype for environmental graphic design that coexists with the technology of augmented reality; a technology that is currently being developed through devices that overlay a digital interface onto physical space. For visual examples of augmented reality, please see *A3* of *Appendix A*. |
| *Description* | The technology of augmented reality has included experimentation involving video games, as well as more practical areas such as navigational and medical devices. This project would include designing a prototype for a system of wayfinding signage and a computer graphics interface that works together successfully on the same platform. This potential application deals with the challenge of creating a new abstract environment out of a physical and digital interface. |
| *Relevancy* | Whether it be as simple as a navigational device for a pedestrian or as complex as a medical device helping a doctor navigate through a surgery, this technology deals with new electronic devices that could benefit from graphic design decisions. This application would further studies of possible directions that the graphic design industry may take in the future. |
| *Main Considerations* | Integrating physical signage and digital overlay of information graphics |
| | Incorporating cross influences between physical wayfinding signage and augmented reality wayfinding |
| | Combining two separate, existing environments into one new environment |
| | Displaying private and public information |

**IDEATION**

### Further Developments: Stage 2

After the previous initial concepts were proposed, they were further developed into the following three potential applications:

*Reinterpreting Spaces Through Mapping*
*Experimental Walking Guide*
*Collaborative Construction*

### Reinterpreting Spaces Through Mapping

| | |
|---|---|
| *Application* | Designing 2D maps with influences from 3D maps through layering and an examination of different ways to integrate and separate information |
| *Goals* | Taking one space and reinterpreting it several ways through a series of maps that highlight different paths, and evaluating changes in emotions participants may experience when traveling with the maps |
| *Considerations* | Researching and implementing cross-influences between concepts of physical mapping / wayfinding and virtual mapping / wayfinding |
| | Directing experiences through graphic design (different paths that participants are influenced to travel through the use of different maps, will bring a distinctive collection of experiences to each viewer of the space) |
| | Creating maps that act as a layer of information, "overlaying" concepts and influences upon specific physical spaces |
| | Using information design to construct or transform an environment |
| | Devising a new environment through the graphic design of maps rather than creating maps for an existing environment |

## Experiential Walking Guide

*Application*   Creating an experiential walking guide in the form of a physical handheld wayfinding device that guides a person through a space using information design and the concepts of time, space, and motion as it pertains to gaming

*Goal*   Reinforcing the ability of design to transform environments and spaces, and creating a fictional environment from an already familiar, physical space by using wayfinding and information design to change or influence the emotions, feelings, and thoughts a person has about a specific physical space

*Considerations*   Using information design and wayfinding to impose a specific perception onto an environment that already contains certain associations

Selecting a specific physical space that people are already familiar with (i.e., library or college campus)

Forming different paths throughout the space and building different influences and experiences into its users

Evaluating a test group's navigation through the space

Implementing further transformations as individual input is recorded

## Collaborative Construction

| | |
|---|---|
| *Application* | Building a physical environment collaboratively from a "blank slate" by using graphic design to encourage exploration, instead of to control direction, thus highlighting the role graphic design plays in communicating story, structure and atmosphere of a fctional environment |
| *Goal* | Taking into consideration the surroundings and space to be used and selecting a group of subjects to begin plans for a simple game; every few days graphic design elements and auxiliary items that encourage and contribute to gameplay will be added into the environment in order to study the effects that graphic design has on the development and design of the game and its environment |
| *Considerations* | Changing an empty playground into an interpretation of the space |
| | Using design elements to further communicate ideas of the selected space to the general public |
| | Selecting surroundings and spaces with specifc attributes that beneft the project's end goal |
| | Using graphic design to encourage and provoke thought rather than control thought |

*Possible locations for this particular project appear on the following pages.*

## Collaborative Construction (Continued)

Potential sites for this application within the city of Rochester were documented for future reference.

| *Attributes* | *Site* |
|---|---|
| | *South Avenue and Alexander Street* |

Symmetrical and consistent structures that can be used for timing, sequencing, and spacing

Open space with minimal outside influences

Pillars can be used for displaying information



*Rochester Museum and Science Center (RMSC) Herb Garden*

Contained area with obvious boundaries

Popular location may provide higher amount of participation

Preerected, multi-directional paths



*Maplewood Rose Gardens*

Split between open "blank" space and developed space

Popular location may provide higher amount of participation

Side-by-side proximity of two different spaces for easy comparison

Collaborative Construction (Continued)

| Attributes | Site |
|---|---|
| | *Lyell Avenue (commercial)* |

Clear frames/windows enable changing background for environment

Walls create an outdoor space as opposed to an indoor space



---

*Lyell Avenue (residential)*

Clear open space with only simple markers for boundaries

Markers have a wide range of use because of high degree of abstraction

Access to more than one space that are similar to this one, providing for good comparisons during experimentation

### Final Application

All previous application concepts led to this f nal application, which relates most closely to the goals of this thesis study. The following application shows how influences from game design can inspire ideas on the potential of graphic design to improve and enhance daily life.

### Problem Statement

The cross influences found in traveling through physical environments (board games) and virtual environments (video games) can play a major influence on the current state of digital mapping or digital cartography. Another way the physical and the virtual cross paths (such as in board and video games) is the way in which the physical world is currently being mapped in a digital space. One example is web-based driving directions and mapping as seen in *Google Maps* or *Mapquest*.

*Google Maps* or *Mapquest* is an area in which physical and virtual worlds meet. In order to get to a physical space by way of digital cartography, one follows directions on a virtual representation of that space where one is removed from the actual activity of travel. Once these directions are transferred to the physical world, such as through printed driving directions, virtual and physical spaces collide. Internet driving directions may seem to of er a customized version of a path through a physical space, but it is also distilling physical space to the point where it ignores actual space. This causes the person to only focus on the destination through a series of directions that *tells* someone where to go, but fails to *show* them.

Even though a person is in the space they are navigating, their awareness of that space is subdued because they have been put into a perspective in which the path is prescribed by abstractions. One example of this is compressing an entire path into a single street name. People rarely travel through the internet by actually typing in web addresses, but rather, they are more likely to be linked to sites through search engines, other sites, or other people. In addition, people travel through virtual space by seeing images or symbols, not by reading pieces of text. This can also be said for traveling through physical spaces. For example, people often navigate by way of visual symbols such as architecture, formal and informal landmarks, and signage icons.

**IDEATION**

## Proposal

The creation of a web-based driving direction application geared towards heightened physical experience rather than efficiency could potentially provide both seasoned and new residents of communities with new insights into their physical surroundings.

Walking and driving each offer different viewpoints of a city and provide visitors with varying degrees of physical space awareness. However, with today's digital culture comes the desire for speed and efficiency. This desire affects the way society travels through space, particularly with vehicular travel, as people increasingly rely on internet driving directions and GPS systems to relay the fastest and most efficient turn-by-turn directions. By focusing on getting from point A to point B, society has become more involved with their destination rather than the path they are traveling. This decrease in attention paid towards the process of travel can be seen as a reduction in the experience.

In order to enhance existing physical environments, the application for this thesis attempts to bring in influences from board and video games to design a new system for internet driving directions. In games, the experiences and paths one takes are just as important as the final destination itself.

## Goals

The goal of this application is to use graphic design to enhance surrounding physical environments and to counteract the cultural push towards the reduction of experience in exchange for easily transmittable data. This will be done by attempting to make users / participants aware of their physical environment by redesigning current internet mapping formats such as driving directions provided by *Google Maps* or *Mapquest*.

The redesign will attempt to place the traveler in a state of enhanced awareness of his / her environment by highlighting certain landmarks or points of interest. This turns the focus towards the physical environment rather than just its labels (i.e., street signage), bringing a heightened level of customization to internet driving directions.

The prototypical layout for driving directions will take influences from board and video games, incorporating the ways in which they represent environments in physical and virtual form. Employing a balance of influences from both board and video game environments will benefit this application, which deals with aspects of crossing between physical and virtual spaces. As the world becomes more engaged and contained within virtual environments, a respect for the physical environment could be renewed by encouraging a heightened awareness of actual surroundings and attributes through an individual's driving experience.

## Production Plan

An overview of the plan that this design application will take appears below. Expanded details on the design ideation of this application appear on the following pages. Further details on the intermediate evaluation mentioned below are included in the *Intermediate Evaluation* section of this thesis documentation (page 82).

| | |
|---|---|
| *Design* | *Two prototypical layouts will be created by the designer to test against one control (A) driving direction set, as well as to test against each other* |

| | |
|---|---|
| A | *Google Maps* driving directions |
| B | Layout with the goal of being efficient with elements that heighten experience |
| C | Layout with the direct goal of creating a heightened experience |

*Prototypical layouts will be designed to fit a mock scenario for students*

| | |
|---|---|
| Scenario | Student is meeting friends at RIT's Gallery r for the afternoon, and then going to the Bug Jar for a concert |
| Route | RIT → Gallery r → Bug Jar |
| | Bug Jar → Gallery r → RIT |

| | |
|---|---|
| *Intermediate Evaluation* | *Students will be polled to become a part of the testing pool for evaluating the functionality as well as the value of having access to such a travel tool. The following two groups will be established:* |

| | |
|---|---|
| Group 1 | Familiar with the Rochester area |
| Group 2 | Unfamiliar with the Rochester area |

## Initial Design Stage

Initial approaches for the layout of this project are shown on the following pages. They appear in the natural order that they were designed in, to provide the reader with a look at the different stages of process the designer went through to reach the final design solutions.

Many underlying influences from board and video game design can be seen throughout the prototypical designs. In order to provide readers with a focal point, a list is compiled below showing the key influences that were implemented in the initial stages of design planning. For specific descriptions of each influence, please refer to *Key Questions* on pages 15-28.

*Board Games*
Linearity
Movement pushed through intervals of space
Delineating start and end points to help subject travel through "space"
Representation of movement and timing

*Video Games*
Layering of information
Private vs. public information
First-person point-of-view
Boundaries of "gameplay"

**Key Design Elements**

**Key Game Elements**

Boundaries of
"gameplay" are set
with a visual cue of
beginning and end

Hierarchy of information:
the most important
information appears larger
in order to be beneficial to
the user as well as show a
simplified set of rules that
rely on left and right turns
(the basis of driving)

Curved rule acts as a
symbol for a "corner,"
placement of imagery
on "corner" implies
intersection or turn

Visual movement is
created by producing an
alternating rhythm with
the symbols/content

Limited symbols used
to enhance deviations
from a schema (i.e.
system of circular
symbols (into, through,
out), deviations occur
when square prompts
an action needed by
the driver

Time and distance
traveled are placed
side by side in order to
provide connections to
a visual representation
of time

Vertical rule acts as a
timeline; this projects
the perception of
passing time as viewers
relate this form of
layout to timelines

First person point-of-
view is activated with a
visual symbol of a car's
dashboard transferring
the reader into the
perspective and role
of the driver

I D E A T I O N

Initial Design 1
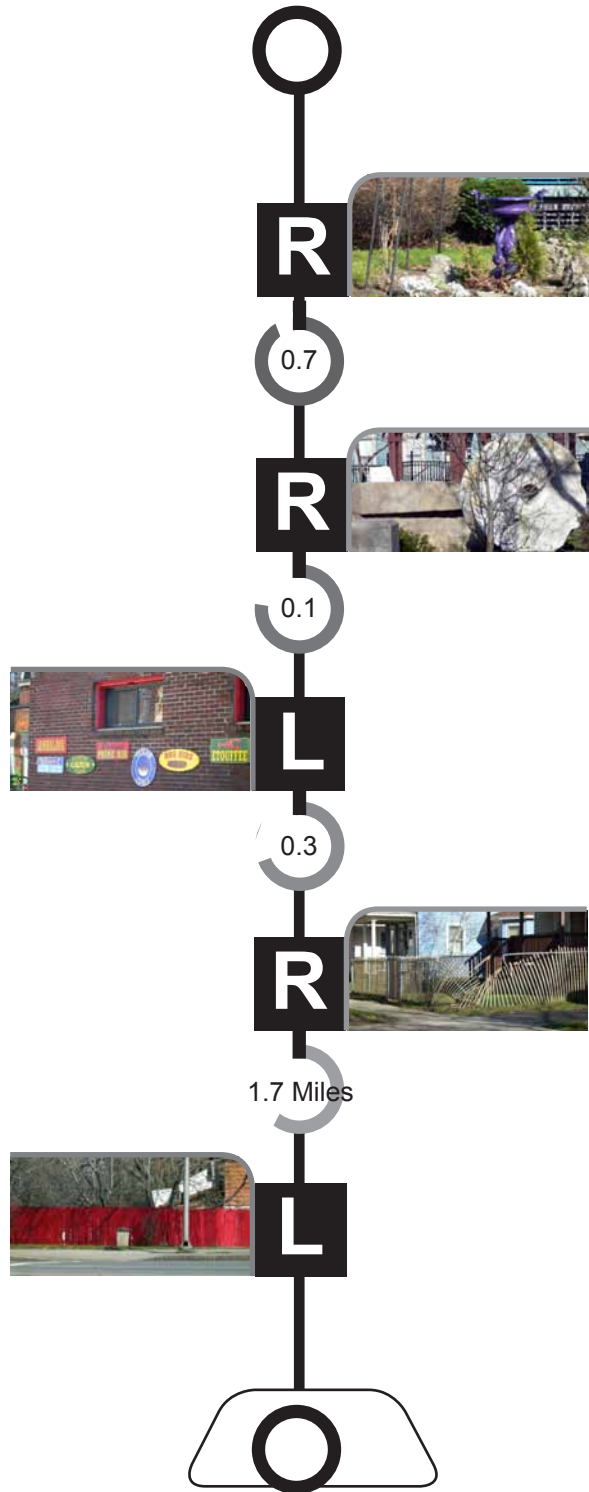
**Key Design Elements**

**Key Game Elements**

Imagery presented in
an elongated linear
manner mirroring the
horizontal way people
and their vehicles
travel; this enhances
the sense of motion as
it mirrors the driver's
own motion

Placement of imagery
to match the direction
of travel (i.e. right turn
placed on right side
of vertical axis) allows
the viewer to visually
see, even from afar, the
number, order,
and/or turns they
will need to make

Each turn treated
as individual,
linear motions
(i.e. 1. Drive 1.7 miles
   2. Find/View the image
   3. Make a left turn

Entering the experience
through a conceptual
system of opening and
closing doors, which is
a symbol of entrance

IDEATION

Initial Design 2
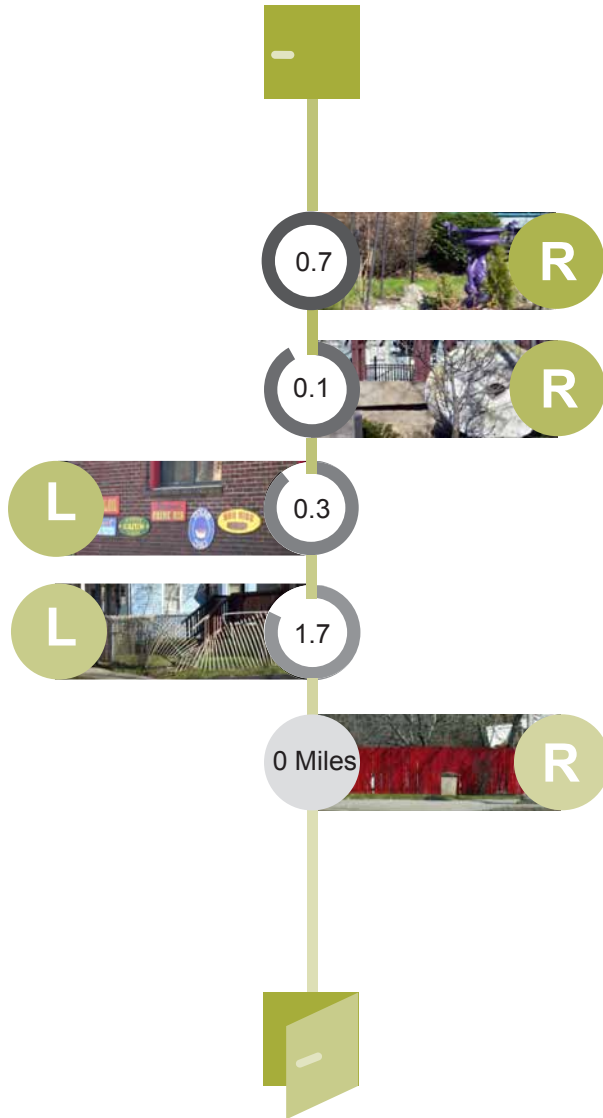
**Key Design Elements**

**Key Game Elements**

Vertical arrow symbol
to direct viewer to read
from bottom to top  ————————

Measured intervals
of space appear in
between each turn
representing space
*and* distance; this
portrayal of measured
space is confirmed
with a measurement
that people are already
familiar with (miles)

Consistent grid
system used to relay
information; organizes
information into
four columns:
    1. Turns (L and R)
    2. Direction of
       travel (arrows)
    3. Images
    4. Distance  ——————

Usage of the same
symbol to create
an entrance into
experience as
well as to push
viewer through the
experience; this
contains the viewer
within this symbol
throughout the entire
path (i.e. enter into
house, "house" then
travels throughout
directions)

Symbol/icon of
a house used for
starting point, then
systematically turned
into arrow shape to
propose direction  ——————

IDEATION

Initial Design 3



R

0.7 Miles

R

0.1 Miles

L

0.3 Miles

R

1.7 Miles

L

START
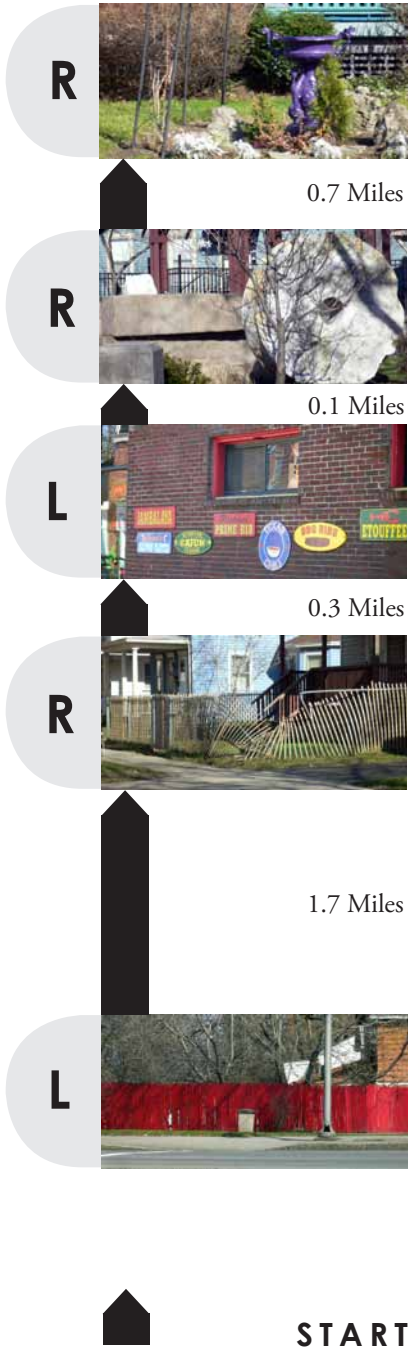
## Key Design Elements

## Key Game Elements

Instead of using
an arrow to direct
movement, movement
is implied through use
of consistent increase
of color saturation
as destination gets
closer and closer

Separation of
public and private
information: all images
of publicly viewed
environment placed in
one column; all private
information appear as
"add-ons" to the basic
column of images

Hierarchy of
information presented
by using only two
vertical grids, one
for miles to travel,
and another for the
images and distance
between each turn;
by organizing main
information through
graphic means detailed
information can then
be added onto existing
system (i.e. tabbing
each turn with
an L or R)

Use of specific interval
of space (height of
image) as guideline
to represent distances
between each turn

# I D E A T I O N

Initial Design 4



0.7 Miles

0.1 Miles

0.3 Miles
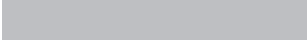
1.7 Miles

**Key Design Elements**

**Key Game Elements**

Additional signaling
through bars of color
placed on either the
left or right side of
the central line

Images represent locations
where action takes place,
reminiscent of board
game spaces in which
each space provides new
information or direction

Images placed in a row
on the central line of
vision for the driver in
order to emphasize the
main information

Gradation of rules
going from light to dark
as a visual interpretation
of motion

Measured interval of
space used to visually
represent 1 mile

Introducing the driver
into the travel path
by using a symbol
representing the
speedometer of a car
to signal go or start

# IDEATION

Initial Design 5

R

0.7 Miles

R

0.1 Miles

L

0.3 Miles

R

1.7 Miles

L
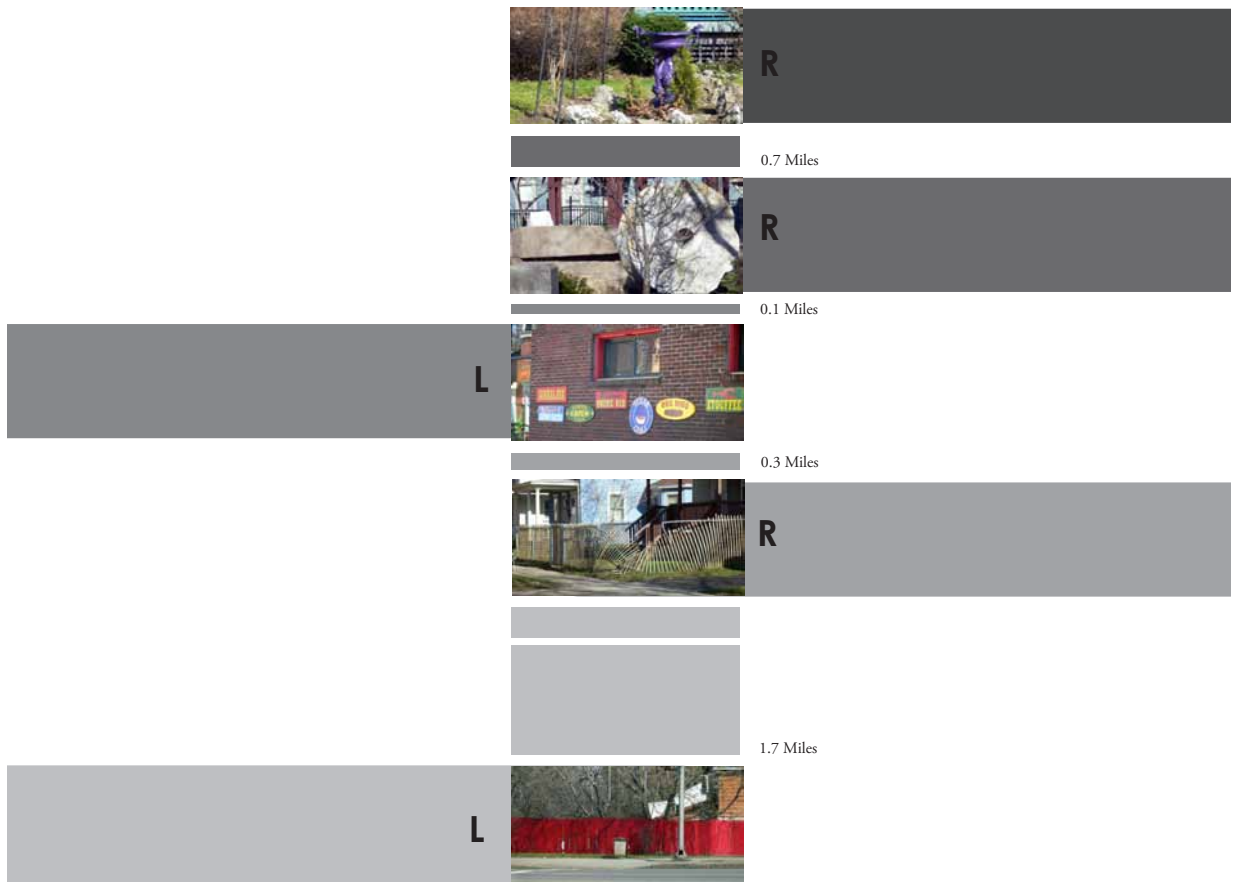
## Intermediate Design Stage

In order to create a single, well-developed route for experimentation, the chosen path was selected by looking into different scenarios that may benefit from experiential driving directions rather than efficient driving directions.

The path devised and tested was designed for a select group of undergraduate students. The RIT campus provides a diverse crowd that includes both newcomers of Rochester, NY as well as childhood residents of the city.

Here is a list of all streets and highways the student subjects will encounter on their trip. On the following page is a map depicting the actual round-trip route. The *Google Maps* driving directions subjects used to travel from RIT to downtown Rochester appears in *Appendix B* as *Design A*.

*To Downtown Rochester*
*Using Google Maps (A)*

*From Downtown Rochester*
*Using New Design (B or C)*

1 **RIT**
 Lomb Memorial Drive
 Jefferson Road
 Brighton Henrietta Townline Road
 West Henrietta Road
 East River Road
 I-390 South
 I-590 North
 I-490 West
 Culver Road
 Park Avenue
2 **Gallery r**
 Park Avenue
 Culver Road
 Monroe Avenue
3 **Bug Jar**

3 **Bug Jar**
 Monroe Avenue
 East Avenue
 Culver Road
 Park Avenue
2 **Gallery r**
 Alexander Street
 South Avenue
 Reservoir Street
 Mount Hope Avenue
 Brighton Henrietta Townline Road
 Jefferson Road
 Lomb Memorial Drive
1 **RIT**

*Using Google Maps (A)*

RIT → Gallery r → Bug Jar
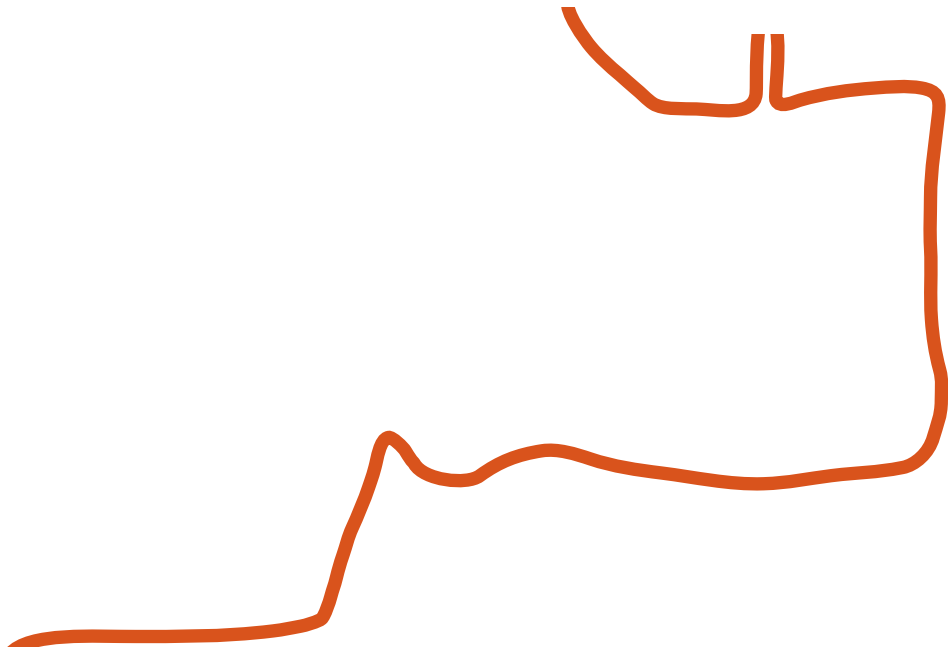
### Intermediate Design Stage (Continued)

Below is a map of the round-trip that subjects will be asked to take. Subjects will be using *Google Maps* (A) to get to their destinations Gallery r and the Bug Jar. Afterwards, they will use the new design (B or C) to get back to Rochester Institute of Technology. The overlay of these two paths shows the difference between the two routes of subjects going to and coming from the downtown Rochester area. The transparency also allows the reader to see where the two different paths may overlap.

*Using New Design (B or C)*

Bug Jar → Gallery r → RIT
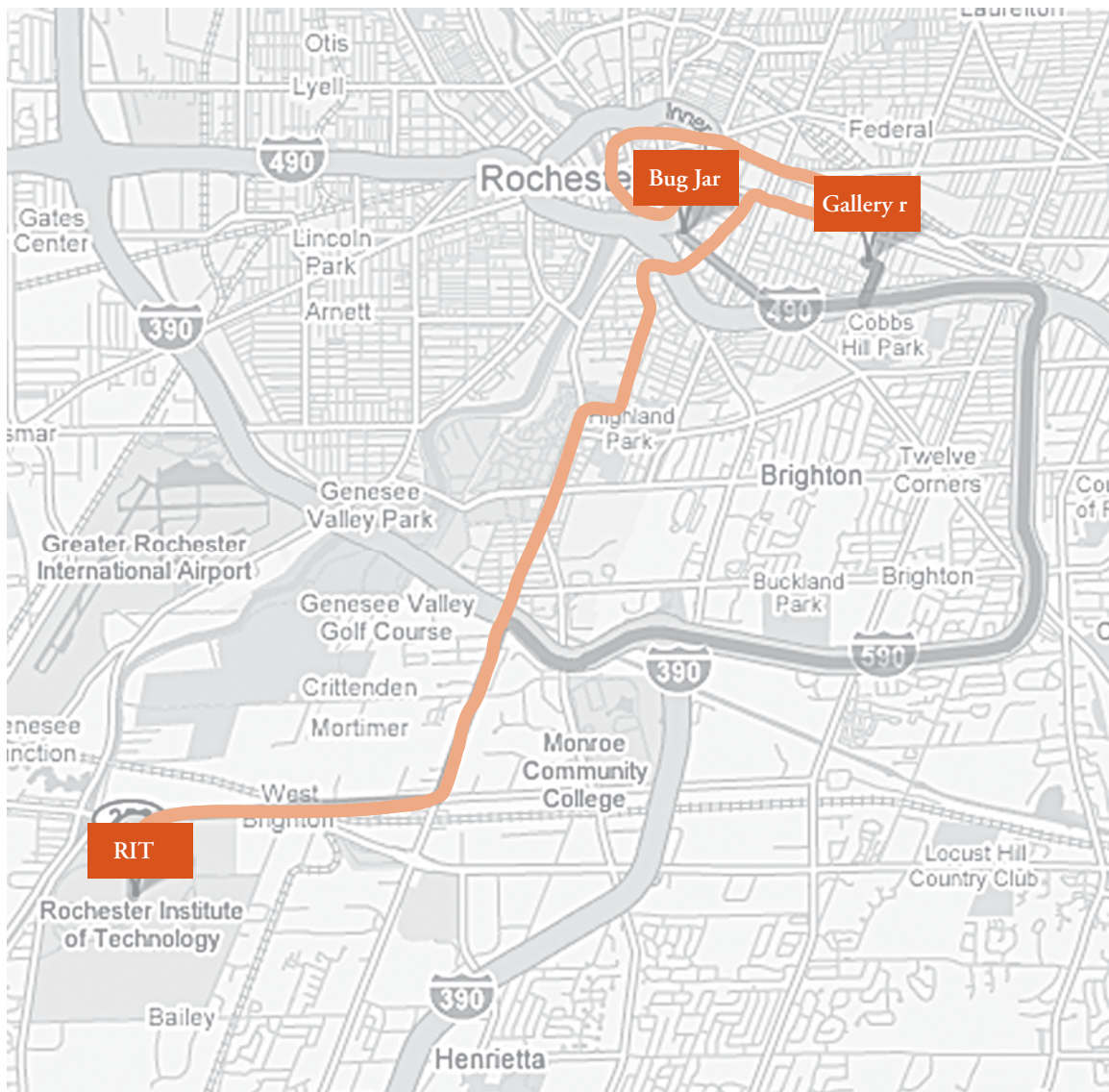


**Map provided by** *Google*

## Final Design Stage

Based on the design concepts previously shown, three designs were created for the route from Downtown Rochester back to RIT. Out of these three, two final designs were chosen for testing.

The three designs integrate aspects from previous design concepts with the content of the actual driving directions and select venues as a constant. The venues listed are from four categories: Restaurants, Coffee Shops, Shopping, and Points of Interest. These categories are used only for this test and were chosen for the intended scenario (see page 65). The mock scenario chosen for this project helped narrow down the types of venues into these four categories, which represent places to go or things to do for a student in between a day's activities. For example, before going to a concert one might want to grab a cup of coffee or a bite to eat. For added customization, future users would potentially be able to select the types of venues they are interested in rather than being restricted to these four categories.

On the following pages are single-page examples from each of the three designs. Full versions of each design appear in *Appendix B*.

**I D E A T I O N**

## Intermediate Design 1

The goal of this design was to create a balance between efﬁcient driving directions such as *Google Maps* while providing the user with insights into his / her physical surroundings. Through the use of text, this driving direction set provides the user with the clarity of information and ease of use that current driving directions provide. In addition, it efﬁciently provides the user with extra content about the user's surroundings. This information is introduced into the design in a way that allows the user to choose whether to use or ignore the auxiliary information. Rather than emphasize the venues, they are subdued by the absence of images. This is accomplished by blending the venues and directions together and communicating both through text. By doing so the design prevents the venues from overshadowing the actual driving directions (a situation that could possibly occur with the use of imagery).

**1**

**TO DO**
Lunch/Hangout
**Gallery R**
Cofﬂee
Dinner
**Bug Jar**
Drinks

Cheesy Eddie's

Open Face

Godiva's

:nook

Abner Cole Walking Timeline

The German House

**South Ave  L**

Lamberton Conservatory

Highland Park

**R  Reservoir Ave**

Empire Comics

Mt. Hope Cemetery

Pakistan House

Jay's Diner

Movies 10

Seoul Garden

**W. Henrietta  L**

**S T A R T**
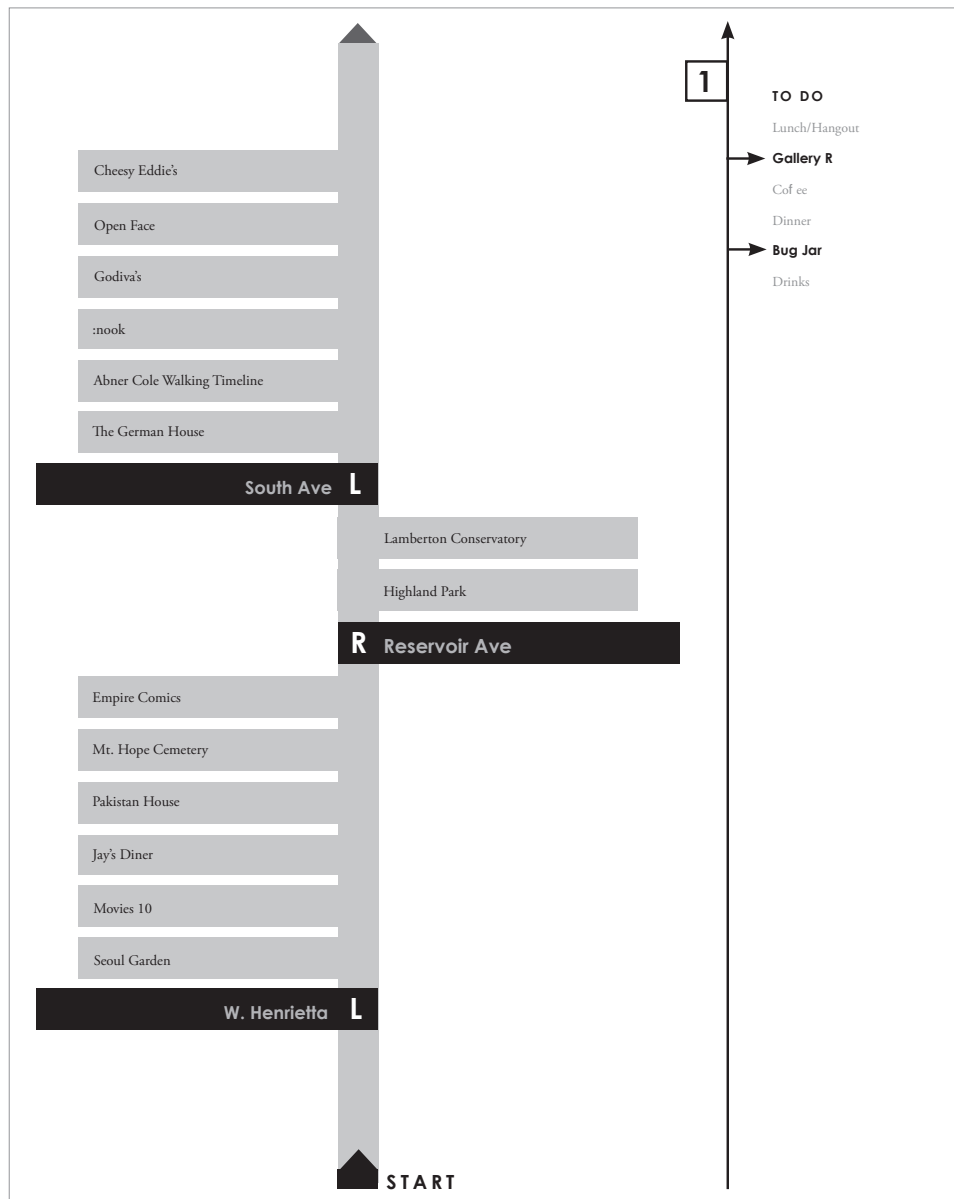
## Intermediate Design 1 Elaboration

The design on the previous page was then further enhanced by adding more information to each venue and icons highlighting the type of venue. The additional information added can be benefcial in testing which types of information are necessary or unnecessary to a person when getting to know an area. The added icons labeling each type of venue provides the user with a tool that helps him look ahead at venue options he may encounter. For example, if the user was on a certain street and felt like getting a cup of cofee, he can look down the row of icons and see whether or not a cofee stop is nearby. This driving direction set appears in its entirety in *Appendix B* as *Design B*.



ITINERARY

**Bug Jar ➤ Gallery R**
*3.3 Miles*
*10 Mins*

**Gallery R ➤ RIT**
*8.1 Miles*
*21 Mins*

| | | |
|---|---|---|
| Utta Clutta | 121 Park Ave | Vintage knickknacks |
| Parkleigh | 215 Park Ave | Specialty gift shop |
| Jine's Restaurant | 658 Park Ave | Neighborhood diner |
| Magnolia's | 336 Park Ave | 10% student discount |
| Lakeshore Records | 370 Park Ave | Indie music source |
| Chester Cab Pizza | 707 Park Ave | Voted #1 pizza |

**1.1 Miles     Park Ave   L**

**GALLERY R**   775 Park Ave   *RIT's art and design gallery*

**R   Park Ave**   0.1 Miles

**R   Culver Rd**   0.2 Miles

| | | |
|---|---|---|
| George Eastman House | 900 East Ave | Kodak founder |
| Rochester Museum & Science Center | 647 East Ave | Science museum |
| Rochester Historical Society | 485 East Ave | Museum and society |
| Little Theater | 240 East Ave | Indie flm theater |
| Spot Coffee | 200 East Ave | Coffee and live music |

**R   East Ave**   1.6 Miles

| | | |
|---|---|---|
| Manhattan Square Park | Brown & Court St | City park |
| Strong Museum | 1 Manhattan Sq | Children's museum |
| Damian's Pub | 81 Marshall St | Pub fare |

**1.4 Miles     Monroe Ave   L**

**BUG JAR**   219 Monroe Ave   *Live music and bar*

**START**

RECOMMENDATIONS

◉ Restaurant
◎ Cofee Shop
○ Point of Interest
● Shopping

**I D E A T I O N**

## Intermediate Design 2

This design attempts to provide clear and straightforward information about certain locations in the user's physical environment in order to bring attention to locations within the driver's path. The main driving directions appear as a strip running across the top of each page. Each recommended venue is presented with an image and venue information. In certain ways this set, as compared to *Intermediate Design 1* on page 76, provides the user with more interaction. For instance, the user can look ahead at the driving directions and see beforehand certain types of venues that he may want to visit. Even if the user does not look ahead to see if anything is of interest, he may be involuntarily influenced by catching a glimpse of a venue image in the periphery. When seeing the same image along the physical driving path, it may cause the user to give the venue or surrounding area a second look.



**L**  Park Ave (1.1 m)

**1**

**R**  Park Ave (0.1 m)

**DESTINATIONS**

**1** Gallery R
775 Park Ave
585.242.9470
Th-Fr. 2pm-6pm
Sa-Su. 1pm-5pm

**2** Bug Jar
219 Monroe Ave
M.W-F.Su. DJs
Th.Sa. Live band

**RECOMMENDATIONS**

Point of Interest

Restaurant

Coffee Shop

Shopping

**Utta Clutter**
121 Park Ave
Reseller of
vintage
knickknacks

**Gallery R**
775 Park Ave
Th-F. 2p-6p
Sa.-Su. 1p-5p
RIT's own
gallery of art
and design

**Parkleigh**
215 Park Ave
M-F. 10a-9p
Sa. 10a-6p
Su. 10a-5p
Everything from
specialty coffee
to stationery and
tableware

**Jine's Restaurant**
658 Park Ave
M-Sa. 7a-10p
Su. 7a-8p
Neighborhood
diner
$

**Magnolia's**
336 Park Ave
M-Th. 10a-9p
F-Su. 10a-10p
Deli and cafe
10% student
discount
$

**Lakeshore Record Exchange**
370 Park Ave
M-Sa. 10a-9p
Su. 12p-5p
Indie and
alternative
music source

**Chester Cab Pizza**
707 Park Ave
Su-W. 11a-9:30p
Th. 11a-10:30p
F-Sa. 11a-11:30p
Voted #1 Pizza in
Rochester

## Intermediate Design 2 Elaboration

Further improvements were made to the main directions at the top of the page in order to improve clarity. These included numbering each direction and taking away the visual signaling of each left and right turn. In this version, the turns are not signaled by the left and right placement of the black rules denoting left and right turns, but instead, are placed on the same horizontal grid to subtract from any confusion that may arise from the original placement. These changes provide clarity and ease of use to its user, thus preventing any confusion that may appear in the actual direction information and allowing the user to focus on his/her physical surroundings. This driving direction set appears in its entirety in *Appendix B* as *Design D*.

**①**

**②**

**Bug Jar** *219 Monroe Ave* →

**L**  Monroe Ave (1.4 m)

**L**  East Ave (1.6 m)

**DESTINATIONS**

**A**  **Gallery R**
775 Park Ave
585.242.9470
Th-Fr. 2pm-6pm
Sa-Su. 1pm-5pm

**B**  RIT
56 Lomb Dr

**Damian's Pub**
81 Marshall St.
F-Sa. 4p-2a
Pub fare

**Strong Museum**
1 Manhattan Sq
M-Th. 10a-5p
F. 10a-8p
Sa. 10a-5p
Su. 12p-5p
International
museum of play

**Manhattan
Square Park**
Brown St. and
Court St.
Park with concert
stage and fountain,
seasonal ice rink

**Spot Coffee**
200 East Ave
M-Th. 6a-11p
F. 6a-12a
Sa. 7a-12a
Su. 7a-11p
Local hangout
with occasional
live music

**Little
Theatre**
240 East Ave
Showing
independent
and foreign
films in limited
release

**Rochester
Historical
Society**
485 East Ave
M-F. 10a-3p
Rochester's
oldest
surviving
museum

**RMSC**
647 East Ave
Seasonal
Hours.
Science
museum,
planetarium,
and herb
garden

**George
Eastman
House**
900 East Ave
T-W. F-Sa.10a-5p
Th. 10a-8p
Su. 1p-5p
Home of
Kodak founder

**RECOMMENDATIONS**

Entertainment

Restaurant

Coffee Shop

Shopping

## Intermediate Design 3

The basis for this approach is to direct the user's attention towards details in his/her physical surroundings that are typically lost during the driving experience. Images detailing the city of Rochester attempt to provoke the user of this driving direction set to pay closer attention to the path that he is traveling. The images selected are views of Rochester that occur at each corner of a turn that the driver is to make. By providing the driver with formal as well as informal landmarks throughout Rochester, the goal of this driving direction set is to encourage the driver to look side to side at the surrounding environment to catch details of Rochester that have the potential to enhance a familiar space.

| START | Gallery R<br>775 Park Av | END | RIT<br>56 Lomb Memorial Dr | | TRAVEL TIME | 8.1 Miles<br>21 mins |
|---|---|---|---|---|---|---|

*0.2 miles*

**R** on Park St

*0.2 miles*

**R** on Culver St

Rochester Museum & Science Center

Rochester Historical Society

Spot Coffee

George Eastman House

Little Theater

*1.2 miles*

**L** on East Ave

George Eastman House

Rochester Museum & Science Center

Rochester Historical Society

Spot Coffee

Little Theater

## Intermediate Design 3 Elaboration

Improvements were made to further enhance the left and right signaling within the driving directions. This was done by adding a thick grey band which extended from each turn toward its respective side. The grey bars serve to provide the user with an easier and faster recognition of turns to be made. The complexity of the original version of this driving direction set, shown on page 79, was simplified to include only the necessary visual elements. For example, to avoid confusion in the presentation of the recommended venues, the horizontal rules were taken away since the small squares already established a horizontal flow. This driving direction set appears in its entirety in *Appendix B* as *Design C*.

## Selecting Final Test Designs

The two f nal test designs were selected for the contrasts in decisions that could be compared and analyzed. Intermediate Design 1 and 3 were selected because they provided the most benef cial and interesting comparisons. Below is a list of key comparisons that can be made between the two.
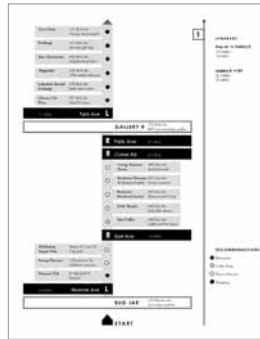


**Intermediate Design 1**

**Intermediate Design 3**

| | |
|---|---|
| Vertical orientation | Horizontal orientation |
| Bottom to top order | Top to bottom order |
| Text dominant | Image dominant |
| More information | Less information |
| Use of icons | No use of icons |
| Visual page transitions | No visual page transitions |
| Distance relationship between streets | Distance relationship between venues |
| Visual signaling of *L* and *R* through placement | Visual signaling through placement and graphic elements |

The two chosen designs were tested in order to see which of the two was not only best suited for the needs of a driver trying to get to a destination but most importantly which of the two served to best enhance the physical surroundings of the driver. The main goal of the tests was to see whether or not such a change on an everyday experience such as following a map or other kinds of driving directions can actually af ect the way we view and interpret space.

Complete versions of each of these f nal designs are included in *Appendix B*.

# INTERMEDIATE EVALUATION

*Testing the design application through an evaluation of the project's functionality and benefits to a select group of users*

## Evaluation

An evaluation of the two proposed designs, shown on pages 76 and 80, took place during May 6-11 of 2007. This evaluation not only tested technical and conceptual functionality, but also tested the other, less tangible benefits and perceived interest toward the design application project.

This evaluation consisted of 16 test subjects divided into two main test groups: Group 1 was familiar with the city of Rochester and Group 2 was unfamiliar with the city of Rochester. The variable of being either familiar or unfamiliar with the Rochester area allowed the test to show whether or not the new system could prompt an awareness of new items or locations for both familiar residents and unfamiliar residents. Each test subject traveled alone and provided individual survey feedback.

Regardless of which group a subject was in, all test subjects were asked to make a trip from the RIT campus to Gallery r, and from Gallery r to the Bug Jar using *Google Maps* driving directions which are easily accessible through the internet. *Google Maps* is referred to below and in subsequent text as *Design A*. The two designs being tested are labeled as *Design B* and *Design C*.

After students reached the Bug Jar, they were all required to then follow the reverse trip back to RIT: the Bug Jar to Gallery r, Gallery r to RIT. However, on the reverse trip, each group was further divided. Groups were divided into 2 groups of 4 students each. 4 of the students in Group 1 used *Design B* while the other 4 students used *Design C*. Group 2 was split in the same fashion.

Below is a diagram depicting the evaluation process. Items in black denote control elements and orange items highlight variable elements.



*Key*
A    Google Maps  (Efﬁcient)
B    Design 1       (Efﬁcient/Experiential)
C    Design 2       (Experiential)
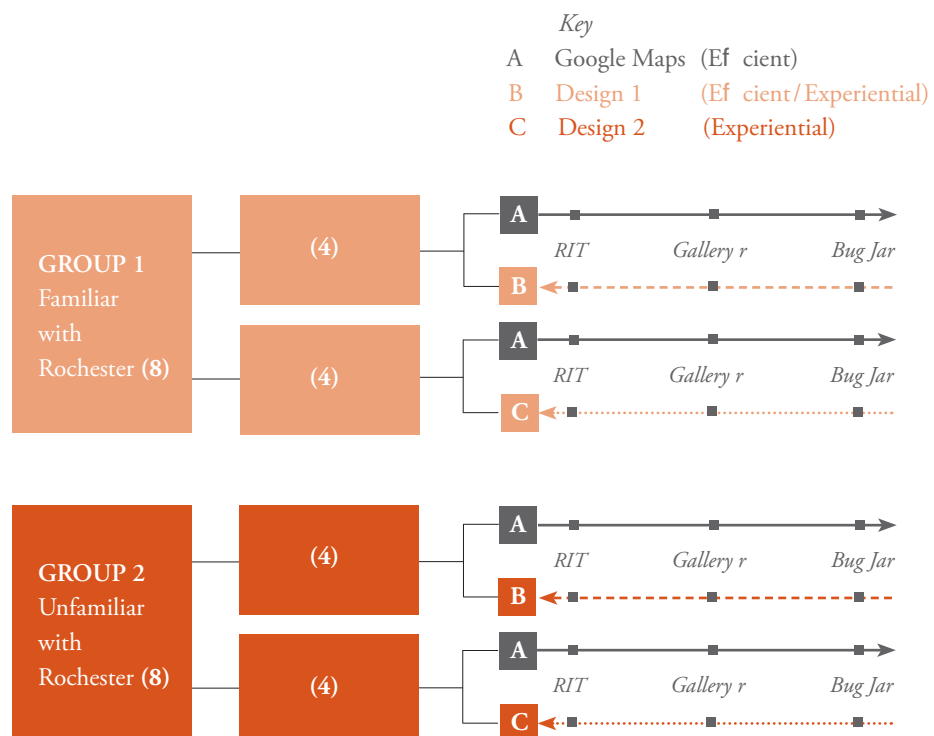
## Evaluation (Continued)

On the day of the test, each of the 16 subjects received two sealed envelopes. Test subjects were asked to open each envelope one at a time in the order that they were numbered. Each envelope contained a driving direction set and a separate sealed envelope holding a survey the subject was to take after each drive.

Below are images of the actual envelopes and contents given to each subject. As a reminder, *Design A* refers to *Google Maps* and *Design B* and *C* are the two new designs being tested.

The following pages include the surveys used in the test and the different types of questions that were asked.



Each student received two packets labeled *Step 1* and *Step 2*. Directions given on the packet instruct the traveler to use the driving directions enclosed and take the survey *after* each drive



Enclosed in Step 1 envelope: *Design A* and sealed Survey A



Enclosed in Step 2 envelope: *Design B* and sealed Survey B (top) *or* *Design C* and sealed Survey C (below)
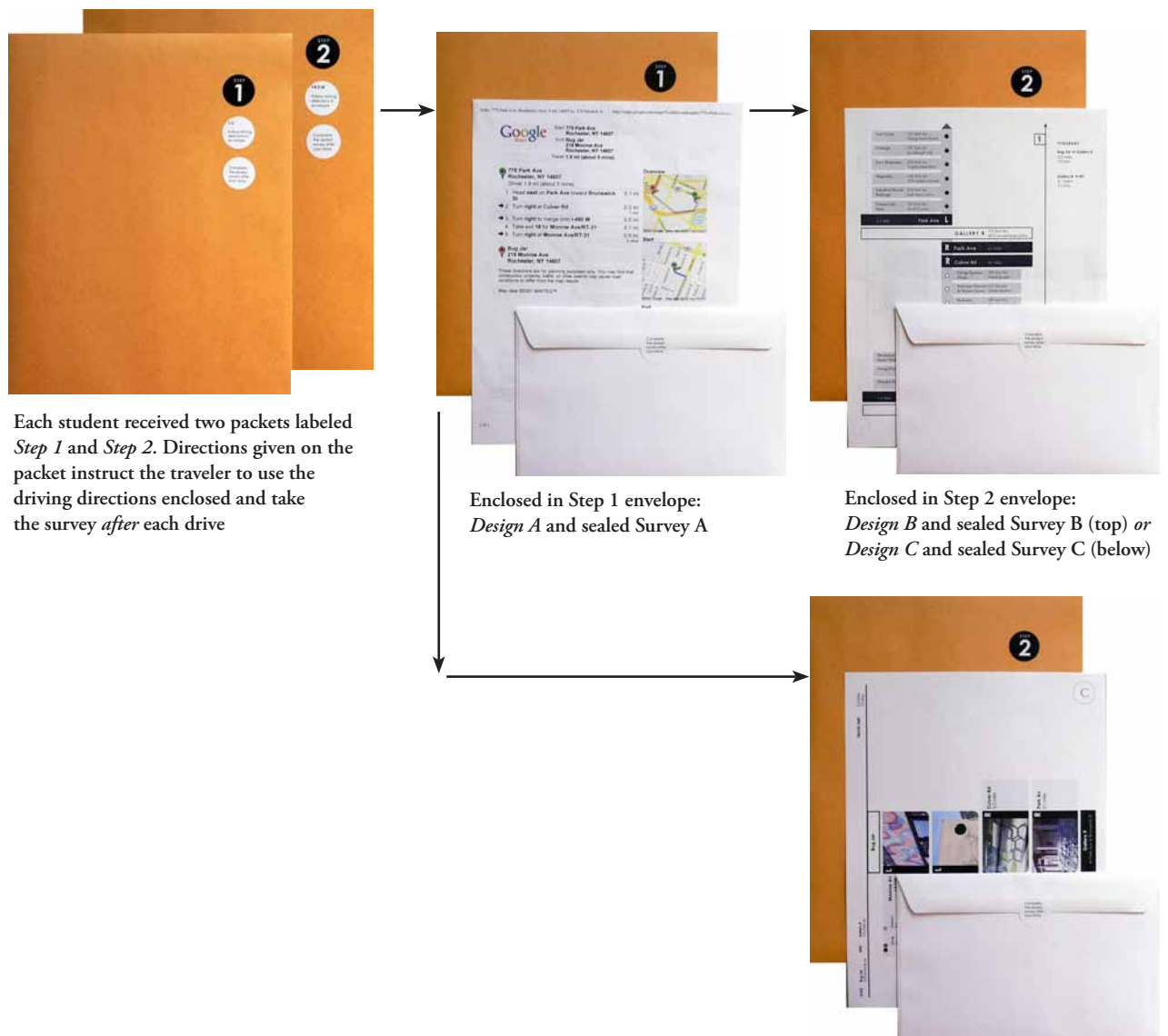
INTERMEDIATE EVALUATION

**Preliminary Questionnaire**

This questionnaire was used in order to place a student into one of the two test groups as well as test their overall suitability for the test.

NAME _____

Do you own a car?          Y          N

Please complete TWO preferred modes of contact

E-Mail _____     IM _____     Phone _____

How long have you lived in Rochester? _____   ☐ City   ☐ Suburb

How many days a week do you actually go into the downtown Rochester area? _____

What are your favorite locations in Rochester (street, region, or sector)? _____
_____

What are your favorite locations in Henrietta? _____
_____

Please use a few words to describe your impressions of Rochester *city.* _____
_____

What activities do you typically enjoy doing? Check all that apply.

☐ Movies          ☐ Museums          ☐ Parks/Nature          ☐ Clubs/Bars
☐ Cof ee shops    ☐ Shopping         ☐ Church/Religious      ☐ Concerts/Music

How many times a week do you attend the activities you've checked above? _____

How do you usually get to know a new area? Check all that apply.

☐ Guidebooks     ☐ Personal Recommendations     ☐ Local Newspapers
☐ Maps           ☐ Online Reviews/Guides         ☐ Driving/Walking Around

Which of the following driving directions/trip planners have you used?

☐ Google Maps    ☐ Mapquest    ☐ GPS Navigation    ☐ AAA TripTik
☐ Other online road trip advisors _____

Of the above, which do you *regularly* use? _____

# INTERMEDIATE EVALUATION

*Design A*
**Survey**

This survey was taken by each student after they had completed the first half of the drive using *Google Maps* driving directions (also referred to as *Design A)*.

---

**A** Questions in this survey refer to **SET A**

**NAME** _____

### COMPREHENSION

Were there any challenges getting to your two main destinations?  Y  N

If yes, what were the specific problems? _____

_____

In the written directions did you depend more on [ ] Time [ ] Miles
i.e. "3 Mins" i.e. "0.2 Miles"

### CLARITY

*Rate the **clarity** and **accessibility** of the following*  **−**  **+**  *\*Extra comments*

| | | | | | |
|---|---|---|---|---|---|
| Wording of the text | 1 | 2 | 3 | 4 | 5 |
| Readability of text | 1 | 2 | 3 | 4 | 5 |
| Text size | 1 | 2 | 3 | 4 | 5 |
| Text spacing | 1 | 2 | 3 | 4 | 5 |
| Clarity of map images | 1 | 2 | 3 | 4 | 5 |
| Understanding of icons used (start, stop, right, left) | 1 | 2 | 3 | 4 | 5 |

### USEFULNESS

*Rate the **usefulness** of the following*  **−**  **+**  *\*Extra comments*

| | | | | | |
|---|---|---|---|---|---|
| Bold lettering for turns and street names within directions | 1 | 2 | 3 | 4 | 5 |
| Repetition of start and end addresses | 1 | 2 | 3 | 4 | 5 |
| Inclusion of map images | 1 | 2 | 3 | 4 | 5 |

### OTHER

Did you discover anything new along your trip? If yes, what specifically? _____

Have your impressions of the City of Rochester changed as a result of this trip? If yes, how? _____

_____

What changes, if any, would you make to these driving directions? _____

_____

# INTERMEDIATE EVALUATION

*Design B*
**Survey: Page 1**

This survey was taken individually by each student after having driven back to RIT using *Design B*.

**B** Questions in this survey refer to **SET B**

NAME _____

**COMPREHENSION**

Did you have any challenges getting to your two main destinations?     Y          N

If yes, what were the specif c problems?  _____
_____

Approximately how long did it take you to understand the new driving directions format?  _____

*Looking at driving direction* **SET B** *that you just used, please complete the following questions.*

Circle the f rst direction.

What street is the **Abner Cole Walking Timeline** on? _____

After you turn left on **South Avenue**, how many miles do you travel before your next turn? _____

What is the trip's total time and miles?  _____

**CLARITY**

*Please rate the* **clarity** *and* **accessibility** *of the following*          –                    +

| | | | | | |
|---|---|---|---|---|---|
| Sequence of the directions | 1 | 2 | 3 | 4 | 5 |
| When to make a turn | 1 | 2 | 3 | 4 | 5 |
| Which street the recommended venues are on | 1 | 2 | 3 | 4 | 5 |
| Transitioning from one page to the next | 1 | 2 | 3 | 4 | 5 |
| When you've reached a destination | 1 | 2 | 3 | 4 | 5 |
| Icons that highlight the types of venues | 1 | 2 | 3 | 4 | 5 |
| Font used | 1 | 2 | 3 | 4 | 5 |
| Wording of text descriptions | 1 | 2 | 3 | 4 | 5 |

Was the text size too small?                    Y          N

*Design B*
**Survey: Page 2**

**B** Questions in this
survey refer to **SET B**

**USEFULNESS**

*Rate the* **usefulness** *of the following*                                    **–**                    **+**

Left and right turn signaling indicated by placement of          1     2     3     4     5
text and images (i.e. left turn = all information on left side)

Inclusion of business address                                              1     2     3     4     5

Inclusion of brief description of venue                                   1     2     3     4     5

Were there any details you found necessary but missing from the venue listings? _____

_____

Icons that highlight different types of venues                        1     2     3     4     5

Repeating trip itinerary on each page                                  1     2     3     4     5

Would you ever use Driving Directions B in the future?             Y             N

Why or why not? _____

_____

*Design B*
**Survey: Page 3**

**B** Questions in this survey refer to **SET B**

NAME _____

■ **OTHER**

On your trip back to RIT, did you find anything new *within* the recommended venues? _____

_____

Did you find anything new *in addition* to the recommended venues? _____

_____

Have your impressions of the City of Rochester changed as a result of this trip? If yes, how? _____

_____

What changes, if any, would you make to these driving directions? _____

_____

*Comparing* **ONLY** *the two sets you test drove* (**SET A and SET B**)*:*

Which do you feel offers clearer information?                    A          B

Which do you feel offers more useful information?              A          B

Which do you feel further enhances your surroundings?       A          B

*Compare the three sample driving directions included with this survey.* *You used* **SET A** *and* **SET B** during your test drive

Which of the 3 driving directions would you use for a quick trip? Please circle all that apply.          A          B          C

Which of the 3 would you use for a leisurely day? Please circle all that apply.          A          B          C

*Design C*
**Survey: Page 1**

This survey was taken by each student after having driven back to RIT using Design C.

**C** Questions in this survey refer to **SET C**

**FIRST NAME** _____

■ **COMPREHENSION**

Did you have any challenges getting to your two main destinations?     Y          N

If yes, what were the specifc problems? _____

_____

Approximately how long did it take you to understand the new driving directions format? _____

*Looking at driving direction* **SET C** *that you just used, please complete the following questions.*

Circle the frst direction.

What street is the **Abner Cole Walking Timeline** on? _____

After you turn left on **South Avenue**, how many miles do you travel before your next turn? _____

What is the trip's total time and miles? _____

■ **CLARITY**

| *Please rate the* **clarity** *and* **accessibility** *of the following* | − | | | | + |
|---|---|---|---|---|---|
| Sequence of the directions | 1 | 2 | 3 | 4 | 5 |
| When to make a turn | 1 | 2 | 3 | 4 | 5 |
| Which street the recommended venues are on | 1 | 2 | 3 | 4 | 5 |
| Transitioning from one page to the next | 1 | 2 | 3 | 4 | 5 |
| When you've reached a destination | 1 | 2 | 3 | 4 | 5 |
| Font used | 1 | 2 | 3 | 4 | 5 |

Were the images too small?                    Y          N

Was the text size too small?                    Y          N

*Continued on reverse*

*Design C*
**Survey: Page 2**

**C** Questions in this
survey refer to **SET C**

**USEFULNESS**

*Rate the* **usefulness** *of the following*                                                  **–**                    **+**

| | |
|---|---|
| Inclusion of images | 1    2    3    4    5 |
| Content within images | 1    2    3    4    5 |
| Left and right turn signaling indicated by placement of text and images (i.e. left turn = all information on left side) | 1    2    3    4    5 |

Were there any details you found missing from the venue listings that you feel should be included?

☐ Business Address     ☐ Business Phone Number     ☐ Interesting Facts/History     ☐ Hours of Operation

☐ Images of venues     ☐ Other

| | |
|---|---|
| Icons that highlight diferent types of venues | 1    2    3    4    5 |
| Repeating trip itinerary on each page | 1    2    3    4    5 |

Would you ever use Driving Directions C in the future?                    Y                    N

Why or why not? _____

_____

INTERMEDIATE EVALUATION

*Design C*
**Survey: Page 3**

**C** Questions in this
survey refer to **SET C**

**FIRST
NAME** _____

**OTHER**

On your trip back to RIT, did you find anything new *within* the recommended venues? _____
_____

Did you find anything new *in addition* to the recommended venues? _____
_____

Have your impressions of the City of Rochester changed as a result of this trip? If yes, how? _____
_____

What changes, if any, would you make to these driving directions? _____
_____

*Comparing* **ONLY** *the two sets you test drove* (**SET A and SET C**)*:*

Which do you feel offers clearer information?                    A          C

Which do you feel offers more useful information?              A          C

Which do you feel further enhances your surroundings?        A          C

*Compare the three sample driving directions included with this survey.  *You used* **SET A** *and* **SET C** *during your test drive*

Which of the 3 driving directions would you use for a quick trip? Please circle all that apply.       A          B          C

Which of the 3 would you use for a leisurely day? Please circle all that apply.        A          B          C

## Functionality

After the tests were completed, all surveys were compiled and organized into charts in order to visually see the ratings that users gave the designs. These charts are visual representations of ratings given on a scale of 1-5 to the categories of *clarity* and *usefulness* of each design decision.



**Design A (*Google Maps*)**

Design decisions showing over 75% positive feedback, were considered as attributes of *Google Maps* that could serve as beneficial influences on the new design solutions for this thesis application.

**Areas of Beneficial Feedback**

*Clarity of Typeface*
*Clarity of Icons*
*Usefulness of Bold Type*

**Total subjects: 16**

- ● Positive *(Rating of 4-5)*
- ● Neutral *(Rating of 3)*
- ● Negative *(Rating of 1-2)*

**Summarized Feedback from Surveys**
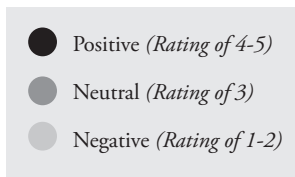
Clarity of



| *Text wording* | *Typeface* | *Map images* | *Icons* |

Usefulness of



| *Bold type* | *Repetition of addresses* | *Inclusion of maps* |
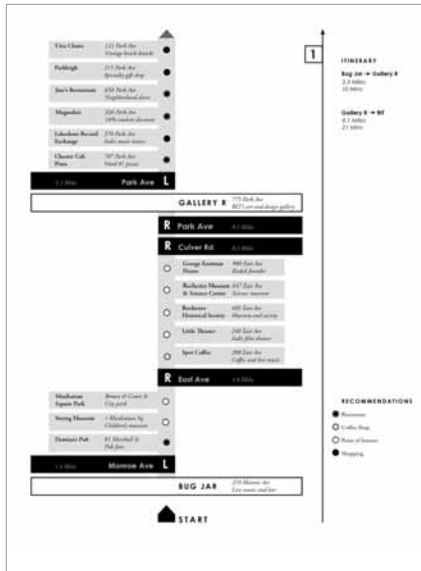
**Design B**

Data showing 50% or less positive feedback were considered as attributes in need of improvement.

**Areas of Necessary Improvement**

*Clarifying which street recommended venues are on*

*Redesigning icons*

*Considering larger text size*

*Figuring out how much and what kind of venue information to include*

*Reconsidering the repetition of the itinerary on each page*

**Summarized Feedback from Surveys**

**Total subjects: 8**

Clarity of

● Positive *(Rating of 4-5)*

● Neutral *(Rating of 3)*

○ Negative *(Rating of 1-2)*



*Sequence of directions*



*When to make a turn*



*Which street venues are on*



*Transitioning from each page*



*When destination is reached*



*Icons*



*Text size*

Usefulness of



*Left and right turn signaling*



*Inclusion of business address*



*Inclusion of venue description*



*Icons*



*Repetition of itinerary*

**Design C**

Data showing 50% or less positive feedback were considered as attributes in need of improvement.

**Areas of Necessary Improvement**

*Clarifying which street recommended venues are on*

*Transitioning from page to page*

*Clarifying when a destination is reached*

*Taking into consideration typeface decisions*

*Enlarging image size*

*Rethinking content of images*

**Summarized Feedback from Surveys**

**Total subjects: 8**

● Positive *(Rating of 4-5)*

● Neutral *(Rating of 3)*

● Negative *(Rating of 1-2)*
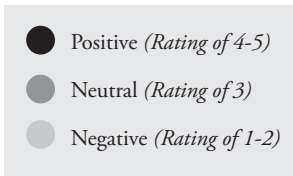
Clarity of



*Sequence of directions*
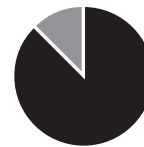


*When to make make a turn*



*Which street venues are on*



*Transitioning from each page*



*When destination is reached*



*Typeface*



*Text size*



*Image size*

Usefulness of
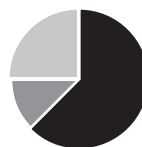


*Left and right turn signaling*



*Inclusion of images*



*Content of images*



*Repetition of itinerary*

## Functionality Summary

The survey data received suggests that *Design B* scored higher in regard to functionality. Although both *B* and *C* had similar problems, the charts displayed on pages 93 and 94 show that *Design B* not only had fewer problems but that those problems also had an overall smaller percentage of negative responses. Additional questions on the survey provided further test results on the functionality of *Designs B* and *C*. Below is a comparison of overall functionality and general comprehension of the two designs.

### Summarized Feedback from Surveys

**Design B**
**Total subjects: 8**

*5 out of 8 subjects had no problems getting to their destinations*

*7 out of 8 subjects scored 100% when tested for comprehension of the driving directions*

**Design C**
**Total subjects: 8**

*4 out of 8 subjects had no problems getting to their destinations*

*6 out of 8 subjects scored 100% when tested for comprehension of the driving directions*

## Qualitative Feedback

Further statistics taken from the completed surveys of er a more insightful picture of whether or not each design actually af ected subjects' impressions of Rochester's environment. Subjects' initial responses of their preexisting impressions of the city of Rochester showed a larger percentage of change after using *Designs B* and *C* as compared to using *Design A* (*Google Maps*) on their drives. While 3 out of the total 16 subjects noticed new venues on their drives using *Design A* (*Google Maps*), only 1 out of 16 subjects felt that their impressions of Rochester had changed.

Below are visual representations of the number of people who noticed a change in their impressions of Rochester before their drive using *Designs B* or *C*. The following pages of er written comments made by each subject before their trip, and after their trips using one of the two new designs.

**Summarized Feedback from Surveys**

**Design B**
**Total subjects: 8**

*7 out of 8 subjects experienced a change in their original impression of the city of Rochester*

*5 out of 8 subjects discovered new locations recommended to them*

*5 out of 8 subjects discovered new locations **not** recommended to them*

**Design C**
**Total subjects: 8**

*6 out of 8 subjects experienced a change in their original impression of the city of Rochester*

*4 out of 8 subjects discovered new locations recommended to them*

*4 out of 8 subjects discovered new locations **not** recommended to them*

## Qualitative Feedback (Continued)

Each individual was asked to state, in a few words, their impression of Rochester before and after their trip. This chart shows the responses from subjects who drove with *Design B.*

| | Design B Subjects | Descriptions of Rochester: Before | After |
|---|---|---|---|
| *Familiar with Rochester* | 1  Lennie | Badly planned, confusing to navigate | Mysterious / secretive in a good way |
| | 2  Stacy | Industrial, locally economical, acquired taste, music | *No recorded change* |
| | 3  Tara | Quaint, nostalgic, conservation, renewal | There are a lot more things to do then I thought there were |
| | 4  Brian | In parts it seems a bit run-down but there are many great areas worth exploring | Many small streets connected into one |
| *Unfamiliar with Rochester* | 5  Kayla | Complicated, somewhat dirty | I used to think Rochester was scary but it's actually full of pockets of places (kind of hidden) |
| | 6  Richard | Great place to get shot | More history involved |
| | 7  Debbie | Interesting buildings, alive in sectors | Seeing more schools makes it feel safe |
| | 8  Vanessa | Small and dangerous | I believe Rochester to be much more diverse than I had originally thought, it is very diverse for its population |

## Qualitative Feedback (Continued)

This chart shows the impressions of subjects who drove with *Design C.*

| | Design C Subjects | Descriptions of Rochester: Before | After |
|---|---|---|---|
| *Familiar with Rochester* | 9 Janice | Inner Loop is horrendous | I've always liked Rochester for its nature, now I think it's a lot more corporate or a lot more businesses have shown up |
| | 10 Connor | One-way, corporate headquarters | It's not as corporate but still difficult to navigate most of the time |
| | 11 Jean | Quaint, cute, small population | *No recorded change* |
| | 12 Susan | Relaxed and friendly people! | Feels more town-like than a city |
| *Unfamiliar with Rochester* | 13 Peter | Busy, congested, good distance away | Lots of special-to-Rochester things but no real names are attached to them, Rochester=lost identity town |
| | 14 Karen | Dull, dreary, rainy, boring | Not as dull as I thought, there are many streets and cool hangouts |
| | 15 Nick | Dangerous, scary, not enough street lights | No more boredom |
| | 16 Nicole | Where I have been is nice but I don't know downtown that well | *No recorded change* |

After reviewing all comments, it was observed that more than one person had expressed that the path they experienced while using driving directions *B* or *C* made them feel that Rochester had more places of interest and was a city that contained many hidden streets and locations that added a positive element of surprise to the city. Although Peter (Subject 13, *Design C*) was one subject who felt this way, he also felt that Rochester was a "lost identity town" in which all the great places Rochester had to offer failed to have much of a voice.

One interesting comment was made by Debbie (7, *Design B*) who noted that because she saw more schools along the way, it had cast a feeling of safety over Rochester. Another interesting comment to note was that Richard (6, *Design B*) felt that Rochester was more historical than he had originally imagined while Vanessa (8, *Design B*) commented on Rochester's heightened diversity for a population its size.

## Qualitative Feedback Summary

Data also served to show whether or not the design approach was useful or of interest to the subject. The surveys helped in answering whether or not the specif c design achieved the goal of this thesis, which has been to reintroduce physical surroundings to subjects/drivers through graphic design. The following chart shows votes from all 16 subjects in regards to the benef ts of *Designs B* and *C* when compared to current driving directions such as *Design A (Google Maps)*. Subjects were asked to vote for all designs they would use for a quick trip or a leisurely day.

Although *Design A* is the top selection for ef cient travel in this study, *Design B* and *C* both received favorable response for a day of leisure. This indicates that as long as subjects felt that they had the luxury of time they may have chosen *Designs B* or *C* to use in the future. Because a number of people also selected *Design B* for a quick trip, *Design B* may be a solution that could provide a good balance and be useful for both types of driving situations tested here.

| Use | Design A (Google Maps) | Design B | Design C |
|---|---|---|---|
| Quick Trip | | | |
| Leisurely Day | | | |
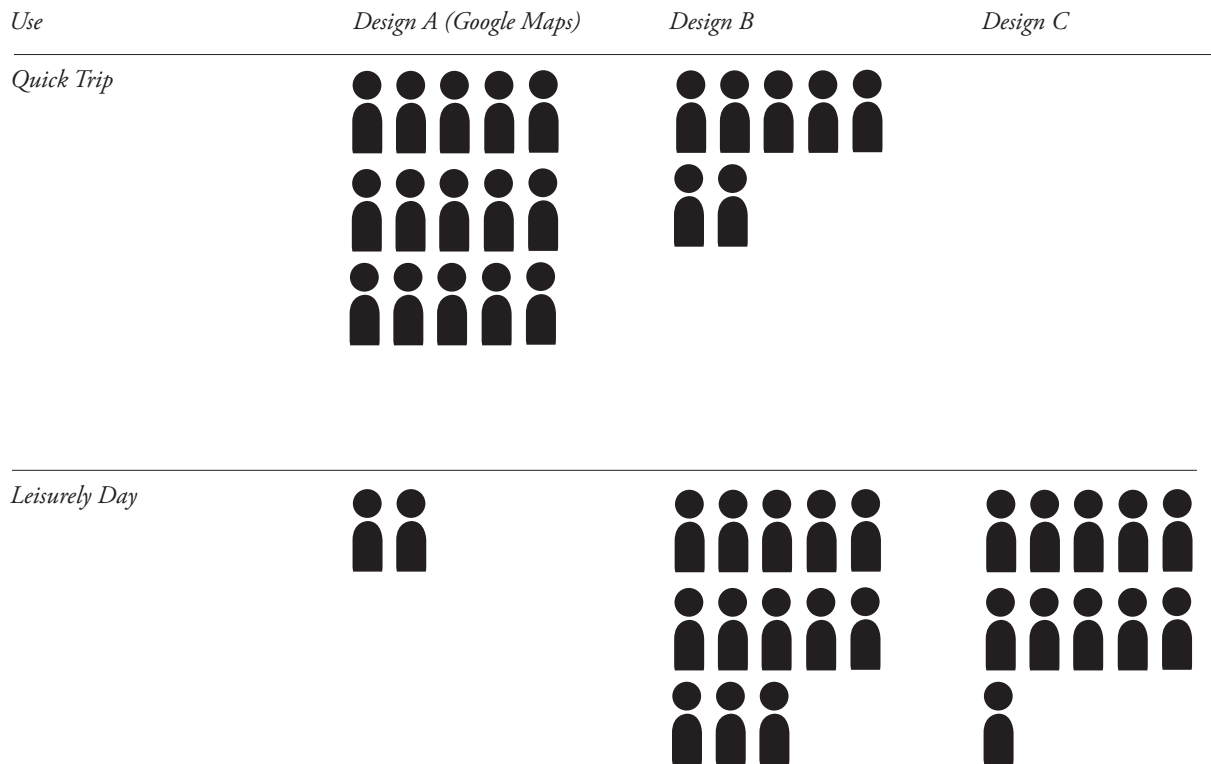
### Intermediate Evaluation Conclusion

In conclusion, through the processes of organizing the data received, *Design B* was more successful in both functionality and quality. Although both *Designs B* and *C* had influenced the subjects' general impression of Rochester and had successfully introduced subjects to more of the city's environment, *Design B* appeared to be closer to *Design A* (*Google Maps*) in terms of functionality results. Taking all this into consideration, *Design B* is the final layout chosen for implementation among the two tested. Integration of test feedback occurs for *Design B* in the *Implementation* section of this thesis.

# IMPLEMENTATION

*Incorporating feedback received in order to refine the final design solution*

## Key Considerations

In order to make certain that the final design not only functions well but also heightens the driving experience, feedback from the surveys is represented here as refinements made to the final product. As previously mentioned, this section will be dealing specifically with the improvement of *Design B*. For improved functionality of the driving directions, implementation will look to the original test scores that appear on page 93. In order to enhance the benefits of the design, suggestions from feedback will be incorporated. A list of key considerations for implementation are shown here.

### Functionality

Clarifying which street recommended venues are on

Redesigning icons

Considering larger text size

Figuring out how much and what kind of venue information to include
*Telephone numbers in place of address* (Vanessa, Subject 8)
*Business hours* (Brian, 4)

Reconsidering the repetition of the itinerary on each page

### Qualitative Feedback

Including images (Peter, 1)

Decreasing amount of information (Debbie, 7)

Adding color (Richard, 6)

## Implementing Feedback

The final solution to *Design B* incorporated changes as well as selected successful elements from *Design C* in order to reflect suggestions made. The final solution became a hybrid of beneficial design elements taken from *Designs B* and *C*.

*Design B*
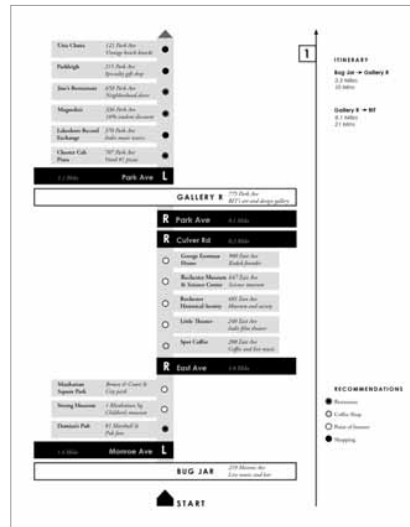
*Design C*



*Final Solution*

IMPLEMENTATION

## Implementation Summary

The following table describes the changes that were made in response to suggestions collected from the surveys. The f rst page of the f nal hybrid design solution appears on page 104. The complete new driving direction set appears in *Appendix C.*

| Functionality | Suggestions | Changes Made |
|---|---|---|
| | Clarifying which street recommended venues are on | In order to clearly depict which street various venues are on, all descriptive text was taken away to highlight venue addresses. In addition, by including the full address for the f rst venue listed and then using only the address number for following venues, it introduces the system that all venues are separated by the street they are located on. |
| | Redesigning icons | The inclusion of representational icons were added in order to prevent users from having to refer back to the key because of unfamiliar, abstracted symbols. |
| | Considering larger text size | Text was enlarged and content taken away in order to bring clarity and readability to the document. |
| | Figuring out how much and what kind of venue information to include | The additional information for each venue suggested by participants, such as business hours or phone numbers, will be included as options they can select in the interface design. The default driving direction layout will include only the business name and its address in order to maintain clarity. |
| | Reconsidering the repetition of the itinerary on each page | The repetition of the full itinerary on each page was further improved by highlighting only the part of the trip pertaining to each page. In order to do this, the destination information relevant to each page is in black, while the rest of the text is muted in grey. When the next section of the trip is being represented, the relevant text will be in black while all other text is muted and so on. The distance and time have also been updated to reflect a countdown of distance and time left on each page. In addition, page numbers were added as well as a vertical rule that decreases in length as each page of the trip progresses. This creates a visual representation of the pacing and duration of the trip. |
| Qualitative Feedback | Including images | The images originally included in *Design C* were incorporated into *Design B* in order to respond to a subject's suggestion (see page 101). The addition of imagery will hopefully influence users to look at their surrounding environment and become more aware of it while moving toward their destination. |
| | Decreasing amount of information | Information was taken away from the layout of the driving directions in order to create a default layout that users will add or subtract options from the layout through the web interface the driving directions will be generated from. Making a default layout allows for customization of the driving direction set. |
| | Adding color | The inclusion of imagery brings color and visual detail to the driving direction set to encourage more emotional responses from the user. |

## Final Solution

The complete driving direction set below appears in *Appendix C.*

1

**R** CULVER RD                          *0.2 Miles*



George Eastman House
*900*

Rochester Museum & Science Center
*647*

Rochester Historical Society
*485*

Little Theater
*240*

Spot Coffee
*200 East Ave*

**R** EAST AVE                          *1.6 Miles*



Manhattan Square Park
*Brown & Court St*

Strong Museum
*1 Manhattan Sq*

Damian's Pub
*81 Marshall St*

*1.4 Miles*          MONROE AVE    **L**



BUG JAR

START

**Bug Jar ➤ Gallery R**
*3.3 Miles*
*10 Mins*

**Gallery R ➤ RIT**
*8.1 Miles*
*21 Mins*

*Point of Interest*

*Restaurant*

*Coffee Shop*

*Shopping*

## IMPLEMENTATION



**Default settings: Images on, time set to afternoon (selected tools and options are highlighted in blue)**



**All selections off (no tools or options are selected, therefore none are highlighted)**



**All selections on (all tools and options are selected and are highlighted)**



**All selections on with time set to nighttime (all tools and options are highlighted in a darker shade of blue representing nighttime)**

## Further Developments

After completing the final design, further developments were made towards the web user interface that would feature this design. In order to add to the experience of using the new driving direction set, a digital interface was designed that serves to bridge the physical prints of the driving directions to its origins in virtual space.

The prototypical interface is designed to allow the user different selections and options for travel. The home page for this site will give the user a couple of scenarios to select in order to best define their trip purpose. Also included will be a default scenario: *Something Else*. The default site will have images and all venue options preselected in order to honor the original purpose of the driving directions, as opposed to having none of the options preselected. After the default page appears, the options may be de-selected or re-selected as the user desires. To the left are examples of what the website would look like when it is set to: 1) default, 2) all selections off, and 3) all selections on.

The selections a user can make are separated into *Tools* and *Options*, *Tools* being necessities and *Options* being desires. Another way of customizing the directions is by specifying the time of day the trip will take place. This will help decide specific venues that are more accessible and appropriate in regard to morning, afternoon or evening travel. For example, a morning trip with restaurant options will result in the mapping of breakfast locations. Daytime and nighttime settings are differentiated by a color change as shown to the left in the last image.

The appearance of the user controls reflects a dashboard. The tools and options available to the user are located at the bottom of the interface, leaving the top half of the interface for the directions to be built as users add and subtract tools and options. The ability for users to immediately view what their driving directions would look like allows them to see the length and level of detail of their directions. It would also let them easily and quickly view their constructed path and what it has to offer before printing hard copies. This adds a modular feel to the interface and further heightens the feeling of a custom-built path.

The design and function of the interface are detailed on the following page.

Directions are "built" in the top portion of the screen beginning from the bottom; a scrollbar is placed here in order to show the user that they will be scrolling up rather than down in order to view the rest of the path

If selected, would show recommended points of interest, coffee shops, restaurants, and / or shopping

Line represents a blank area that is ready for customization by the user; information will appear as selections are made

To bring attention to the selections made by the user, all selections are highlighted in either light blue (daytime) or dark blue (nighttime) against the grey control area

Hands of clock are draggable for user to set the time of departure

Plus and minus symbols conceptually represent zooming in and out of the path in terms of the level of detail users would like their driving directions to have; users can either select images, business address, telephone and description individually, or click on the plus and minus symbol to add each option in order

Possible selections will be made known to the user through changes in the rollover state of each icon that is selectable (i.e. icons turn dark or cursor changes when rollover occurs)

If selected, would show closest ATMs, markets, mailboxes, and/or gas stations at the beginning and end of the path being traveled

**User Interface Design**
Default settings with no addresses entered: Images on, time set to afternoon

Print

**Options**

**Tools**

**From**

Address | Intersection | Business

City | State | Zip Code

*1pm*

**Departure Time**

**To**

Address | Intersection | Business

City | State | Zip Code

Images

Business Address

Telephone

Description

+

−
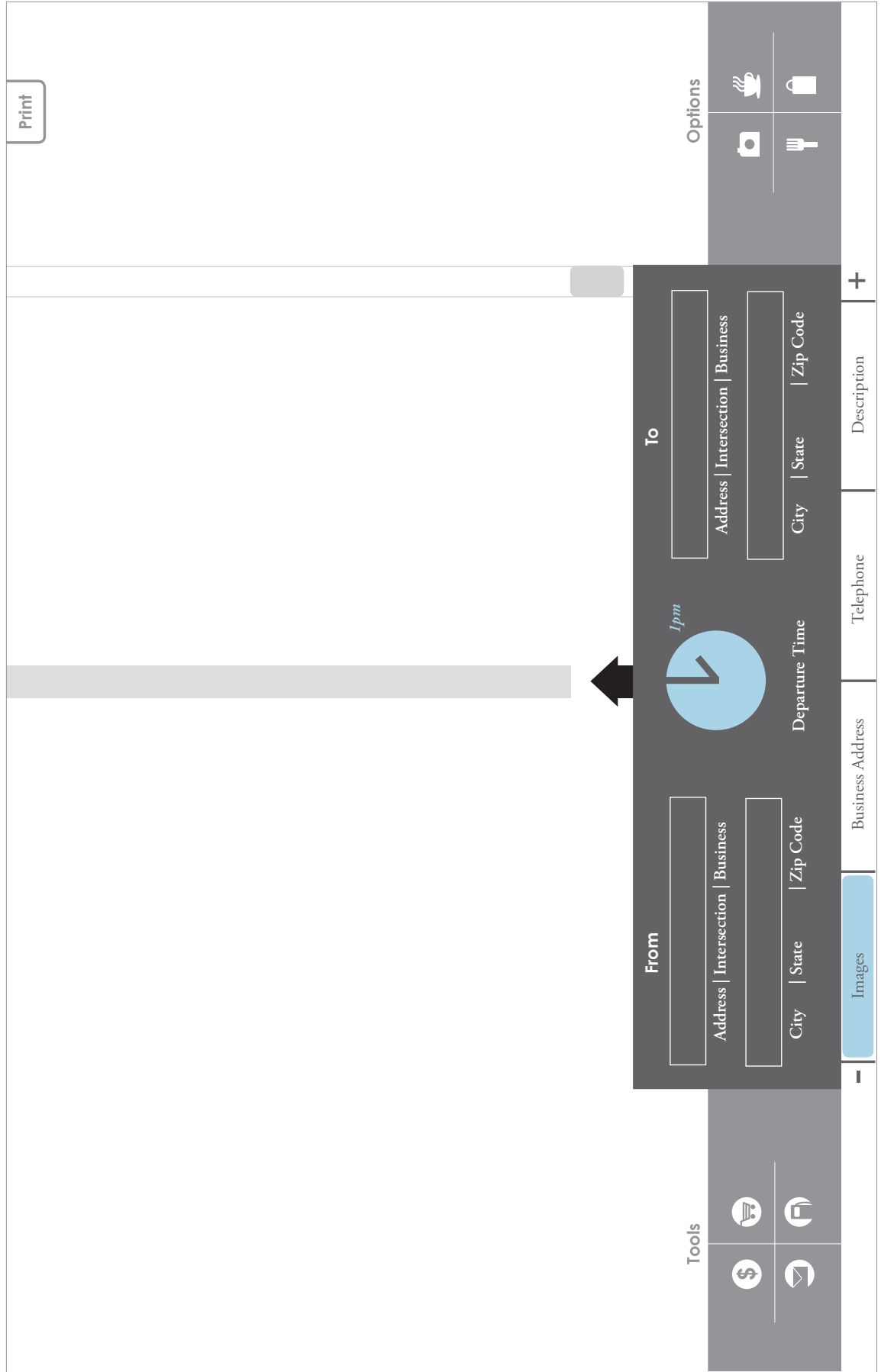
Site Navigation

The following pages feature a web sequence beginning with the home page, proceeding through a couple selections a user may make, and ending with the first page of the final printed path. Below, is a shorter sequence compiled on one page for the reader of this thesis documentation to see how the navigation would flow from one screen to the next.
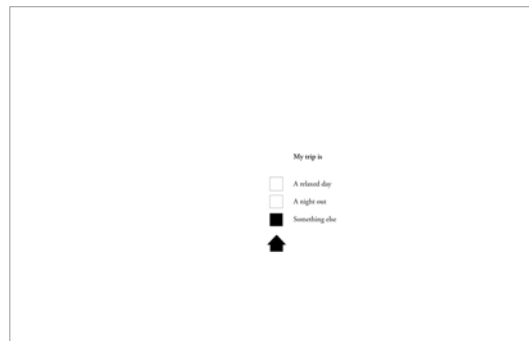


User selects "Something Else": *Enters default selections*
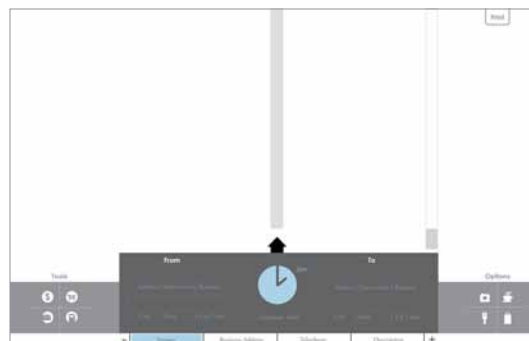


User enters default selections: *Images selected and time is set to afternoon*
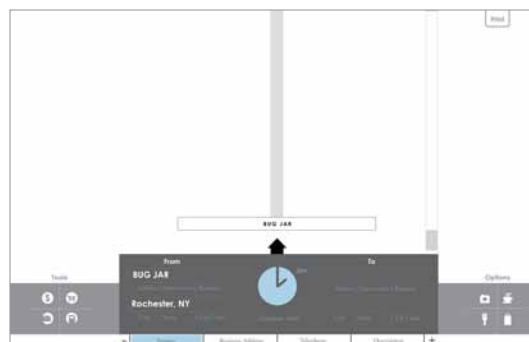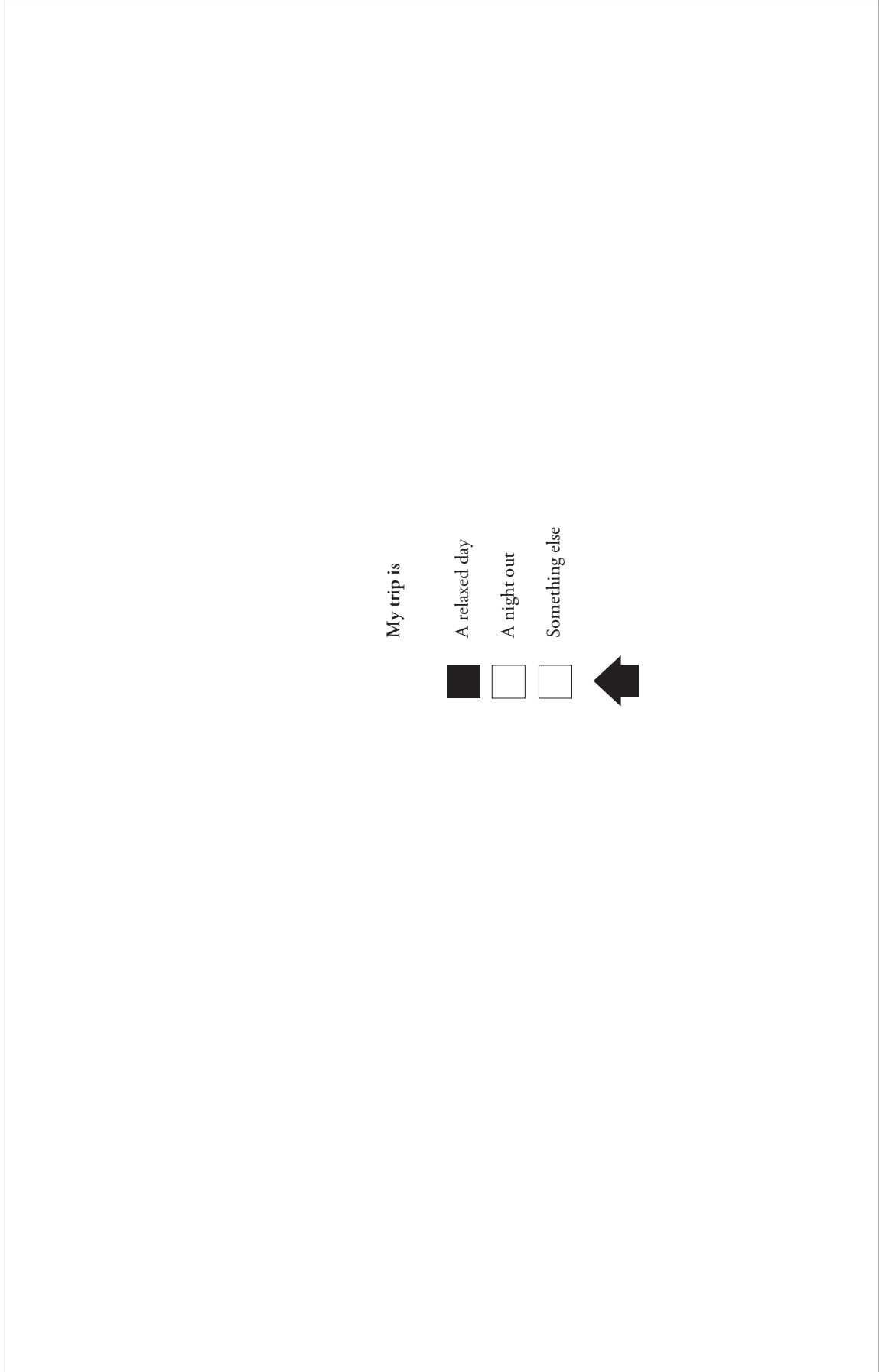


User enters "To" address: *Start location appears in customized driving direction area (above black arrow)*



User enters "From" address: *Driving direction set from start to end appears in customized driving direction area*

**User Input: Selects *A Relaxed Day***
This decision establishes settings that include images,
all options, and business addresses for each option

**My trip is**

A relaxed day

A night out

Something else

Shown here is the page with settings in response to the user selecting *A Relaxed Day*

**User Input: Enters *From* address**

After the user enters a starting address, the starting point appears as a text label at the beginning of the route

Print

Options

Tools

**From**

BUG JAR

Address | Intersection | Business

Rochester, NY

City | State | Zip Code

**To**

Address | Intersection | Business

City | State | Zip Code

Departure Time

*1pm*

BUG JAR

Description

Telephone

Business Address

Images
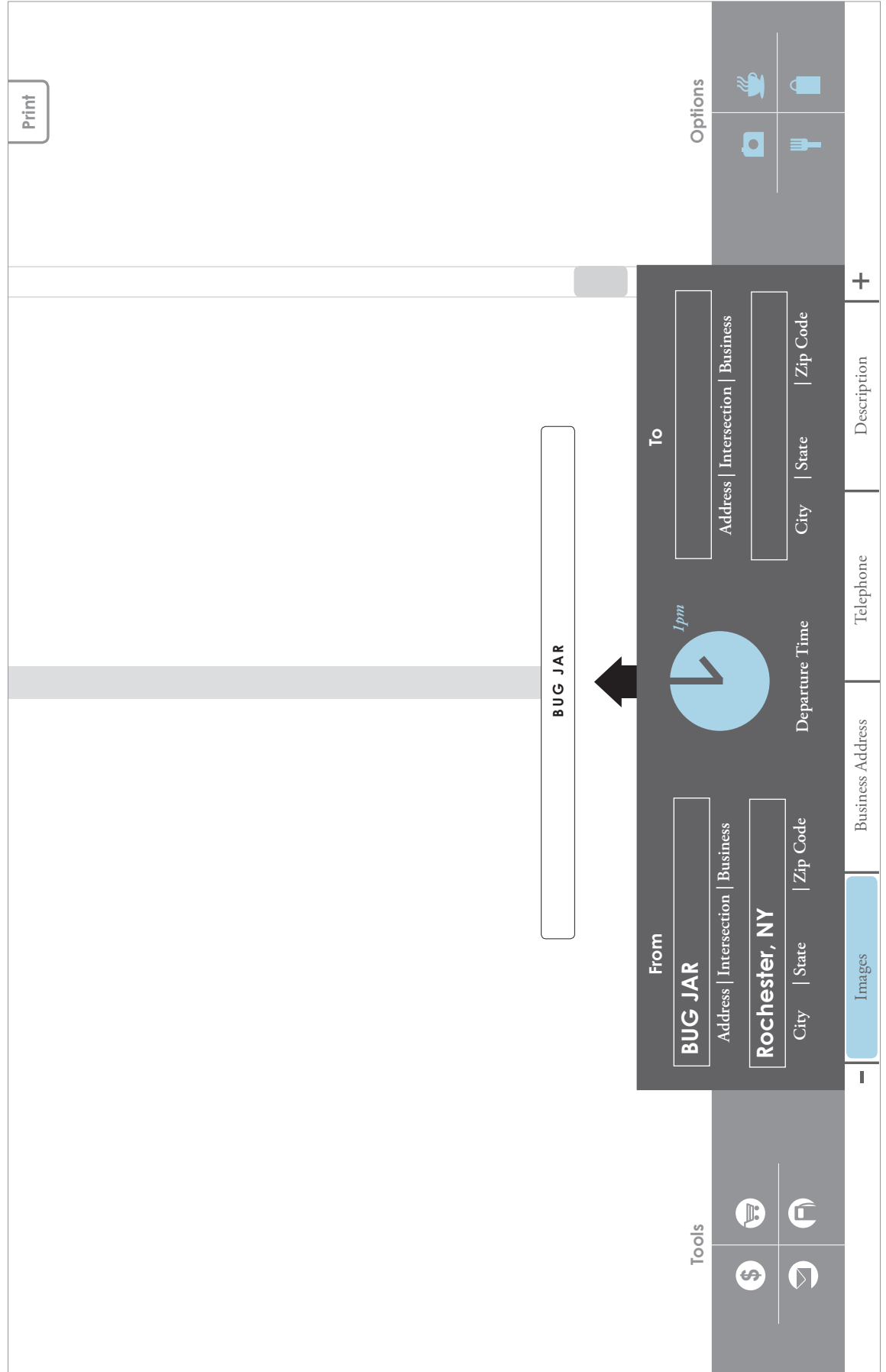
**User Input: Enters *To* address**

After the user enters both *From* and *To* addresses, the completed driving directions appear with user selections in effect



Tools

Options

Print

Little Theater
*240*

Spot Coffee
*200 East Ave*

R   **EAST AVE**

*1.6 Miles*

Manhattan Square Park
*Brown & Court St*

Strong Museum
*1 Manhattan Sq*

Damian's Pub
*81 Marshall St*

*1.4 Miles*

L   **MONROE AVE**

**BUG JAR**

**From**

BUG JAR

Address | Intersection | Business

Rochester, NY

City   | State   | Zip Code

*1pm*

Departure Time

**To**

GALLERY R

Address | Intersection | Business

Rochester, NY

City   | State   | Zip Code

Images   Business Address   Telephone   Description

**User Input: Deselects *Points of Interest* and *Shopping***
When tools or options are deselected they are taken away from the path

Print

Options

Tools

From

BUG JAR
Address | Intersection | Business
Rochester, NY
City | State | Zip Code

To

1pm

GALLERY R
Address | Intersection | Business
Rochester, NY
City | State | Zip Code

Departure Time

Business Address | Images

Telephone | Description | +

R CULVER RD                0.2 Miles

Spot Coffee
200 East Ave

R EAST AVE                1.6 Miles

Damian's Pub
81 Marshall St

L MONROE AVE

1.4 Miles

BUG JAR

IMPLEMENTATION
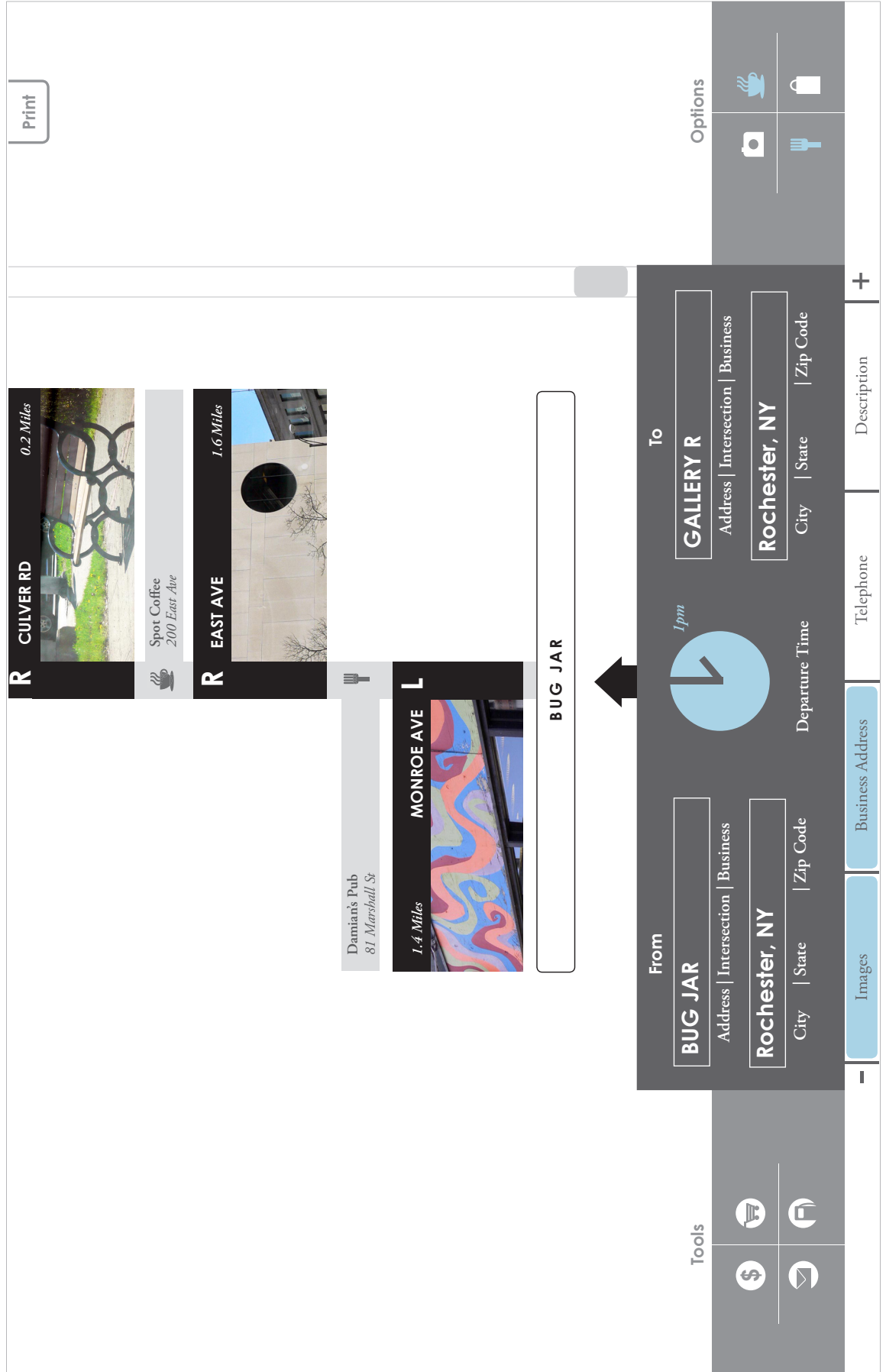
**Printed Results**
First page of the print version generated from the web sequence on pages 108-112

1

**Bug Jar → Gallery R**
3.3 Miles
10 Mins

**Gallery R → RIT**
8.1 Miles
21 Mins

*Restaurant*
*Coffee Shop*

GALLERY R

**R** PARK AVE — *0.1 Miles*

**R** CULVER RD — *0.2 Miles*

*Spot Coffee*
*200 East Ave*

**R** EAST AVE — *1.6 Miles*

*Damian's Pub*
*81 Marshall St*

**L** MONROE AVE — *1.4 Miles*

**L** PARK AVE — *1.1 Miles*

BUG JAR

START

# IMPLEMENTATION
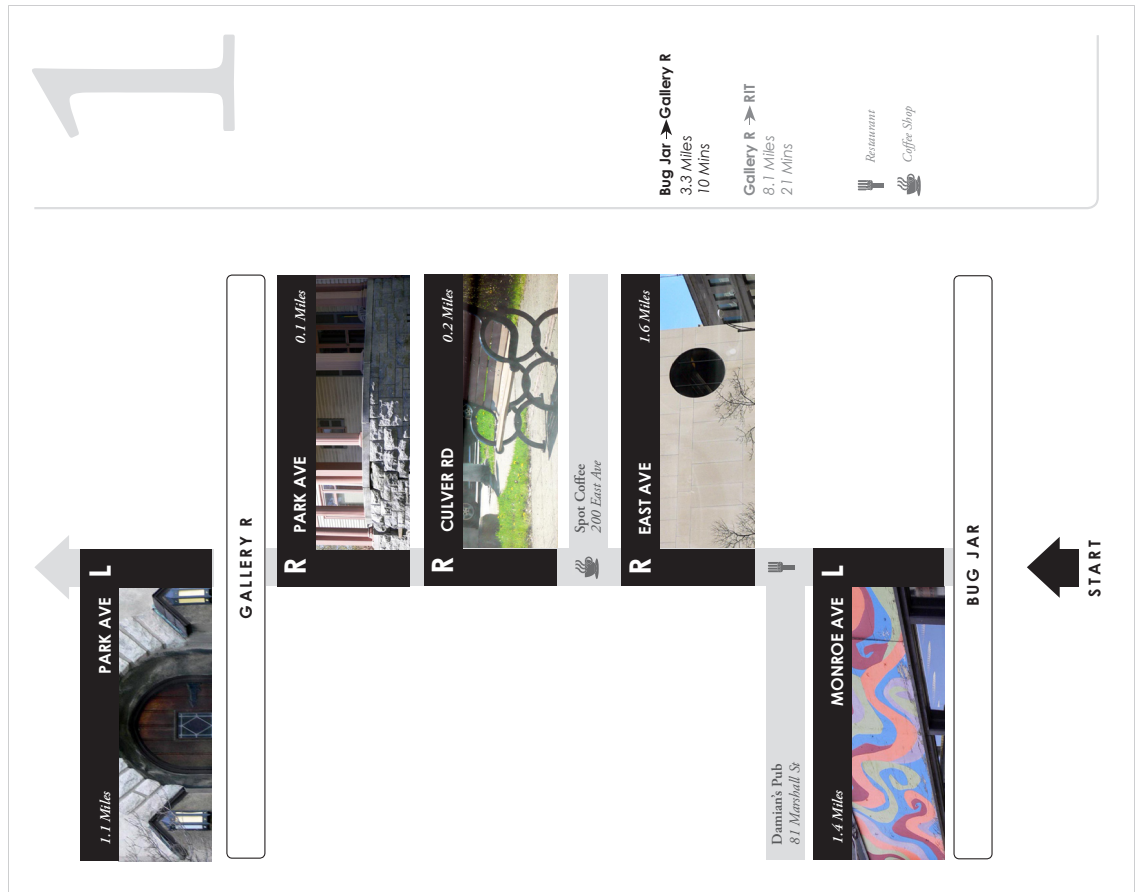
**User Input: Deselects *Images* and *Coffee Shops*, Selects *Restaurants***
After the first printout, the user decides to change his/her options and the resulting on-screen driving directions are seen here

Print

**Options**

**Tools**

**From**

BUG JAR

Address | Intersection | Business

Rochester, NY

City | State | Zip Code

**To**

GALLERY R

Address | Intersection | Business

Rochester, NY

City | State | Zip Code

Departure Time

1pm

Images | Business Address | Telephone | Description | +

**R** PARK AVE — 0.1 Miles

**R** CULVER RD — 0.2 Miles

George Eastman House
900

Rochester Museum & Science Center 647

Rochester Historical Society
485

Little Theater
240 East Ave

**R** EAST AVE — 1.6 Miles

Manhattan Square Park
Brown & Court St

Strong Museum
1 Manhattan Sq

Damian's Pub
81 Marshall St

1.4 Miles

**L** MONROE AVE

BUG JAR

**Printed Results**
First page of the revised print version generated from
the web sequence on pages 108-112 and 114

**0.7 Miles**  **ALEXANDER ST**  **L**

Jine's Restaurant
*658*

Magnolia's
*336*

Chester Cab
*707 Park Ave*

**1.1 Miles**  **PARK AVE**  **L**

**GALLERY R**

**R**  **PARK AVE**  *0.1 Miles*

**R**  **CULVER RD**  *0.2 Miles*

George Eastman House
*900*

Rochester Museum & Science Center
*647*

Rochester Historical Society
*485*

Little Theater
*240 East Ave*

**R**  **EAST AVE**  *1.6 Miles*

Manhattan Square Park
*Brown & Court St*

Strong Museum
*1 Manhattan Sq*

Damian's Pub
*81 Marshall St*

**1.4 Miles**  **MONROE AVE**  **L**

**BUG JAR**

**START**

**Bug Jar ➤ Gallery R**
*3.3 Miles*
*10 Mins*

**Gallery R ➤ RIT**
*8.1 Miles*
*21 Mins*

▣ *Point of Interest*
🍴 *Restaurant*

# DISSEMINATION

*Documentation of short-term and long-term distribution possibilities*

## MFA Thesis Exhibition

An exhibition held in the Bevier Gallery at the Rochester Institute of Technology is one way in which this thesis project has been disseminated. The exhibition was displayed for the general public from April 3-18 of 2007 and included the goals and research of this project. The exhibition used simple wayfinding devices of board and video games in order to direct visitors through the exhibit and to bring a level of interaction to the space. This exhibition not only helped inform the public of this project and new ways of thinking, but also helped the designer gain additional understanding through the reactions of the public.

The basis for the design of this exhibition was the key question of how a player travels into, through, and out of a game environment (see page 16-18). The answers discovered through research were implemented within the space. Visitors were introduced into the exhibition space with a representation of an arrow pointing towards the left. They were then led through the space by initiating a countdown mechanism. When visitors turned the corner, blocks of color served to envelop and transport them through to the other side of the exhibit. Below is an image of the starting point of the exhibit. To the left, from top to bottom, are images depicting a visual walk-through around the space in the intended sequence. Each individual panel layout appears in *Appendix D*.

**DISSEMINATION**

## Future Dissemination

Other ways in which this thesis can be disseminated are through symposiums and conferences that directly relate to this thesis topic.

## Symposium on Exhibit and Environment Design



**Society for Environment Graphic Design of cial web site, 2007**

One particular symposium that is directly related to this thesis is the Society of Environmental Graphic Design's (SEGD) *Symposium on Exhibit and Environment Design.* 2007's symposium is titled *New Directions: Affecting Thought and Changing Minds* held at Cranbrook Academy of Art from August 9-11. The content of this SEGD symposium relates to this thesis study because both deal with the portrayal of information through the creation of environments.

The *2007 SEGD Symposium* specif cally deals with a change in the world of exhibition design towards visitor experiences that combine narrative and environment, similar to this thesis project's research dealing with how board and video game environments can serve as influences on creating and recreating the built environment of a specif c community. This symposium's focus on how exhibit and environment design can af ect and change minds is in accordance with this thesis project's goal: using graphic design to influence how viewers perceive their environment and how they are af ected by these perceptions.

## DUX: Conference on Designing For User Experience



**Conference on Designing for User Experience of cial web site, 2007**

A conference that can help with the dissemination of this thesis is the DUX *Conference On Designing For User Experience*. In 2007, DUX chose to title the conference *Changing Roles and Shifting Landscapes.* The 2007 conference is about the adaptability of designers in a time when society's environment and landscape are changing and the ways in which designers are answering to technological change that af ects experience.

This thesis project is closely related to the content of this conference because the goals of this thesis are also to question and think about the designer's future role with a focus on how the digital landscape will cause changes in the way designers think and create. The f nal application for this thesis relates to one specif c instance where the digital world coincides with the physical world and how design elements can be used to bridge the two more successfully in a way that increases user experience in the physical world.

### Future Dissemination (Continued)

### The DX National Design Conference

Design Exchange's second annual *National Design Conference,* titled *Ourtopias: Ideal Cities and the Roles of Design in Remaking Urban Space,* is to be held in Toronto, Ontario from June 14-16 of 2007. This particular conference's main focus is on how design can affect the reconstruction of urban spaces. Issues regarding historic preservation, social responsibility, branding, zoning, and urban renewal all play a large part in this conference.

This thesis is related to this conference since they both deal with creating and recreating environments. The design application for this thesis was a project that aimed to renew or enhance an urban space in ways not directly associated with architecture or other physical means. Because this thesis may offer new ways of thinking outside the realm of physical means to restructuring an urban space, it could have offered an interesting contribution to this design conference.

### ACM Siggraph: Sandbox Symposium

The *Sandbox Symposium* is a two-day video game conference coordinated with the annual *ACM Siggraph Conference.* This symposium features speakers, panels, and paper submissions dealing with research on video gaming as a medium that impacts individuals and society. The *Sandbox Symposium* promotes critical thinking related to the technical, artistic, and social aspects of video game design.

The research for this thesis highlights different aspects of both board and video game environments as they pertain to graphic design. The thesis application then connects the research with how game design can affect new and innovative thinking towards an enhancement of the physical environment. The research and critical thinking included in this thesis documentation could be disseminated at the *Sandbox Symposium* since it directly relates to the Symposium's goals.

**Design Exchange Toronto, Ontario**

**Sandbox Symposium at Siggraph 2007
San Diego, California**

# RETROSPECTIVE EVALUATION

*Looking back and evaluating the challenges of this thesis application with the goal of revealing improvements and plans for the future*

## Self Evaluation

This section documents specific challenges encountered during the thesis application process. In order to pinpoint areas that could benefit from further development or refinement, a self evaluation of the application project and its successes and oversights is essential.

The evaluation for the final application strived to gain an authentic view from the general public. Although it succeeded in obtaining a test group that was suitable for examining the functionality and benefits of the application, there were questions left unanswered. This was not only because of the small size of the test groups, but mainly because after surveys were researched, it seemed that there were better ways to structure questions in order to gain more useful feedback from the test subjects. For example, open-ended questions were initially included in hopes that the generality of the questions would encourage individualized responses. However, in the end it seemed that the more specific the questions were, the more specific and helpful the feedback was. On the other hand, when looking back at the more specific questions that *were* included in the surveys, the terse answers left much to be desired. In conclusion, the questions that provided the best feedback were ones that seemed of interest to the test subject, in which the question was well-directed yet worded in ways that conjured intrigue, and inspired the test subject to comment beyond the basics. Although survey answers gained were helpful overall to this thesis, much time was spent translating the feedback into pertinent data and comparisons. It would have been advantageous to have improved the structure of each survey question.

Since the images that were included in the final application were an important part of the driving direction concept and design, the final design variations could have benefitted from an evaluation of what type of imagery would have best addressed the preestablished goals for this project. Time allowing, an improved image set could have been established and tested for effectiveness. Some examples of options include direct or indirect imagery, and formal or informal landmarks. Further advancements could also be made by attempting to improve the new physical print versions of the driving directions to match or exceed the physical functionality and usability of current printed driving directions; this could include considerations such as minimizing paper usage and/or simplifying color and layout for universal printer capability. Because the application is internet-based and therefore strives to reach a larger audience, detailed improvements of the physical print versions could lead to even wider participation.

## Future Steps

Advancements for the design application portion of this thesis project could include not only programming the actual web interface, but also producing different routes throughout the city of Rochester in order to further evaluate the effectiveness of the concept. Another possibility for further testing, and broadening the scope of the project, could be the design of the same procedures and goals customized for different cities.

In order to study the extent of the project's applicability, specific themes could be tested to see if any intentional or direct effects on a test subject can occur. For example, themes can include directing drivers towards routes that specifically highlight nature and outdoor recreation in a city or the commercial districts of a city. Through further testing and seeing whether this type of driving direction set can be directed for specific purposes, it can help supplement the importance of the design project's purpose and help a city or community enhance *particular* aspects in need of improvement.

# CONCLUSION

*Assessing the process and accomplishments of the*
*overall MFA thesis experience*

# C O N C L U S I O N

## Personal Reflections

Searching for the subject of this thesis was effortless because of the high level of personal interest attached to the topic. However, defining and narrowing down the topic was a sizeable challenge. In its initial stages, the thesis topic appeared to be structured in its definition; however, the true definition of the topic was not possible without the research, analysis, and synthesis that followed. If the scope of the thesis topic could have been defined more quickly at the beginning, an even more thorough research of the topic would have been possible.

Researching the topic was an exciting aspect of this thesis experience. The integration of old and new thought was one of the most stimulating parts of this study. Historical and contemporary information combined to form new concepts that were able to affect methods of creative thinking. Initial research was done in the arenas of board and video game design in order to study graphic design problem solving and how it may impact both physical and virtual environments. It was interesting to see how board and video games create and recreate so many different environments within the confines of space, whether it be a square piece of cardboard or a rectangular screen. Although such spaces are considered "empty playgrounds" that are entirely open for interpretation, no such space truly exists; therefore, it is captivating to have studied how such spaces have been reconfigured over and over while still retaining their intimacy and level of comprehension with their users. As suggested above, an earlier realization of the thesis topic would not only have aided the documentation and communication of this thesis, but would have also helped centralize the primary research that was necessary to both the topic and its application. Even though some research was done towards the implementation of the application itself, most of the research was geared towards influencing the conception of the application rather than the production of it. Since this thesis application dealt with the redesign of an existing tool, additional research time would have offered the designer an enriched understanding of past and current iterations of the tool, which may have led to a more comprehensive new design solution.

One of the most difficult tasks of this thesis project was formulating a relevant application direction. Various concepts for a project that would incorporate board and video game influences were considered and reconsidered. Many different application directions were considered and eliminated; this course of exploration was necessary to produce a meaningful final design application concept.

# CONCLUSION

## Closing Remarks

This thesis presents a topic and creative process that will surface and resurface for the designer in the future. The thoughts and ideas that came about through the research and analysis of one specific topic have produced a wealth of new ideas that apply to many different areas of study. It was interesting to see how such a narrow scope can provide such a broad range of ideas. No matter how fast or slow change is to arrive in the future, an extensive study of the past, present, and future of a specific topic is invaluable. Of further importance is the way in which past, present, and future intertwine to influence recreation and reinvention. This thesis experience established that extensive and detailed knowledge, regardless of the topic, is necessary in furthering the growth of a designer's thought process.

In the future, it is unknown what new types of space graphic designers will play a role in creating. Currently, it is important for graphic designers to cross over to work in the virtual world in order to provide virtual spaces with some of the visual communication decisions that continue to improve and enhance physical space. This thesis study went through a focused assessment of board and video game design which concluded that the cross-influences between the two were a worthwhile study to help graphic designers relate seemingly dissimilar topics to their own field. More importantly, this thesis takes into consideration the future of the graphic design profession and its roles in a future that is progressively amplifying the virtual environment.

It is noted by many that the internet is already endeavoring to bridge gaps among and between many different types of communities. Also observed by many is a new divide between physical and virtual spaces that has resulted from the internet. In order to produce changes that connect the physical and virtual worlds rather than support the loss of one to the other, an application was designed that attempts to bridge the two worlds. Graphic design decisions were implemented on current web driving direction layouts in order to cause drivers to become more aware of their physical surroundings while driving. The different paths that one can take while traveling to a destination can redefine a city's characteristics, spirit, and narrative. By identifying and using resources predominantly existing in virtual space, graphic design decisions made in the course of this thesis project were able to enhance the experience and understanding of actual physical spaces.

# GLOSSARY

# GLOSSARY

**Augmented Reality (AR)**  A form of computer research that combines the real world with computer generated data from the digital world, creating devices that overlay digital data on to physical environments (also known as *Mixed Reality*)

**Augmented Reality Gaming**  A type of video game that is derived from research done in augmented reality (see *Augmented Reality (AR))*, dealing with video games that composite live video imagery, typically involving a GPS satellite, with digital imagery

**Chasing Game**  A game, either board or video game, with the goal of a player being to chase or corner his/her opponent in order to win

**Console Game**  A video game that can only be played on a specific machine or system made particularly for the game; some examples include PlayStation, Nintendo, and Xbox

**Cyberspace**  A term coined by the science fiction writer William Gibson, referring to objects or identities that exist in between physical and virtual spaces

**Displacement Game**  A game, either board or video game, where the goal of a player is to strategically displace the position of his/her opponent in order to win

**Environmental Design**  The design of visual communication solutions for interior and exterior environments, focusing on functional or experiential needs of humans

**Exhibition Design**  Design of an interior or exterior environment that involves the display of information and artifacts (i.e. museum settings)

**Filmic Strategy**  Various ways in which film portrays aspects of real life within two-dimensional space through techniques of visual perception and optical illusion

**Gaming**  The act of playing for the purpose of winning, defeating an opponent, and/or experiencing different environments

**Gameplay**  The feedback between a player and a game including usability and how well a game interacts with its player and his/her actions during a game

**Heads-Up Display (HUD)**  A digital user interface element that superimposes auxiliary information over a game environment in order to cause the player to constantly be looking "up" at the environment (i.e. first person shooters)

# GLOSSARY

**Information Design**  The visualization or visual display of different types of data in an organized way that communicates with heightened clarity

**Ludology**  A form of thought that believes games are free from narratives and should only be analyzed by way of concept of play, interface, and other interactive details of a game rather than the narrative quality games may appear to have

**Mise En Scène**  A French theater and film term meaning "putting into the scene" that involves the visual arrangement and placement of objects placed within the frame of the stage or screen

**Mixed Reality**  A term interchangeable with "augmented reality" (see *Augmented Reality (AR)*)

**Narratology**  A form of thought that believes that games are strongly connected to narratives and are used as a storytelling medium; narratologists are in opposition to ludologists (see *Ludology*)

**Narrative**  An individual's interpretation of history, culture, and / or society that can be fictional or nonfictional

**Narrative Structure**  The structure in which a story or narrative (see *Narrative*) is told to a viewer or reader

**PC Game**  A video game that can be played using a personal computer

**Phenomenology**  The study of a philosophy that takes into consideration the development of human consciousness

**Pictogram**  A visual symbol that represents a concept or an object

**Puzzle Game**  A game, either board or video game, where the goal of a player is to solve a designed problem through different forms of experimentation

**Racing Game**  A game, either board or video game, where the goal of a player is to reach the end before his / her opponent finishes the game

**Role Playing Game (RPG)**  A category of games where a player assumes the role of a character and participates with other players toward the progression of a game's narrative

# GLOSSARY

Simulation
The realistic imitation of a system or a process, or a recreation of a preexisting system or process

Spatial
Of or relating to a set of dimensions that define spaces, surroundings or environments

Strategy Game
A game, either board or video game, where the goal of a player is to use strategic means in order to displace, corner and defeat his/her opponent

Synthesis
The combination of different elements and an explanation or organization of how they work together

Systems Design
A realm of graphic design that deals with the organization of elements in a coherent, unified way to heighten communication value through decisions related to concept, color, space, language, and typography

Temporal
Relating to the chronology and sequence of time and elements relating to time rather than space

Territory Game
A game, either board or video game, with the goal of a player being to obtain and conquer more territory than his/her opponent

Usability
The ease of functionality of a man-made object, tangible or intangible, and how well the object fulfills its goals

Urban Planning
The physical, cultural, social, and economical development and organization of physical environments

Video Game Console
A machine or system that plays specific formats of video games, some examples are PlayStation, Nintendo and Xbox

Virtual Reality
An environment that imitates reality through visual and sensory stimuli created by digital data

Visual Coding
Consistent use of design decisions to establish and strengthen connections between visual elements and their communication goals

Wayfinding
The orientation of a person within their physical space and the way in which they navigate through their surroundings

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# BIBLIOGRAPHY

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## APPENDIX A

*Expanded research findings:*
*Alton Delong Research Data*
*Relevancy of Information Design and Visual Perception*
*Examples of Augmented Reality*

## Alton DeLong Research Data

*Below is Alton DeLong's research data for the perception of elapsed time in scaled environments. DeLong's research shows that when people experience scaled environments, their perception of how much time has passed is relative to the scale they are interacting within. For example, when a person is asked to play within a board game environment that is a 1/4" scale, a 1/2" scale, and a 1" scale of the real environment, each test will show that the* perceived *elapsed time will be proportionally comparable to the* real *amount of elapsed time.*

### Elapsed time (T) associated with experiential duration (E) of 30 minutes in differently scaled environments. The compression ratio (CR) is T/E. S.E.M., standard error of the mean

| Condition | Model scale | N | | Elapsed time (min) (X ± S.E.M.) | Range | CR* |
|---|---|---|---|---|---|---|
| *Experiment 1 (unmasked)* | | | | | | |
| Single exposure | 1/6 | 20 | | 4.15 ± 0.630 | 1.73 to 13.83 | 1/7.23 |
| | 1/12 | 166 | | 2.52 ± 0.170 | 0.62 to 11.33 | 1/11.9 |
| Exposure to two | 1/12 | | | 2.64 ± 0.133 | 0.35 to 9.75 | 1/11.36 |
| scales (same sample) | 1/24 | 124 | | 1.57 ± 0.085 | 0.17 to 4.92 | 1/19.10 |
| *Experiment 2 (masked)* | | | | | | |
| Multiple exposures | | | | | | |
| same scale | 1/6 | 11 | 1 | 5.48 ± 0.619 | 1.00 to 8.15 | 1/5.47 |
| (independent samples) | | | 2 | 5.46 ± 0.561 | 1.28 to 7.37 | 1/5.49 |
| | | | 3 | 5.35 ± 0.501 | 1.55 to 7.42 | 1/5.60 |
| | 1/12 | 10 | 1 | 2.72 ± 0.417 | 1.35 to 5.47 | 1/11.03 |
| | | | 2 | 2.43 ± 0.453 | 1.33 to 6.17 | 1/12.34 |
| | | | 3 | 2.83 ± 0.531 | 0.68 to 6.87 | 1/10.60 |
| | 1/24 | 10 | 1 | 1.44 ± 0.247 | 0.42 to 2.78 | 1/20.83 |
| | | | 2 | 1.56 ± 0.312 | 0.37 to 3.72 | 1/19.23 |
| | | | 3 | 1.48 ± 0.255 | 0.45 to 3.05 | 1/20.27 |
| Exposure to three | | | | | | |
| scales | 1/6 | | | 3.85 ± 0.357 | 0.98 to 8.58 | 1/7.79 |
| (random order | 1/12 | 27 | | 2.60 ± 0.204 | 0.72 to 5.55 | 1/11.54 |
| same sample) | 1/24 | | | 1.55 ± 0.179 | 0.25 to 3.45 | 1/19.35 |
| *Experiment 3 (masked)* | | | | | | |
| Group F | | | | | | |
| Single exposure | 1/12 | 23 | | 2.89 ± 0.434 | 0.19 to 8.75 | 1/10.38 |
| Exposure to two | 1/12 | | | 2.44 ± 0.448 | 0.48 to 5.75 | 1/12.30 |
| scales (same sample) | 1/24 | 9 | | 1.46 ± 0.280 | 0.20 to 3.23 | 1/20.55 |
| Group A† | | | | | | |
| Single exposure | 1/12 | 32 | | 8.20 ± 0.635 | 3.85 to 18.2 | 1/3.66 |
| Exposure to two | 1/12 | 10 | | 7.36 ± 1.167 | 4.18 to 15.0 | 1/4.08 |
| scales (same sample) | 1/24 | | | 6.02 ± 1.58 | 2.78 to 18.75 | 1/4.98 |

*Theoretically CR should equal model scale [E = x(T)]; † Sample characterized by acoustic interference, internal auditory timing, or both.

# A P P E N D I X   A

## Relevancy of Information Design and Visual Perception



**Series of images for promotional use**
T e *Interpretation of Visual Motion*, Shimon Ullman
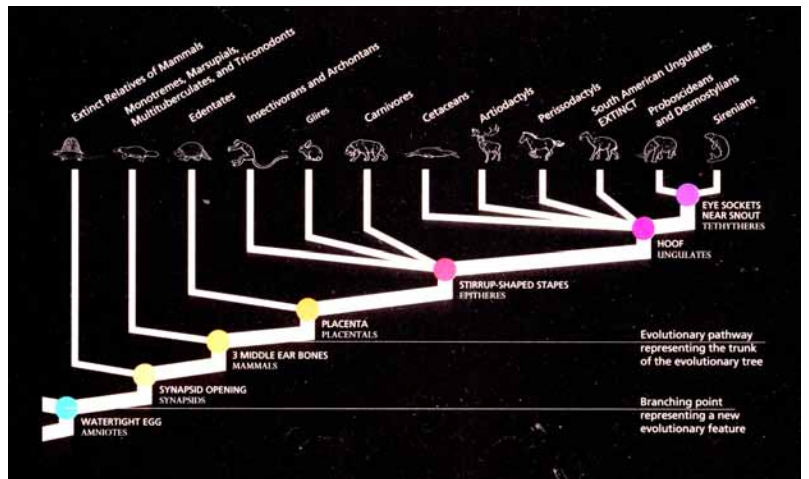


**Evolution exhibit map**
*Information Architects*, Ralph Applebaum
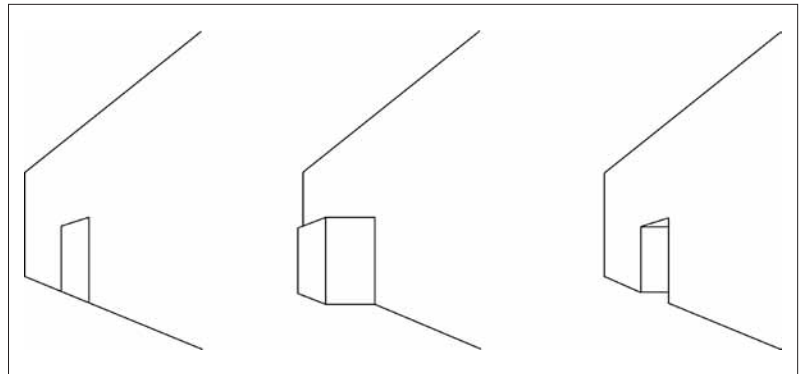


**Two-dimensional representations of entrances into spaces**
*Wayf nding: People, Signs, and Architecture,* Paul Arthur, Romedi Passini

4
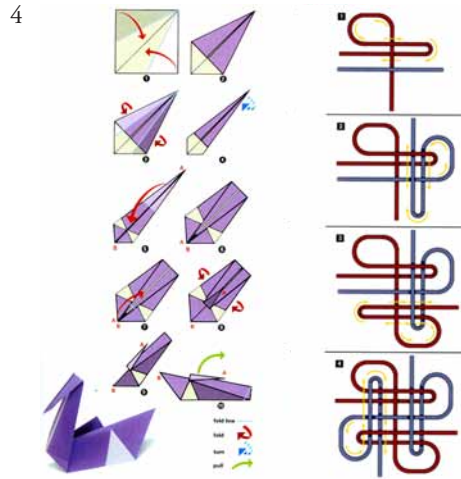


**Instructional diagrams**
Trevor Bounford

5
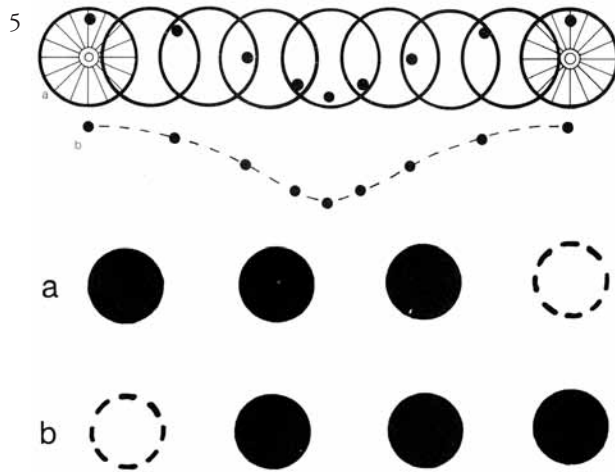


**Visual perception diagrams of movement**
*Principles of Visual Perception*, Carolyn Bloomer

6
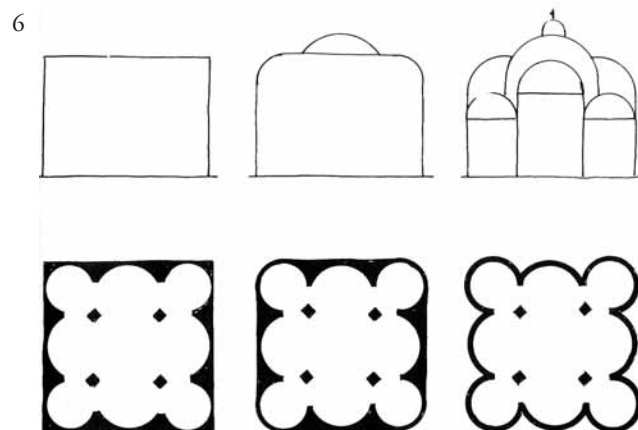


**How the shape of a building can help in the design of maps or symbols**
*Wayfinding: People, Signs, and Architecture,* Paul Arthur, Romedi Passini

7
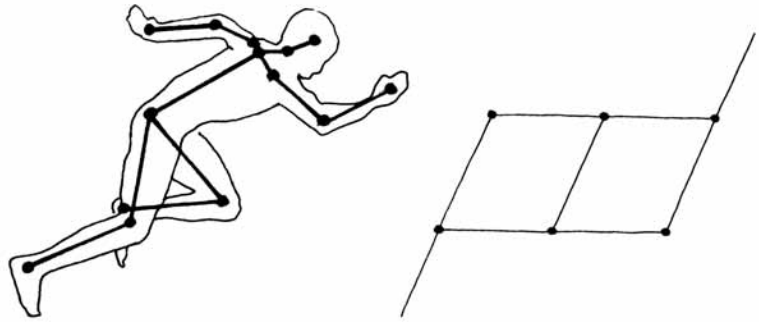


**Mapping a Gestalt circulation**
*Wayfinding: People, Signs, and Architecture,* Paul Arthur, Romedi Passini

8
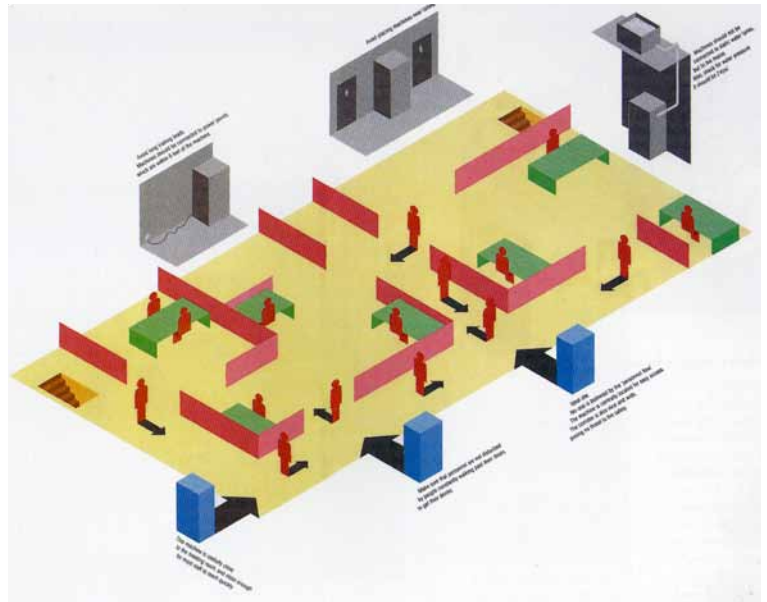


**Diagram of movement within an office environment**
*Information Graphics*, Craig Austin

**A P P E N D I X   A**

Examples of Augmented Reality

*Augmented reality used for video gaming*



**Augmented reality game,** *Invisible Train*
Daniel Wagner, Thomas Pintaric and Dieter Schmalstieg

*Augmented reality used for real-life navigation scenario*
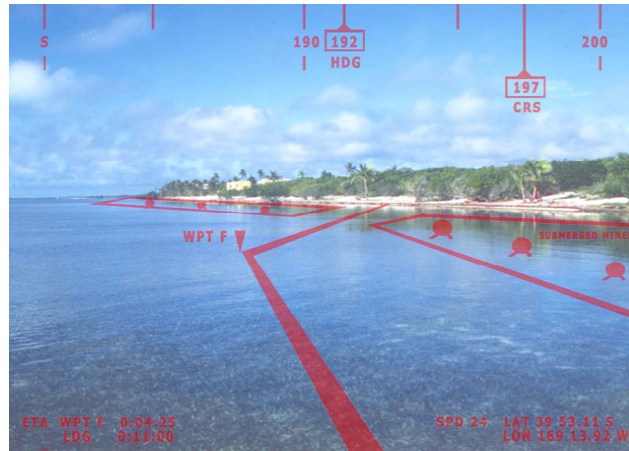


**Augmented reality aiding the navigation of a littoral zone (differing elevations of the coast of a bank of water)**
*Information in Place, Inc.*

# APPENDIX B

*Initial and intermediate driving direction sets:*

# APPENDIX B

## Design A
**Provided by** *Google*

**Google Maps**

Start **56 Lomb Memorial Dr**
**Rochester, NY 14623**
End **775 Park Ave**
**Rochester, NY 14607**
Travel **11.7 mi (about 21 mins)**

**56 Lomb Memorial Dr**
**Rochester, NY 14623**
Drive: 11.7 mi (about 21 mins)

| | | |
|---|---|---|
| 1. | Head **north** on **Lomb Memorial Dr** | 0.2 mi<br>1 min |
| 2. | At the traffic circle, take the **2nd** exit and stay on **Lomb Memorial Dr** | 0.3 mi<br>1 min |
| 3. | Turn **right** to stay on **Lomb Memorial Dr** | 443 ft |
| 4. | Turn **right** at **Jefferson Rd/RT-252 E** | 1.1 mi<br>2 mins |
| 5. | Turn **left** at **Brighton Henrietta Town Line Rd** | 1.1 mi<br>2 mins |
| 6. | Turn **left** at **W Henrietta Rd/RT-15** | 1.3 mi<br>3 mins |
| 7. | Turn **right** at **E River Rd** | 0.5 mi<br>1 min |
| 8. | Take the ramp onto **I-390 S** | 0.4 mi<br>1 min |
| 9. | Continue on **I-590 N** (signs for **I-590 N**) | 4.9 mi<br>5 mins |
| 10. | Take exit **5** to merge onto **I-490 W** toward **Downtown Rochester** | 1.4 mi<br>2 mins |
| 11. | Take exit **19** for **Culver Rd** | 0.2 mi |
| 12. | Turn **right** at **Culver Rd** | 0.3 mi<br>1 min |
| 13. | Turn **left** at **Park Ave** | 0.1 mi<br>1 min |

**775 Park Ave**
**Rochester, NY 14607**

These directions are for planning purposes only. You may find that construction projects, traffic, or other events may cause road conditions to differ from the map results.

Map data ©2007 NAVTEQ™

**Overview**



©2007 Google   Map data ©2007 NAVTEQ™

**Start**



Rochester Institute of Technology
©2007 Google   Map data ©2007 NAVTEQ™

**End**



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Map data ©2007 NAVTEQ™

Web  Images  Video  News  **Maps**  Gmail  more ▼

**Google** Maps

Start **775 Park Ave**
**Rochester, NY 14607**
End **Bug Jar**
**219 Monroe Ave**
**Rochester, NY 14607**
Travel **1.8 mi (about 5 mins)**

**775 Park Ave**
**Rochester, NY 14607**
Drive: 1.8 mi (about 5 mins)

| | 0.1 mi |
|---|---|
| 1. Head **east** on **Park Ave** toward **Brunswick St** | 0.1 mi |
| ➡ 2. Turn **right** at **Culver Rd** | 0.3 mi<br>1 min |
| ➡ 3. Turn **right** to merge onto **I-490 W** | 0.5 mi |
| 4. Take exit **18** for **Monroe Ave/RT-31** | 0.1 mi |
| ➡ 5. Turn **right** at **Monroe Ave/RT-31** | 0.9 mi<br>3 mins |

**Bug Jar**
**219 Monroe Ave**
**Rochester, NY 14607**

These directions are for planning purposes only. You may find that construction projects, traffic, or other events may cause road conditions to differ from the map results.

Map data ©2007 NAVTEQ™

**Overview**



©2007 Google   Map data ©2007 N

**Start**



©2007 Google   Map data ©2007 N

**End**



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Map data ©2007 NAVTEQ™

# A P P E N D I X   B

## Design B

| Utta Clutta | 121 Park Ave<br>Vintage knickknacks | ● |
| Parkleigh | 215 Park Ave<br>Specialty gift shop | ● |
| Jine's Restaurant | 658 Park Ave<br>Neighborhood diner | ◉ |
| Magnolia's | 336 Park Ave<br>10% student discount | ◉ |
| Lakeshore Record<br>Exchange | 370 Park Ave<br>Indie music source | ● |
| Chester Cab<br>Pizza | 707 Park Ave<br>Voted #1 pizza | ◉ |

**L** · 1.1 Miles · **Park Ave**

**GALLERY R** · 775 Park Ave · *RIT's art and design gallery*

**R** · **Park Ave** · 0.1 Miles

**R** · **Culver Rd** · 0.2 Miles

| ○ | George Eastman<br>House | 900 East Ave<br>Kodak founder |
| ○ | Rochester Museum<br>& Science Center | 647 East Ave<br>Science museum |
| ○ | Rochester<br>Historical Society | 485 East Ave<br>Museum and society |
| ○ | Little Theater | 240 East Ave<br>Indie film theater |
| ◎ | Spot Coffee | 200 East Ave<br>Coffee and live music |

**R** · **East Ave** · 1.6 Miles

| Manhattan<br>Square Park | Brown & Court St<br>City park | ○ |
| Strong Museum | 1 Manhattan Sq<br>Children's museum | ○ |
| Damian's Pub | 81 Marshall St<br>Pub fare | ◉ |

**L** · 1.4 Miles · **Monroe Ave**

**BUG JAR** · 219 Monroe Ave · *Live music and bar*

**START**

**1**

**ITINERARY**

**Bug Jar → Gallery R**
*3.3 Miles*
*10 Mins*

**Gallery R → RIT**
*8.1 Miles*
*21 Mins*

**RECOMMENDATIONS**

◉ Restaurant

◎ Coffee Shop

○ Point of Interest

● Shopping

© Carolyn Hsu

**ITINERARY**

**Bug Jar → Gallery R**
*3.3 Miles*
*10 Mins*

**Gallery R → RIT**
*8.1 Miles*
*21 Mins*

| | | |
|---|---|---|
| ○ | **Lamberton Conservatory** | *171 Reservoir Ave*<br>*$2 admission* |
| ○ | **Highland Park** | *155-acre park*<br>*One of the oldest parks* |

**R  Reservoir**   *0.2 Miles*

| | | |
|---|---|---|
| **The German House** | *315 Gregory St*<br>*Culture society* | ○ |
| **Abner Cole Walking Timeline** | *Walking timeline of*<br>*free education advocate* | ○ |
| **:nook** | *685 South Ave*<br>*Retro modern gifts* | ● |
| **Godiva's** | *653 South Ave*<br>*Vintage clothing reseller* | ● |
| **Open Face** | *651 South Ave*<br>*Sandwich eatery* | ◉ |
| **Cheesy Eddie's** | *602 South Ave*<br>*Cheesecake bakery* | ◉ |

*1.1 Miles*   **South Ave  L**

| | | |
|---|---|---|
| **Dashen Ethiopian Restaurant & Bar** | *503 South Ave*<br>*Ethiopian food* | ◉ |
| **Boulder Coffee** | *100 Alexander*<br>*Coffee and snacks* | ◎ |
| **Hot Dog Stand** | *Alexander & Monroe*<br>*Open daily* | ◉ |

*0.7 Miles*   **Alexander St  L**

**RECOMMENDATIONS**

◉ Restaurant

◎ Coffee Shop

○ Point of Interest

● Shopping

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**3**

**RIT** — *56 Lomb Memorial Dr*
*University*

**Lomb Dr** **L**

**R** **Jefferson Rd** *1.1 Miles*

**R** **Brighton Henrietta TL** *1.1 Miles*

| | | |
|---|---|---|
| **Seoul Garden** | *2805 W. Henrietta $* *Korean lunch specials* | ◉ |
| **Movies 10** | *2609 W. Henrietta* *$1.75 movies* | ○ |
| **Jay's Diner** | *2613 W. Henrietta* *10% student discount* | ◉ |
| **Pakistan House** | *2411 W. Henrietta* | ◉ |
| *$$* | | |
| **Empire Comics** | *1176 Mt. Hope Ave* *Comics/graphic novels* | ● |
| **Mt. Hope Cemetery** | *Walking tours* *Sa. 1p, Su. 2, 2:30p* | ○ |

*2.8 Miles* **Mt. Hope Ave** **L**

**RECOMMENDATIONS**

◉ Restaurant

◎ Coffee Shop

○ Point of Interest

● Shopping

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APPENDIX B

## Design C

**Bug Jar**



**L**

**Monroe Av**
*1.4 miles*

*Damian's Pub*

*Strong Museum*

*Manhattan Square Park*



**L**

**East Av**
*1.6 miles*

*Spot Coffee*

*Little Theater*

*Rochester Historical Society*

*Rochester Museum & Science Center*

*George Eastman House*



**R** **Culver Rd**
*0.2 miles*



**R** **Park Av**
*0.1 miles*

**Gallery R**
*At Park Ave & Brunswick St*

| START | Gallery R | END | RIT | TRAVEL TIME | 8.1 miles |
| --- | --- | --- | --- | --- | --- |
| | 775 Park Av | | 56 Lomb Memorial Dr | | 21 mins |

**Gallery R**

**L**



**Park Av**
*1.1 miles*

*Utta Clutta* Vintage gifts

*Parkleigh* Gift Shop

*Jine's* Restaurant

*Lakeshore Record Exchange*

*Magnolia's Deli / Cafe*

**L**



**Alexander**
*0.7 miles*

*Dashen Ethiopian Restaurant & Bar*

*Boulder Coffee*

*Hot Dog Stand*

**L**



**South Av**
*1.1 miles*

*The German House* German language/culture society

*Abner Cole Timeline* Public art

*:nook* Modern gifts and decor

*Godiva's* Clothing reseller

*Open Face Deli*

*Cheesy Eddie's Bakery*

**R**



**Reservoir Av**
*0.2 miles*

*Highland Park*

*Lamberton Conservatory*

**L**

**Mt. Hope Av**
*2.8 miles*

Jay's
Diner

Pakistan
House Restaurant

Mt. Hope
Cemetery
Weekend
Tours

Movies 10
$1.75
screenings
everyday

Empire
Comics

**R** **Brighton Henrietta TL**
*1.1 miles*

**R** **Jefferson Rd**
*1.1 miles*

**RIT**
*At Jefferson Rd & Lomb Dr*

FREDERICK DOUGLASS MEMORIAL SQUARE

# APPENDIX B

**Design D**

**① L** Monroe Ave (1.4 m)

**② L** East Ave (1.6 m)

## DESTINATIONS

**A** **Gallery R**
775 Park Ave
585.242.9470
Th-Fr. 2pm-6pm
Sa-Su. 1pm-5pm

**B** **RIT**
56 Lomb Dr

## RECOMMENDATIONS

📷 *Entertainment*

🍴 *Restaurant*

☕ *Coffee Shop*

🛍 *Shopping*

### Column ①



🍴 **Damian's Pub**
81 Marshall St.
F-Sa. 4p-2a
Pub fare



📷 **Strong Museum**
1 Manhattan Sq
M-Th. 10a-5p
F. 10a-8p
Sa. 10a-5p
Su. 12p-5p
International
museum of play



📷 **Manhattan Square Park**
Brown St. and
Court St.
Park with concert
stage and fountain,
seasonal ice rink

### Column ②



☕ **Spot Coffee**
200 East Ave
M-Th. 6a-11p
F. 6a-12a
Sa. 7a-12a
Su. 7a-11p
Local hangout
with occasional
live music



📷 **Little Theatre**
240 East Ave
Showing
independent
and foreign
films in limited
release



📷 **Rochester Historical Society**
485 East Ave
M-F. 10a-3p
Rochester's
oldest
surviving
museum



📷 **RMSC**
647 East Ave
Seasonal
Hours.
Science
museum,
planetarium,
and herb
garden



📷 **George Eastman House**
900 East Ave
T-W. F-Sa.10a-5p
Th. 10a-8p
Su. 1p-5p
Home of
Kodak founder

**3**

**A**

**R** Culver Rd (0.2 m)

**Gallery R (0.1 m)** *Park Ave & Brunswick Ave*

## DESTINATIONS

**(A)** **Gallery R**
775 Park Ave
585.242.9470
Th-Fr. 2pm-6pm
Sa-Su. 1pm-5pm

**(B)** RIT
56 Lomb Dr



**Gallery R**
775 Park Ave
Th-F. 2p-6p
Sa.-Su. 1p-5p
RIT's own
gallery of art
and design

## RECOMMENDATIONS

*Entertainment*

*Restaurant*

*Coffee Shop*

*Shopping*

**4**  **L**  Park Ave (1.1 m)

**5**  **L**  Alexander St (0.7 m)

## DESTINATIONS

**(A)** **Gallery R**
775 Park Ave
585.242.9470
Th-Fr. 2pm-6pm
Sa-Su. 1pm-5pm

**(B)** RIT
56 Lomb Dr

## RECOMMENDATIONS

📷  *Entertainment*

🍴  *Restaurant*

☕  *Coffee Shop*

🛍  *Shopping*



**Chester Cab Pizza**
707 Park Ave
Su-W. 11a-9:30p
Th. 11a-10:30p
F-Sa. 11a-11:30p
Voted #1 Pizza in Rochester



**Lakeshore Record Exchange**
370 Park Ave
M-Sa. 10a-9p
Su. 12p-5p
Indie and alternative music source



**Magnolia's**
336 Park Ave
M-Th. 10a-9p
F-Su. 10a-10p
Deli and cafe
10% student discount
$



**Jine's Restaurant**
658 Park Ave
M-Sa. 7a-10p
Su. 7a-8p
Neighborhood diner
$



**Parkleigh**
215 Park Ave
M-F. 10a-9p
Sa. 10a-6p
Su. 10a-5p
Everything from specialty coffee to stationery and tableware



**Utta Clutter**
121 Park Ave
Reseller of vintage knickknacks



**Hot Dogs**
Alexander and Monroe
M-F. 10a-4p
$



**Boulder Coffee**
100 Alexander
M-F. 6a-12a
Sa-Su. 8a-12a
$



**Corner Park**
Alexander Ave and South Ave
Great place to have lunch in the sun



**Dashen Ethiopian Restaurant/Bar**
503 South Ave
M-Su. 11:30a-10:30p
African DJ until 2am on Sat
$

**L** South Ave (1.1 m)

**L** Reservoir Ave (0.2 m)

## DESTINATIONS

**A** Gallery R
775 Park Ave
585.242.9470
Th-Fr. 2pm-6pm
Sa-Su. 1pm-5pm

**B** RIT
56 Lomb Dr

## RECOMMENDATIONS

*Entertainment*

*Restaurant*

*Coffee Shop*

*Shopping*

**Cheesy Eddie's**
602 South Ave
M-F. 8a-6p
Sa. 9a-4p
Bakery and specialty dessert
$

**Open Face**
651 South Ave
M-Sa.
11a-7p
Sandwich eatery
$

**Godiva's**
653 South Ave
W.Th.Sa.
12p-6p
F. 1p-7p
Vintage clothing reseller featuring $2 specials

**:nook**
685 South Ave
W. 11a-6p
Th-Sa. 11a-7p
Su. 12p-4p
Books, music and decor for the retro modernist

**Abner Cole Timeline**
A walking timeline on the life and times of Abner Cole, an advocate of free education

**The German House**
315 Gregory St
Provides information on German culture and language

**Highland Park**
155-acre park that began as a nursery and is one of Rochester's oldest parks

**Lamberton Conservatory**
171 Reservoir
M-Su.
10a-4p
Wide array of tropical flowers

**L** Mt. Hope Ave (2.8 m)    **R** Brighton Henrietta TL Rd (1.1 m)

## DESTINATIONS

**A** **Gallery R**
775 Park Ave
585.242.9470
Th-Fr. 2pm-6pm
Sa-Su. 1pm-5pm

**B** RIT
56 Lomb Dr

## RECOMMENDATIONS

📷 *Entertainment*

🍴 *Restaurant*

☕ *Coffee Shop*

🛍 *Shopping*



**Mt.Hope Cemetery**
Walking tours
Sa. 1p
Su. 2, 2:30p
Resting place of
Susan B. Anthony
and Frederick
Douglass



**Empire Comics**
1176 Mt. Hope Ave
M-Sa
12-6p
Most complete
collection of
graphic novels
in Rochester



**Pakistan House**
2411 W. Henrietta
M-Th.S. 11a-10p
F. 11a-11p
Su. 10a-6p
South Asian food
$$



**Movies 10**
2609 W. Henrietta
All shows $1.75
Tuesday's are
only $1 all day



**Jay's Diner**
2612 W. Henrietta
M-Su. 24 Hrs
12-4p
1950s diner
10% student
discount
$



**Seoul Garden**
2805 W. Henrietta
T-F. 11a-3p
Korean food and
BBQ lunch
specials daily
$

© Carolyn Hsu

**10**   **B**

**RIT**



## DESTINATIONS

**A** **Gallery R**
775 Park Ave
585.242.9470
Th-Fr. 2pm-6pm
Sa-Su. 1pm-5pm

**B** RIT
56 Lomb Dr

## RECOMMENDATIONS

📷 *Entertainment*

🍴 *Restaurant*

☕ *Coffee Shop*

🛍 *Shopping*

# APPENDIX C

*Final Design Application Solution*

**A P P E N D I X   C**

## Final Solution

**R**  **CULVER RD**  *0.2 Miles*



| | George Eastman House |
|---|---|
| | *900* |
| | Rochester Museum & Science Center |
| | *647* |
| | Rochester Historical Society |
| | *485* |
| | Little Theater |
| | *240* |
| | Spot Coffee |
| | *200 East Ave* |

**R**  **EAST AVE**  *1.6 Miles*



| Manhattan Square Park | |
|---|---|
| *Brown & Court St* | |
| Strong Museum | |
| *1 Manhattan Sq* | |
| Damian's Pub | |
| *81 Marshall St* | |

*1.4 Miles*  **MONROE AVE**  **L**



**BUG JAR**

**START**

**Bug Jar → Gallery R**
*3.3 Miles*
*10 Mins*

**Gallery R → RIT**
*8.1 Miles*
*21 Mins*

*Point of Interest*

*Restaurant*

*Coffee Shop*

*Shopping*

Dashen Ethiopian
*503 South Ave*

Boulder Coffee
*100*

Hot Dog Stand
*215 Alexander St*

*0.7 Miles*     **ALEXANDER ST**   **L**



Utta Clutta
*121*

Parkleigh
*215*

Jine's Restaurant
*658*

Magnolia's
*336*

Lakeshore Record Exchange
*370*

Chester Cab
*707 Park Ave*

*1.1 Miles*     **PARK AVE**   **L**



**GALLERY R**

**R**   **PARK AVE**     *0.1 Miles*



**Bug Jar → Gallery R**
*1.6 Miles*
*4 Mins*

**Gallery R → RIT**
*8.1 Miles*
*21 Mins*

*Point of Interest*

*Restaurant*

*Coffee Shop*

*Shopping*

Lamberton Conservatory
*171*

Highland Park
*170 Reservoir Ave*

**R** **RESERVOIR AVE** *0.2 Miles*



The German House
*315 Gregory St*

Abner Cole Walking Timeline
*661*

:nook
*685*

Godiva's
*653*

Open Face
*651*

Cheesy Eddie's
*602 South Ave*

*1.1 Miles* **SOUTH AVE** **L**



**Bug Jar → Gallery R**
*0 Miles*
*0 Mins*

**Gallery R → RIT**
*6.3 Miles*
*13 Mins*

*Point of Interest*

*Restaurant*

*Coffee Shop*

*Shopping*

**RIT**

**R**   **JEFFERSON RD**    *1.1 Miles*



**R**   **BRIGHTON HENRIETTA TL** *1.1 Miles*



Seoul Garden
*2805*

Movies 10
*2609*

Jay's Diner
*2613*

Pakistan House
*2411*

Empire Comics
*1176*

Mt. Hope Cemetery
*791 Mt. Hope Ave*

*2.8 Miles*    **MT. HOPE AVE**   **L**



**Bug Jar ➔ Gallery R**
*0 Miles*
*0 Mins*

**Gallery R ➔ RIT**
*5 Miles*
*10 Mins*

*Point of Interest*

*Restaurant*

*Coffee Shop*

*Shopping*

# APPENDIX D

*MFA Thesis Exhibition Panels, April 3-18 2007*

# TRAVELING THROUGH
# THE ABSTRACT
# ENVIRONMENT

## Graphic Design
## Contributions to
## Game Environments

Board games and video games unfold information to their players in new environments; environments with which players may have no direct relationship to such as historical and futuristic settings, or environments that are fabricated from fairy tales and imagination. The choices involved in the development of such environments are essential to the successful transfer of information between game and players, as well as from player to player. How do players travel through these constructed environments? How do these constructed environments reveal information and encourage comprehension throughout the game? Strategies related to navigation and visual coding are keys to providing an entrance, a passage, and an exit to any environment, real or abstract.

Just as the history of games has evolved from tangible game environments such as board games, to intangible game environments such as video games, the real world has also been constructing a crossover from real space to digital space through the Internet. Converting real businesses to online storefronts or turning archives of printed articles into online databases are a few examples.

Through research and analysis of how graphic design contributes to the conceptual environments in board games and video games, a further understanding of using visual means to create and navigate through other new environments will be achieved. This knowledge will be useful in the transfer of environmental components from real space to digital space.

Carolyn Hsu
Graduate Graphic Design MFA Program

Different case studies, exhibits, and concepts appear here as influences and precedents to this thesis study. These examples have led to the research of graphic design influences on creating abstract environments in both physical and virtual worlds.

Columbine shooting reimagined as a video game John Haddock



Sketches of Science City New York, NY



American McGee's Alice Electronic Arts

## TOURIST CITIES

Tourist cities, such as the themed environments of casinos in Las Vegas, NV, and the themed environment of Disney World in Orlando, FL, depict fantasy and desire, translating them into a physical environment. Places like the ones mentioned above merge imaginary environments into real life, with real surroundings and actual people. Players of a game are similarly immersed in a board or video game through the design of the game's environment. Dennis Judd and Susan Fainstein of *The Tourist City* write, "A city that tries to build an economy based on tourism must project itself as a *dreamscape of visual consumption*. People expect to experience heritage, architecture, and culture that make up a city's essence. A construction of any version of a city's heritage requires large doses of *mythology, folk memory, and popular fantasy*."

## FICTIONAL WORLDS, VIRTUAL EXPERIENCES

*Fictional Worlds, Virtual Experiences* was an exhibition held at the Cantor Center for Visual Arts featuring the work of John Haddock, a video game designer who recreates real-life events such as "Tank Man," the anonymous man who went up against tanks at the Tiananmen Square protests of 1989, and the Columbine High School shooting of 1999, as seen above. Haddock's work shows visual translations of and has imagined, environments that society knows of and has imagined, but has never been able to experience in time and space. It is interesting to note that such real-life scenarios, which have been ingrained into society's cultural knowledge, must look similar to what the media had originally shown to society. Visual elements, such as angles and perspectives of well-known images documenting a historical event, are often imitated to bring immediacy to the player and to prompt cultural memory.

## SCIENCE CITY EXHIBITION

*Science City* (Chermayeff & Geismar) is an outdoor installation that was to be installed in New York City. The installation exemplifies the relationship between non-fictional and fictional environments. Although it is intended to create an imaginary "museum" out of the real-life city, it is also intended to blend its components with its surroundings to create a believable environment, one that is different yet recognizable by the typical passerby. This project is a physical example of combining two familiar environments, the city and the museum, to create a new environment, the *Science City*.

## GAME DESIGN AS NARRATIVE ARCHITECTURE

An article by Harry Jenkins titled *Game Design as Narrative Architecture* speaks of *American McGee's Alice* (Electronic Arts), a video game interpretation of Lewis Carroll's *Alice's Adventures in Wonderland*. Jenkins analyzes how new environments are created in video games by recreating already familiar spaces such as Alice's Wonderland. By studying environments created out of preexisting conventions one can see how new, conceptual environments are made to incorporate common knowledge among its players. Jenkins forms the idea that fictional environments are essentially "manipulations of environmental details," as opposed to environments built from the ground up.

Studies beyond the realm of board and video game design were researched in order to create connections between the graphic design of games and its significance to other important areas of study. Research was conducted in the following areas: Urban planning, interior design, storyboarding, and architecture in film.



*Integrated mass transit system*
*Curitiba, Brazil*

## URBAN PLANNING & SOCIETAL IMPACT

Both urban planning and game design deal with the construction of a world with respect to the needs of a society. Seeing how urban development and planning solve problems dealing with societal needs can create a better understanding of how to find design solutions that answer to the needs of a game's players. This can be seen in the book *Massive Change*, by Bruce Mau, which includes an interview with Jaime Lerner, an urban planner for Curitiba, Brazil. Lerner speaks of how the needs of society aided him in the design of Curitiba's mass transit system which is considered one of the best examples of urban planning to date. Because the real environment is what brings culture and memory to society, one must look to the construction of a true environment in order to build a brand new one. The development and planning that goes into bringing up a city should be studied in order to effectively construct any type of believable environment that invites a person to become engaged in it, whether it is abstract or real.
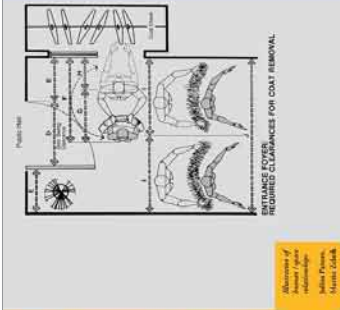


*Illustration of human / space relationships*
*Julius Panero, Martin Zelnik*

## INTERIOR DESIGN

The design of interior spaces offers a different arena of interaction compared to the design of exterior spaces such as architecture and urban planning. Interior design looks into the differences that should be addressed in designing the "exterior" and "interior" environment of a game; the exterior being the construction of the environment that all players are exposed to, and the interior being the elements of the game that belong to each individual player alone. The design of "interior" items take on a different role, they are directed to the individual or team, not to the entire arena of opposing players. "Interior" design of a game environment can include any objects, clues, or information that the player obtains for his purposes, and not his opponent's.

The scope of interior design is for a select amount of people, causing the degree of interaction and intimacy to differ from its exterior counterparts.



*Understanding Comics*
*Scott McCloud*

## STORYBOARDING & SEQUENCING

By studying the techniques of storyboarding or visual sequencing as seen in comic books, one is able to see ways in which other mediums that function in two-dimensional formats portray time and motion. All game environments, whether board games or video games, can be dissected into panels of information for the player. Segregating "panels" of a game and studying them through the lens of a storyboard or comic book artist can lead to the successful integration of a narrative and its visual structure. Through visual techniques introduced in *Understanding Comics* by Scott McCloud, such as the one shown above, the dissemination of information and narrative throughout a game can be "timed." Timing in a game then suggests motion, which will move the player from point A to point B as directed by its creator. This can be helpful in providing the designer of a game more control over the paths and outcomes a player will experience.



*The Spadena House used for many film sets*
*Beverly Hills, CA*
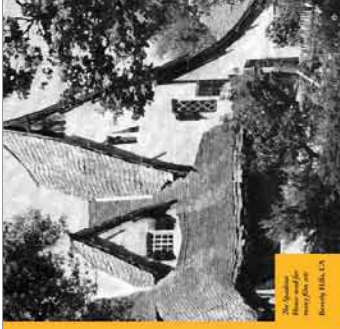


*Set design by Mr. Blandings British Ella Dream House*
*Los Angeles, CA*

## ARCHITECTURE IN FILM

Films use architecture to create the emotional and cultural setting of an environment they are attempting to portray. An article by Joseph Rosa titled *Tearing Down the House*, looks at how cultural references are built into a film through architecture. Rosa observes that "the traditional home became ever more entwined with notions of domestic bliss," while on the other hand, "[t]he penthouse was typically reserved for the wealthy, older, well-educated, and unsentimental." Above are examples of pieces of architecture used in films. These houses characterize two different lifestyles and cultures.

How does graphic design help lead a player into, through, and out of an abstract environment?

Key questions such as these act as the foundation for a focused analysis of board and video games. The following examples introduce the analysis of the above question.

*Tzaar*
Rio Grande Games

*Super Mario Bros.*
Nintendo

*Lumines*
Ubisoft

## INTO

One way a player is introduced to a new environment is by starting a countdown mechanism. Once the idea of time enters and is activated, the player is given a clear signal of when gameplay will begin. This helps transfer a player immediately into the arena of a game through the competitive and aggressive nature that the notion of passing time instigates. The game *Tzaar* uses a series of hourglasses as game pieces. The start of the game is marked by turning over each game piece in order to establish a beginning. Introducing a countdown mechanism is similar to signaling the beginning of a race with a gunshot. It is a fast and clear indication of initiation and brings the attention of the player towards the direction of the game.

Within this exhibit, a countdown mechanism was activated in order to mark entry into the environment as well as establish a sequenced path of travel as the panels of the exhibit led visitors to the environment's exit. With the use of numbers as graphic symbols representing units of time, the panels were tabbed sequentially with a countdown to the culmination of the exhibit space.
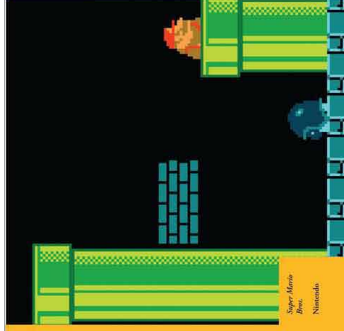
## THROUGH

After introducing a player into a game, how does graphic design continue a player's travels *through* the game environment? Traveling through a game environment may involve the containment of a player in a systematic symbol of a "vehicle." This helps a player travel through a game by creating successful transitions throughout an abstract environment that never allow the player to visually or conceptually exit the environment.

For example, in the *Super Mario Bros.* series, if the player ever needs to be transported from one place to another, this is done by jumping into green pipes and "warping." Using a consistent visual symbol such as a green pipe for transport, alongside the concept of warping from one place to another through water pipes, helps keep the player within the game environment at all times.

The current area of this exhibit serves as an example of containing the visitor at all times. This red hallway encapsulates the viewer and provides for a visual transportation device, enhancing the transition from one side of the exhibit panels, to the other side to come. In addition, the rhythmic use of color throughout this exhibit creates a paced form of travel throughout the space.
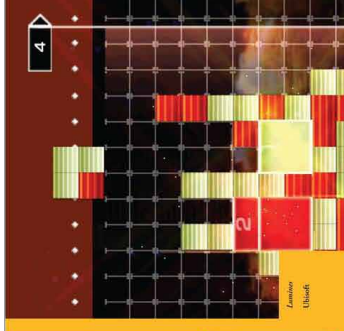
## OUT

For many video games, the boundaries of the game's environment are not defined visually, affording the idea that the environment of the game extends infinitely. Still, other games create visual boundaries in order to provide for a visual cue to exit out of the game. Above is the video game *Lumines*. There are clear boundaries indicated by the gridded area where gameplay is to occur. As bricks stack up, they get closer and closer to the top edge of the grid or "game board." Once these bricks hit the top line and exit the boundaries, gameplay has ended. Anytime the player is outside of the visual boundary, they have "exited" the game. The inclusion of a visual boundary serves as a simple, effective way to quickly bring the player out of the game environment.

At the beginning and end of this exhibit, the visitor will find a visual boundary drawn by blocks of color. These blocks draw a visual boundary for this space. The red blocks below the number "1" form a boundary at the end of this exhibit around the corner. The blocks of color show visitors where this space ends, just as the blocks of color at the start of this exhibit had signaled where this space began. This visual signal exemplifies how the above analysis is used to form an exit for this particular environment.

## CATEGORIZING TYPES OF GAMES

A comparative matrix was generated in order to have a visual overview of different categories of games. It is important to be able to place games in categories defining the type of game it is in order to understand the context of each game. The different types of games are differentiated by the players' end goals. For example, according to this matrix, *Chess* is a "Strategy by Placement or Displacement" game. This is because the purpose and goal of the player is to create disorder to his opponent's strategy by blocking his opponent's pieces or taking over spaces occupied by his opponent. Included here is an example from the comparative matrix. The set of games highlighted here are chosen for their heightened comparisons between each other.

|  |  | Puzzle | Racing | Space or Territory | Chasing and Cornering | Strategy by Placement | Role Playing | Good Example of: Motion | Space | Time |
|---|---|---|---|---|---|---|---|---|---|---|
| Board Game | Clue | • |  |  |  |  | • | • | • | • |
|  | Cityscape |  | • | • |  | • |  |  | • |  |
|  | Go |  |  | • | • |  |  | • | • | • |
|  | Chess |  |  |  |  | • |  |  | • | • |
|  | CarSh n'Gon$ |  |  |  |  |  | • |  | • | • |
| Video Game | Brain Age | • |  |  |  |  |  |  |  | • |
|  | Animal Crossing |  |  |  |  |  | • |  |  | • |
|  | Civilization Series |  |  | • |  |  | • | • | • | • |
|  | Contact |  |  | • | • |  | • | • | • | • |
|  | Final Fantasy Series |  |  |  | • |  | • | • | • | • |

## ORGANIZING STRATEGIES

Richard Saul Wurman's Organizing Hatracks is a method of organizing elements by category, time, location, alphabet and magnitude. These principles and formats of organization were used by Wurman as a means of creative process for his design work. Seen below are examples of how information and analysis of the selected board and video games can be organized by location, time, and magnitude. This organizational method is helpful in making new discoveries through unexpected comparisons.

**Richard Saul Wurman's Organizing Hatracks**

| Arrangement | Purpose |
|---|---|
| *By Location* Place where game is / can be played (from online, to indoor, to outdoor, etc.) | The interaction of games with surrounding environment(s) |
| Location of game environment from the ground to the sky | The degree of abstraction of a game environment compared to its level of location |
| *By Time* Earliest to latest time period game portrays | Together, these two ways of organizing data shows connections between the time period a game is trying to portray, compared to the time period it was produced in |
| Earliest to latest time period game was popularized | |
| *By Magnitude* Lowest to largest number of environments included in game | This aids in further studies between complexity of games incorporating less environments versus more |
| Most enclosed space to most vast area covered within game | How small / large conceptual spaces are interpreted given the same amount of real space |

## DESIGNING GAME COMPONENTS

Presenting an abstract environment to a viewer involves a balance of attention paid to the narrative of the game, the navigational system it adopts, how it disperses information to the viewer, and how well-developed the characters are. When dealing with these four traits of a game, it is necessary to understand the degree to which graphic design affects each aspect. The area comparison below represents to what extent each of the four aforementioned game components affect the graphic design of a game's map or interface.

By studying the individual parts of a game that require graphic design, one can see which considerations are more important than others when designing certain parts of a game. Beneficial design decisions can be derived about the crucial elements of a map or interface, leading to a more directed goal.



Graphic Design of Maps / Interface
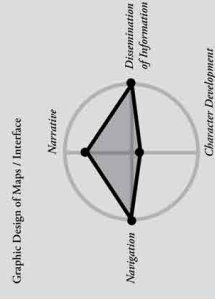
## APPLICATION IN PROGRESS

How can one space be transformed again and again through the use of graphic design? How does one's experience through a space change when different factors affect a person's travels? What differences should designers take into consideration when designing for new environments and different modes of travel such as traveling through the physical world versus traveling through cyberspace?

*Application*

The final application for this study involves creating a visual, handheld guide through a select well-known space using information design and wayfinding. The ideas of time, space, and motion as it pertains to gaming, will be implemented throughout the experimental piece using graphic design. The application will include experimentation dealing with the transformation of environments, as well as the changes that need to be made to graphic design elements when taking into consideration different modes of transportation. Different modes of transportation will be studied, pertaining to how one travels in a physical environment (board games), as opposed to a virtual one (video games), with regards to each environment's specific modes of transportation such as walking, running, biking, or flying. This application will view the difference between physical and virtual environments as two different ways a person can travel through an abstract environment.

*Process*

The physical space to be used will be one existing in Rochester, NY, and the virtual space will be a select environment existing within the virtual environment *Second Life*. Mirroring the real world, *Second Life* is an online environment in which its visitors not only visit locations in virtual space through the use of an avatar, but are also responsible for the construction of the virtual environment. This makes *Second Life* a good comparison to the physical world.

*Goal*

The main goal of this application will be to reinforce design's ability to transform environments and spaces, and to study the different considerations that need to be made when designing for the physical world in contrast to the virtual world. Through the use of studies done on graphic design contributions in both board and video game design, this application will attempt to manipulate familiar environments within a physical space and a virtual space. This application will seek to only use graphic design such as wayfinding and information design to change or influence the emotions, feelings, and thoughts a person will have on a specific space.

By conducting this application, new comparisons can arise from evaluating the different experiences people will collect. Whether traveling through a physical building, or through the internet, graphic design can influence and manipulate each experience.

## METHODS OF EXPERIMENTATION

The chart below shows different ways in which this application may be conducted. Initial planning and preliminary testing will be performed for each possible experimentation method in order to seek out the most beneficial one to fully conduct.

| Constant | Possible Variables |
| --- | --- |
| Path | Start / End Point |
| | Mode of Travel |
| | Timing / Speed |
| | Tasks to Complete |
| Start / End Point | Path |
| | Mode of Travel |
| | Timing / Speed |
| | Tasks to Complete |
| Mode of Travel | Path |
| | Start / End Point |
| | Timing / Speed |
| | Tasks to Complete |
| Timing / Speed | Path |
| | Start / End Point |
| | Mode of Travel |
| | Tasks to Complete |
| Tasks to Complete | Path |
| | Start / End Point |
| | Mode of Travel |
| | Timing / Speed |



*Durand Eastman Park*
Rochester, NY



*Orientation Island*
Second Life
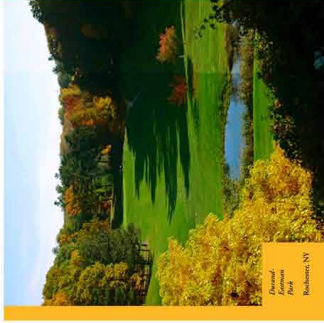
## PHYSICAL LOCATION

This project will take an open, physical space in Rochester, NY and "overlay" several variations of abstract environments onto the space through the use of graphic design as a means of directing the test group. The graphic design elements will not be imposed on the physical environment, but only on the traveler being evaluated and will serve as a mental superimposition.

*Image courtesy of James Bóse*
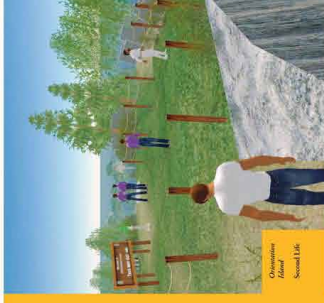
## VIRTUAL LOCATION

In order to study and evaluate this project's effects on a virtual space, locations will be selected from the online world *Second Life*. The graphic design elements that were designed for the physical environment (see *Physical Location*), will then be implemented in the same way onto a virtual space. The differences between the degree of control these elements have while traveling through a physical space, as opposed to a virtual one, will be studied.