

IMMERSIVE REALITIES

design lessons from the virtual world



CREDITS

Allison Ong
Masters of Landscape
Architecture Candidate at
University of Washington

Advisory Committee

Thaisa Way
Jeff Hou





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David Fletcher, Matt Slemon, Annie Bai, Alexander Pagliere, Eric Nevala, David Grafstrom, Luke Hegeman, Steve Messick, Monica Taylor, Daniel Birman

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TABLE OF CONTENTS

	Introduction	i
	How To Use This Handbook.....	ii
	The Future	iii
	Think Like a Game Designer	iv
	Wayfinding Tools And Techniques	1
	Introduction.....	2
	Examples from Games	3
	Application.....	4
	Case Studies	12
	Environmental Storytelling	14
	Introduction.....	15
	Examples from Games	16
	Application.....	17
	Case Studies	23
	The City As A Sandbox	25
	Introduction.....	26
	Examples from Games	27
	Application.....	28
	Case Studies	33
	Sidequests	35
	Introduction.....	36
	Examples from Games	37
	Application.....	39
	Case Studies	43
	Conclusion	45

Can real places be fun to explore the way video game places are?



INTRODUCTION

Since the original 8-bit games of the 80's, video games have moved beyond classification as simple entertainment. Modern video games are works of art that use story and environment to involve the player in creating memorable experiences. The success of the video game industry depends, in part, on a comprehensive understanding of how to design environments that enable meaningful, emergent, experiences.

Designers of the built environment often have similar design goals to video game designers such as beauty, circulation, or sense of place. However, their imaginations are limited by real-world constraints like physics, budgets, clients, stakeholders, weather, building codes, etc. While the design professions have more recently focused their efforts on sustainability, resiliency, and environmental justice, the video game industry has strengthened their skillset to design the player's experience.

Many of the tools and strategies used by video game designers can be implemented in the built environment. These tools could help designers focus on creating immersive experiences in the real world.

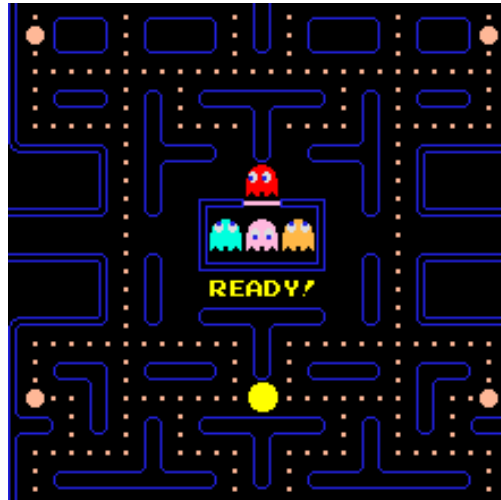


Image: Pacman (Namco) and Super Mario Bros (Nintendo) came out in 1980 and 1985 respectively. (top left and right) From Fair use, <https://en.wikipedia.org/w/index.php?curid=533608> and <https://en.wikipedia.org/w/index.php?curid=1034440>. The environments in The Witcher III (CD Projekt Red), released in 2015, have been praised for their beauty and realism.

How To Use This Handbook

Video game environments are often exciting, intriguing, delightful, puzzling, and engaging! They're places where thousands of people spend billions of hours. This handbook is intended to inspire designers of the built environment to refocus on experience of place, by drawing on the approaches developed by video game designers. This handbook synthesizes findings from an extensive review of video game literature and informal knowledge, to bring such immersive experiences to the real world.

Each chapter is organized in a similar manner. The "Introduction" provides a brief explanation of the tool. "Examples from Games" show how that tool is used in video games. "Application" suggests real world situations where these tools would be most effective. "Case Studies" show real world examples of these tools in use.

The handbook begins with a focus on immediately applicable tools and progresses towards more abstract design theories. One way to think of this organization is by scale. The first chapter contains more site-scale tools while the later chapters introduce larger, city-scale ideas and theories.

"They [video game cities] are not troubled by commerce, or geography, or even inhabitants. The video game city will have but one reason to exist: to mean something within the player's experience."

-Jim Rossignol, "Cities in Video Games" in *Icon Magazine*, October issue 2011



Let's Go!

The Future

One goal for this research was to introduce landscape architecture to video games as a source of design precedents and inspiration.

Designers of the built environment have become exceptionally good at creating spaces that are beautiful and functional for people, weather, flora, fauna, and over time. Video game designers excel at crafting places that encourage emergent narratives, exploratory and playful behavior, risk-taking, and memorable experiences. By examining the processes and tools of another profession, designers of the built environment can learn to expand their thinking and challenge current modes of production.

Using these lessons in real-world spaces can influence public spaces to become more dynamic, engaging, and enjoyable. When public space is as entertaining as virtual space, a result could be that people spend more time outside engaging with each other, their environment, and their communities. I envision a future in which walking down the street can not only take me to the grocery store, but can also take me on an adventure.



Image: A video game landscape designed by landscape architecture firm Fletcher Studio. Image from *The Witness* (Thekla inc). Since completing this project, Fletcher Studio continues to use game design software for landscape designs.

Think Like a Game Designer

Following are some foundational ways video game designers design differently than designers of the built environment.

Who is the Audience?

Designers of the built environment often consider their audience's demographics when designing: age, profession, culture, hobbies, etc. Video game designers think of their audience as personality types: explorers, achievers, socializers, killers. Good designers try to have something for everyone in each environment while understanding that too much of one thing, is boring for everyone.

Let Them Decide

Player agency refers to the capacity for a player's decisions and actions to have meaningful consequences. When decisions result in different rewards, setbacks, or narrative outcomes, players will be engaged in their environment. Video games present players with choice, but not too many choices. Multiple choices can be stressful, while a single decision is exciting.

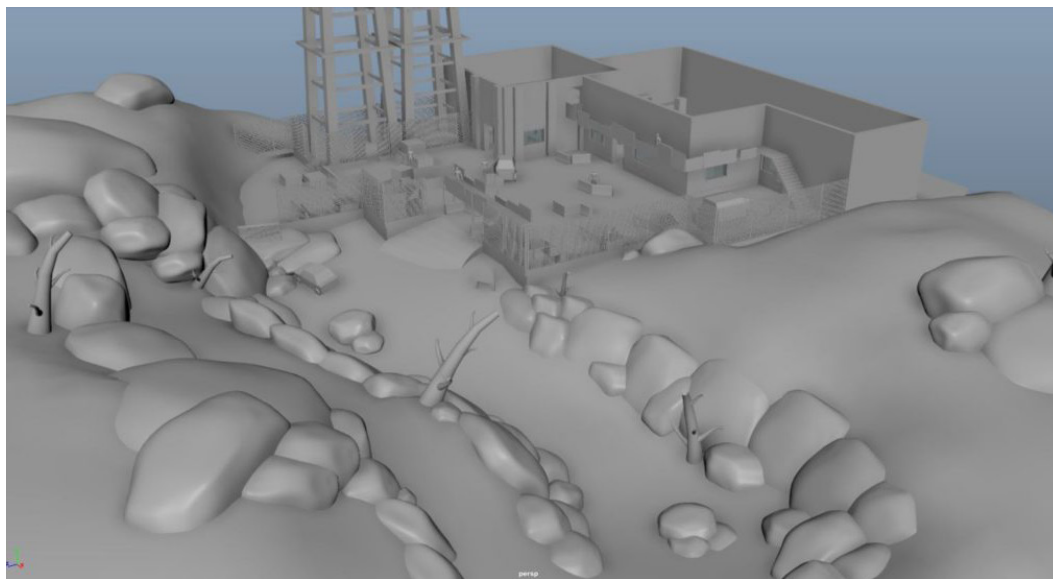


Image: A key stage of the process, 'greyboxing' is a simple 3D model of the space that allows designers to experience being in the space, make some changes, and try again. Image by Mike Barclay.

Pace Yourself

Video game designers pay attention to how much time elapses between points of interest, so the player won't get bored. Techniques in this handbook can be used in sequence, with attention to how time passes between each point of interest.

Put Yourself in Their Shoes

At every critical point in the environment (thresholds, vistas, nodes) video game designers place themselves in the player's shoes. They consider what the player sees, hears, feels, and what they will want to do next.

WAYFINDING TOOLS AND TECHNIQUES





Introduction

Have you ever felt lost in a new city or neighborhood, and then felt proud when you learned how to navigate on your own? Video game designers think of wayfinding as a quest, where finding one's way is both the challenge and the reward.

The process of finding one's way to a desired location is called wayfinding. Game designers use environmental cues to influence player's movements and actions, manipulating the player's experience of exploring the environment. Designers of the built environment use wayfinding to help people get from A to B. The main difference between wayfinding in games and in real life is that, in games, getting a little lost is part of the fun.

In many games, wayfinding tools such as GPS maps, dotted lines, or arrows can show the player exactly where to go. This type of wayfinding minimizes player agency. When the game tells the player what to do, the player is allowed to disengage. Immersive wayfinding tools engage the player's mind and senses in the act of navigation, culminating in a more fun and interactive experience.

“The real reward was the chance to engage my brain, to study the surroundings, and to follow clues instead of bread crumbs ... I want to be lead by my own curiosity, and not by a compass. I want to find interesting notes and follow scavenger hunts, but using my own powers of investigation. I want to see some interesting building over the horizon and just go see what fun treasures or stories can be found inside.”

- Mark Brown, from “Following the Little Dotted Line”
<https://www.youtube.com/watch?v=FzOCkXsYlQo>



Examples from Games

Uncharted 3 : The game *Uncharted 3* uses fine arts tools, such as **framing**, **lead lines**, **movement**, **sound**, **light**, and **color**, to subtly tell the player where to go. In one scene, the protagonist is pursued onto a balcony. There, two pillars frame a view to a roof. The rooftop appears as a line pointing towards the horizon. This image capture's the player's attention, and they run down the line of the rooftop.

Just then, a few birds take off to the right, directing the player's attention to another escape route. Later, the player encounters a series of window sills that are painted bright yellow. The yellow contrasts with to the colors around it, attracting the players attention. Knowing that climbing on window sills is a function in the game, the player traverses along the yellow sills.

In this scene, the player feels like they are making each navigational decision on their own. However it is the player's environment that is actually telling them where to go.



Image: Screenshots of *Uncharted 3*, from Mark Brown's video "Why Nathan Drake Doesn't Need a Compass". https://www.youtube.com/watch?v=k70_jvV0cGO

Application

“From the beginning, we perceived the island as a fundamental tourist experience. We sought out to create an engaging, beautiful, strange, and memorable experience...The experience of the island should be one enriched by wonder, even if one never solves a single puzzle.”

-David Fletcher, Landscape Architect for The Witness (Thekla Inc.) in an interview with the author.

Greater numbers of people are choosing to navigate using google maps. While paying attention to their phones, they notice less about their surroundings. Video games have similarly relied on GPS maps, dotted lines, and floating arrows to tell players where to go. However, more games are shifting towards immersive wayfinding, using the environment to show players where to go. Immersive wayfinding turns navigation into an engaging part of play.

This type of wayfinding is ideal for people looking to get to know a place, seeking authentic experiences, or an adventure. These wayfinding tools would be best suited for dense, touristic areas, where getting a little lost in your surroundings can be part of the fun.



Image: Rainier Beach Wayfinding Signs, photo by Oran Viriyincy (left). Wayfinding sign in the City of Adelaide, by Studio Binocular (right).

Application

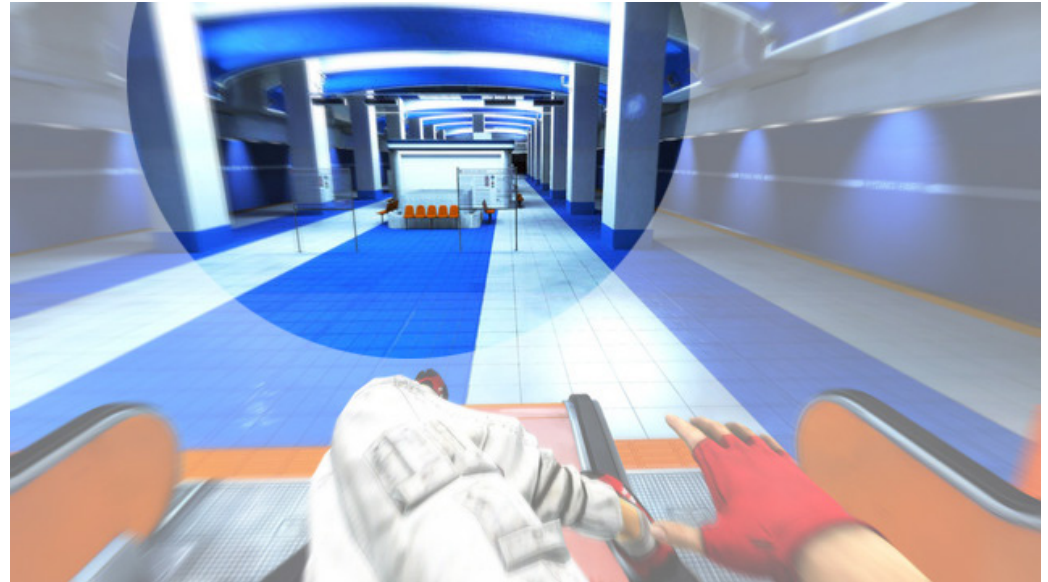
1 Lead Lines & Framing

Lead lines are a term used in fine art to describe a line that leads into a scene (typically a painting). Our eyes naturally follow lead lines, directing our attention.

Framing describes the use of two of the same objects such as columns, trees, buildings etc. to frame an area they want the player to pay attention to. The eye is drawn to the center of the frame drawing the player's attention.

2 Color

Many games choose one or two colors to consistently highlight things they want the player to see. *Mirror's Edge* uses red, *Uncharted* uses yellow, and *Tomb Raider* uses white. In these games, parkour and chase scenes are key elements of gameplay. Color is used to highlight doorways, platforms, or ladders to be used in parkour sequences. The player quickly gets used to looking for this color subconsciously.



Application

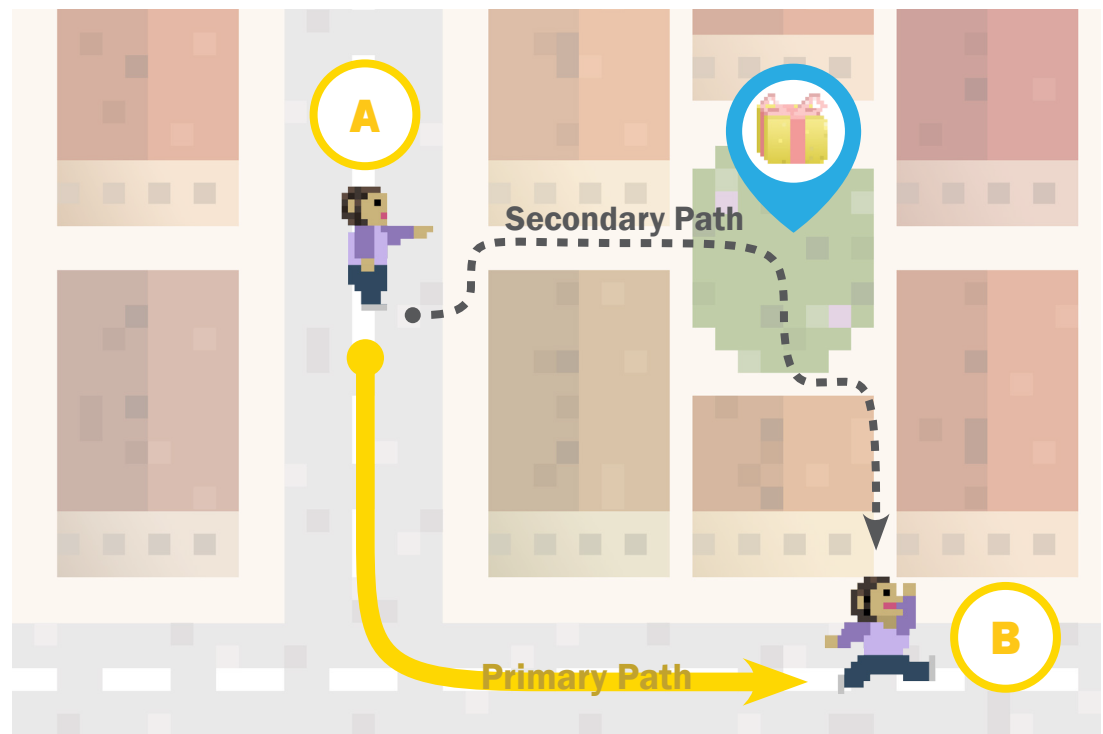
“I want to encourage players to explore, so if they move off the beaten path, it’s a conscious decision on their part, but they know the central point of interest in the scene.”

- Eric Nevala, Designer at Wobbly Duck, in an interview with the author

3 Primary & Secondary Paths

The fastest way from A to B is a straight line. But what is the most fun or memorable way from A to B? Video games provide navigational variety through primary and secondary paths. Primary paths are clearly marked (using color, scale, signage, lighting, materials, etc.), reassuring players that they will arrive at their destination. Knowing they may easily return to the primary path, players have the confidence to take a risk and explore secondary paths.

Video game designers use rewards to create incentives for players to explore secondary paths. Rewards can take the form of experiences, objects, people, narrative reveals, or items. Real life rewards might be art, views, exciting experiences, natural features etc. Offering the choice to take secondary paths adds depth, variety, and excitement.

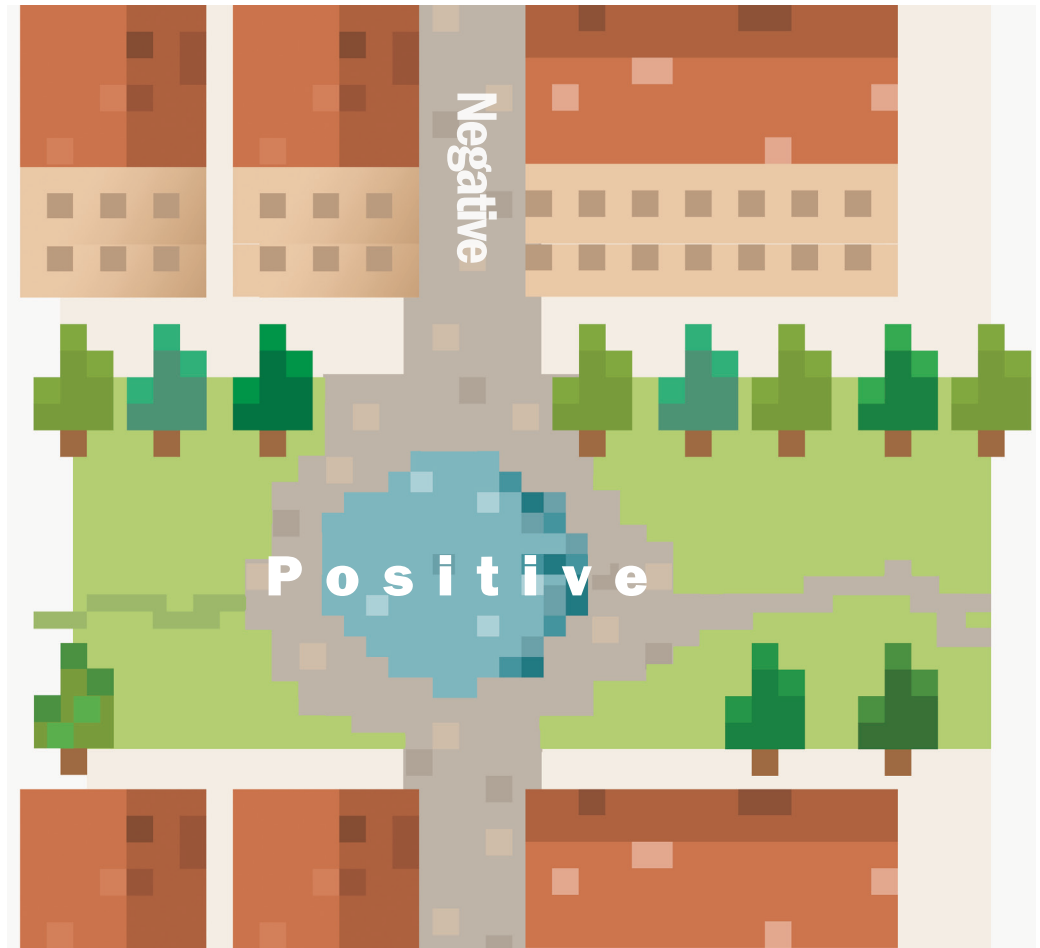


“Walking around the UW campus recently was inspiring for design. The negative spaces encourage you to move along until arriving at a positive space, where I was more likely to stop and look around. There were plenty of landmarks in the distance to find my way... and the main axis of the campus was easy to find and look for different places to explore, knowing I could easily return to the main path.”

- Daniel Grafstrom, Game Designer at Bungie in an interview with the author

4 Positive and Negative Space

Narrow spaces and constrictions such as hallways and corridors generally cause the player to walk more quickly through a space. Wide open spaces, especially in contrast to narrow spaces, will cause the player to slow down and visually take in their environment. Video game designers use positive and negative space to create a rhythm, telling the player when to speed up, slow down, or rest, creating variety and helping to tell a story.



Application

5 Saliency

Saliency is a synonym for contrast. Items with high saliency draw attention in any setting. Saliency can be created using color, scale, light, material, etc. Designers use items of high saliency to get the player's attention and draw them in that direction.

6 High Ground

Many video game environments offer a high ground where the player can survey their surroundings. According to prospect-refuge theory, humans are likely to seek out high places with a view, or take refuge in sheltered places. People are often drawn to explore topography, looking for view points and refuges.

7 Nature

The theory of biophilia posits that people are attracted to scenes of nature. Video game design seems to agree, since many games use water, trees, and other natural landscapes to draw player's attention to different sites.

Image: Saliency and high ground at Gas Works Park. Image by Joe Mabel (top). Screenshot from *Witcher III* (CD Projekt Red) showing a high saliency object in nature (bottom).



8 Light

Light is one of the most widely used wayfinding tools in video games. Brightly lit areas catch players' attention. Players almost always go towards more well lit areas. Lighting can also be used to create different emotions.

9 Motion & Sound

Motion and sound stimulate the senses and draw people in. Consider the sound of running water, church bells, children's laughter, windchimes, or machinery. Though the sense of smell isn't available (yet) in video games, scents such as flowers, grass, and trees could also act as an attractant as well. The International Fountain at Seattle Center attracts entire crowds though its combination of high salience (contrast) with its surroundings, use of music, lights, motion, and water.



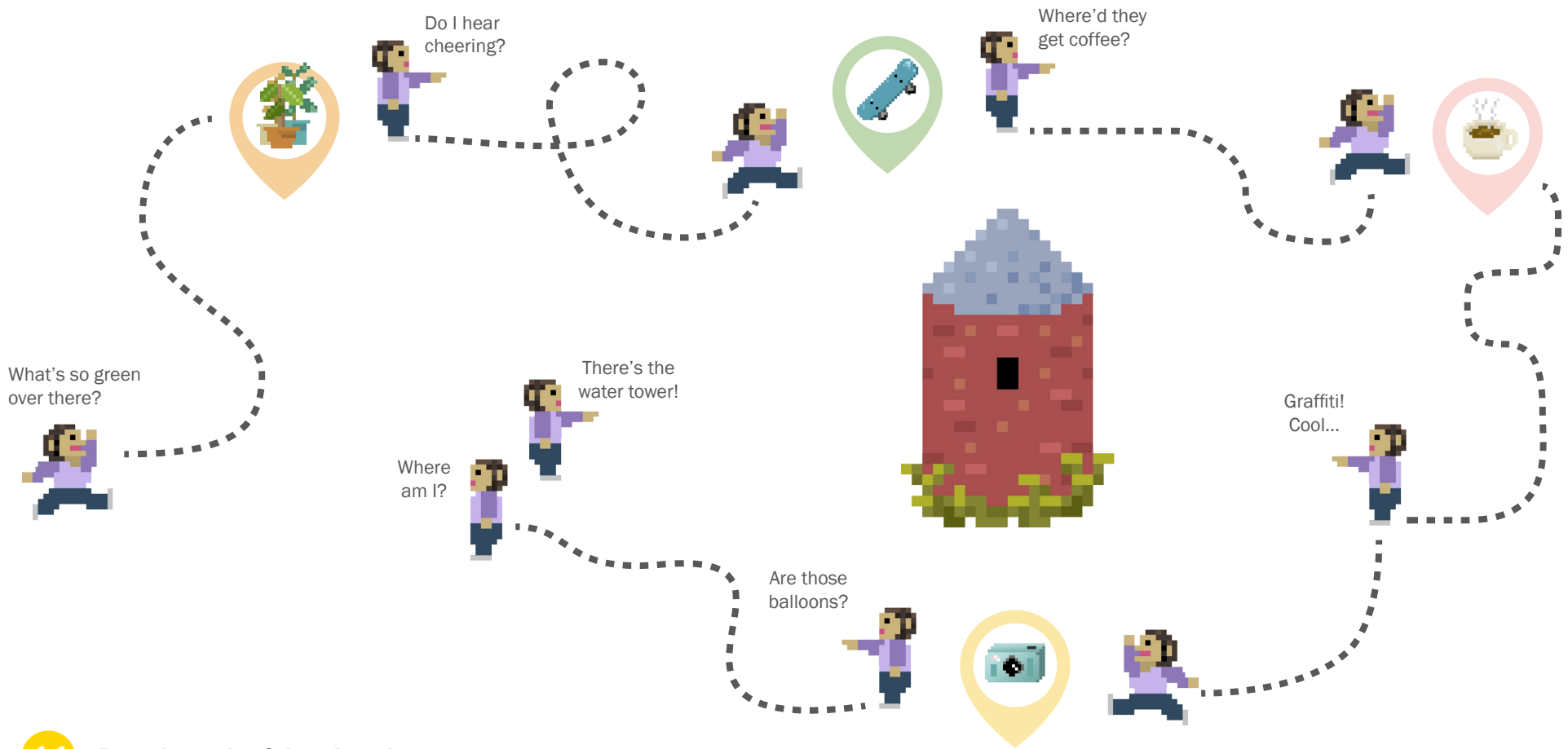
10 Mystery & Anticipation

Mystery and anticipation can be used to attract people in a certain direction. Whenever something is partially obscured, or there is more information to discover, people will be compelled to investigate. Mystery excites people and encourages them to explore.

An example is Skydebanen Park in Copenhagen, Denmark. From a busy commercial street, tall brick towers grab the attention of passersby (salience). At their base, is a very small door through which it is possible to see some green and perhaps hear the sound of children (mystery). Upon investigation, one discovers a delightful courtyard and lively playground on the other side (reward).



Image: The brick towers on Istegeade. Image courtesy of Google Street View (top). On the other side of the walls is a delightful playground. Image by Ty Stange (below).



11 Breadcrumbs & Landmarks

Breadcrumbs and landmarks can be used individually or in conjunction. Breadcrumbs are small attractors used to draw the player through space. Once the player reaches one attractor, the next attractor comes into view. When they reach that attractor, the next one comes into view, and so on and so forth leading the player through space.

Landmarks are large attractions that can be seen from a distance. They act as orienting devices. As long as a player can see the landmark, they have the confidence to follow breadcrumbs and explore, knowing they can find their way back, via the landmark. Landmarks can be churches, historic buildings, towers, geologic formations, water bodies, and more.

Case Studies

Rainier Vista, Seattle, WA: Rainier Vista provides visitors with **primary** and **secondary paths**.

The vista (in yellow) itself is a strong primary path. It's wide, clear, and flanked by trees. Visitors feel safe knowing they can easily find it, especially with the **landmark** Drumheller Fountain marking it's beginning.

Visitors are given the option to eschew the main path and take one of two secondary paths, which branch off from the main path. The moment of decision-making represents a moment where the visitor gets to exercise their player agency.

Each path provides a different experience and a different **reward**. Path A leads to the Medicinal Herb Garden via a meandering wooded path, and path B leads to Sylvan Grove Theater via a tunnel through trees.

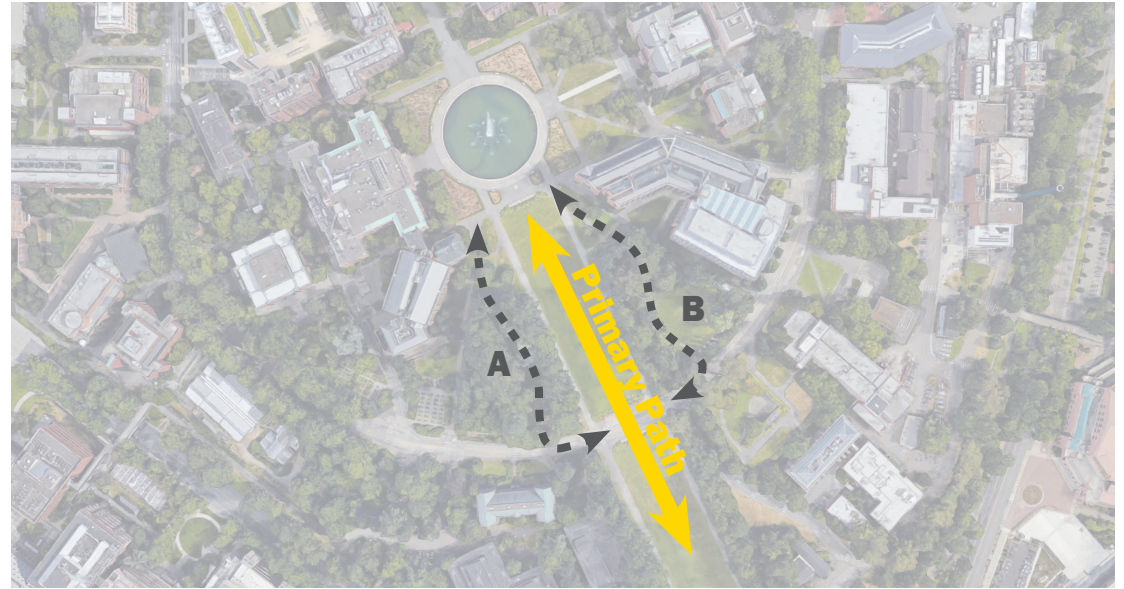


Image: Diagram of primary and secondary paths on Rainier Vista. Satellite image from Google Maps. View into Sylvan Grove Theater. Photo by Joe Mabel (bottom left). The Medicinal Herb Garden at UW. Photo by UW Sustainability (bottom right).

Case Studies

The Freedom Trail, Boston MA: is an example of using **color** and **material** to guide tourists on a walk connecting historic monuments in Boston. A narrow red brick line, bordered by grey stone, inlaid in the ground connects the landmarks. At each location, a metal marker is inset in the ground, letting the visitor know they have reached a site of significance, their **reward**. Tourists can download the freedom trail app which assists visitors along, or they may choose to challenge themselves by following the trail on their own.



The Arc Du Triomphe, Paris FR: uses **framing**, **lead lines**, and **nature** to attract attention to the Arc Du Triomphe, which acts as a **landmark**. The trees and buildings that line the Avenue du Champs Elysees frame the Arc du Triomphe. The street and the green of the trees become lead lines that draws the visitor's eyes towards the Arc. The Arc itself frames a view through its arch and acts as a landmark, orienting visitors who glimpse it while exploring the avenue. This beautiful vista can be seen as a **reward** in itself.



Image: Boston Common Freedom Trail. Photo by Massachusetts Office of Travel and Tourism (top left). Freedom Trail. Photo by Giggel (top right). The Arc du Triomphe viewed from the Avenue du Champs Elysees. Photo by Cedric Chan (bottom).

A digital artwork depicting a dark, atmospheric landscape. In the center, a single lit candle sits on a rock, casting a warm, yellow glow. The surrounding environment is dark blue and black, with numerous grey, moss-covered rocks scattered across the scene. Sparse, thin, brownish plants and some small green flowers are visible in the foreground and midground. The overall mood is mysterious and contemplative.

ENVIRONMENTAL STORYTELLING

Image: Candles in *Dear Esther*
(The Chinese Room)



Introduction

While the previous chapter discussed rewarding the player for exploring, environmental storytelling provides the reason to explore in the first place. Video game designers often describe the environment in a game as a character in the story. The environment has a story, and communicates that to the player. It can answer questions like, where am I, what should I do, and where do I go from here?

For example, City 17, from *Half-Life 2* (Valve), appears to be originally human underneath layers of menacing alien architecture. This example showcases two functions of environmental storytelling, providing space for play and the reason for action. Without explaining anything, the player is motivated to defeat the invading alien force and reclaim the city for humans.

The third function performed by environmental storytelling, is to provide resources for players to create their own emergent stories. Players immersed in a game, often construct their own stories through their actions while investigating and interacting with a space. To some gamers, discovering the story hidden in the environment is the most fun, while others prefer to write their own story onto the environment.

“I think of layout design very much as a conversation between the player and the designer. When you enter a space, what do I want you to see? I generally start from the egresses of it, the nodes. Where the players makes their decisions, you need to stop and look around... You need to figure out what your environment is telling the player, and figure out how you can give the player as much information as possible so they feel very informed – but at the same time influence their decision to be the right one. It’s really fun.”

-Emilia Schatz, Game Designer at Naughty Dog in an interview with maxlevel.org (<http://maxlevel.org/uncharted-last-us-hour-emilia-schatz-pt/>)



Examples from Games

Gone Home: is an example of **detail**, **embedded information**, and **evocation of pre-existing associations**.

The law of closure is a theory in psychology positing that humans innately seek to fill in gaps to complete a picture. Harvey Smith, game designer at Arkane Studios, uses this concept to explain why players love to pursue missing clues to piece together an incomplete narrative. One game that does this particularly well is *Gone Home* (The Fullbright Company).

In *Gone Home*, a college-aged girl finds that her parents and sister are missing from their house. In the game, the only actions available are to explore the house and inspect items. While this may sound limiting, *Gone Home* received rave reviews and overwhelmingly positive responses from players.

In the game, the player reads journals, letters, and notes. They observe what's been left out and what is hidden. They come up with theories and find items supporting or refuting them. The player is left to piece together what happened on their own and that engagement is the pith of the game experience.



Image: In the game *Gone Home* (The Fullbright Company), the player is invited to interpret the scene and come up with their own explanation for what happened.

Application

Environmental storytelling can be something as simple as choosing what style pavers to use or where to put benches. Design communicates to visitors what kind of place it is, what its history is, and who the place is for. Think of a medieval city, where traditions of narrative architecture communicate wordlessly that a place is secular, royal, or proletarian.

Video game designers use environmental storytelling for all of the above, but with the added goal of making a place memorable. Designers of the built environment might refer to this as placemaking. Everyone can think of a place that is functional, but bland, perhaps a transit station or a monotonous streetscape. Environmental storytelling can be used to give personality to a place making it more vibrant and memorable.



Image: A Thai boxing ring in Superkilen Park, Copenhagen (Bjarke Ingalls Group) is a literal staging ground for narrative events, while also meant to evoke associations to the local Thai community. Image by Iwan Baan.

Application

“It has to be possible to miss some things to make finding them meaningful. You have to trust your players. Depending on execution, you can be successful at providing those details to the player while making it likely that they’ll find them.”

-Harvey Smith, Designer at Arkane Studios, in an interview with Nieman Storyboard (<http://niemanstoryboard.org/stories/harvey-smith-on-environmental-storytelling-and-embedding-narrative/>)

1 Detail at Different Scales

Movies and books tell a story by directing the audience’s attention to specific things. In video games, the audience learn the story by exploring and using their powers of observation. The act of exploring, uncovering, and piecing together a story deeply involves the player and creates investment.

The fun of exploring comes from constant discovery. Providing detail at multiple scales ensures players continue looking, investigating, and that they are rewarded. In *The Witness* (Thekla Inc.) players must constantly pay attention to their surroundings, because the answer to a puzzle might just be found in the environment.

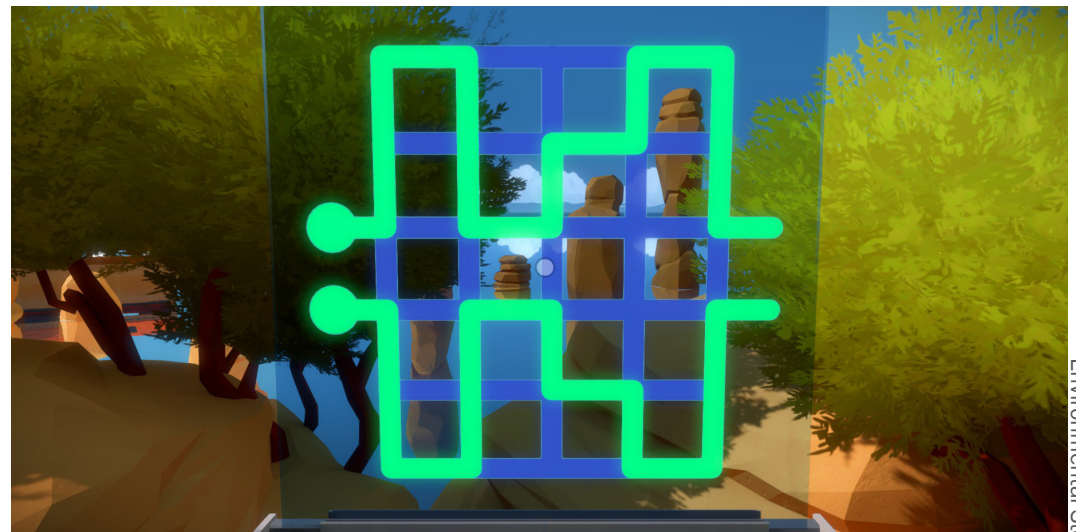
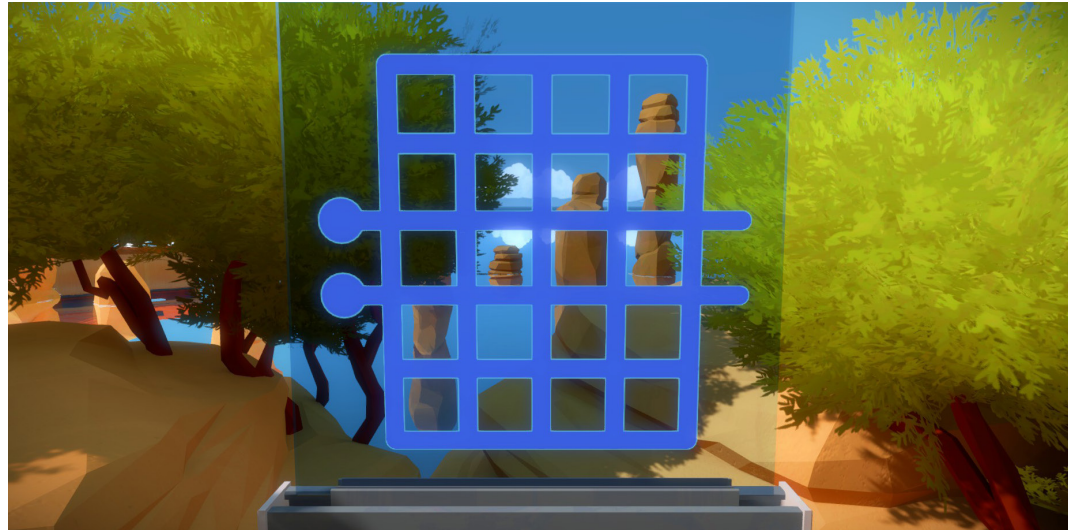


Image: In this example from *The Witness* (Thekla Inc) certain rock features are the clue, but the player must view them from the right angle. For other puzzles, multiple features combine when viewed at the right distance give the answer.

Application

“...the nature of virtual cities is to be textured with meaning on every panel and pathway. Having been crafted purely to be experienced allows the cities themselves to speak directly to the player, however quietly.”

-Jim Rossignol, “Cities in Video Games” in *Icon Magazine*, October issue 2011

2 Embedded Information

Embedded information in video games can take the form of objects left in certain positions, audio recordings, notes, diaries, etc. Each item provides a clue about the world, adding to its ‘realness’. The extra content contributes meaning to the player’s experience, as they explore the game.

In the real world, embedded information is often in the form of plaques or signs. For example plaques at Pike Place Market mark it as a historic district. Signs, materials, and symbols can also act as embedded information. Advances in technology now allow physical space to be augmented with digitally embedded information via QR codes and audio tours. Perhaps in the future, stories in the environment will be easily accessible via smartphones.



Application

3 Evoking Pre-existing Associations

An example of real-world environments that uses environmental storytelling on a daily basis are theme parks. Theme park designers rely on pre-existing associations from books, movies, plays, and other cultural media to evoke different moods, time periods, and situations. Environmental storytelling details are read against the visitor's previous experiences firsthand or through media.

In Disneyland, Tomorrowland borrows its aesthetic from World's Fairs while the Enchanted Village borrows imagery associated with European folktales. Games such as *The Last of Us* (Naughty Dog) use post-apocalyptic movie tropes to convey information about what happened, how long ago was it, and how people survived. This information is given purely through environment.



Image: The Tomorrowland entrance at Disneyland California. Image from Disney (top). In this scene from *The Last of Us* (Naughty Dog), game designers use the environment to show, not tell, the players what happened and how long ago (below).

4 Staging Player-Space

Another way to engage narrative is for the players to act out new narratives in the space. In games with this type of environmental storytelling, the players are prompted by the environment to construct a story through their own actions.

This concept echoes urban design concepts, such as loose space, flexible space, and performing space. The designer can provide a staging ground by anticipating different types of uses and planning for them. Another way to encourage emergent narratives is to leave space unprogrammed, with the intention that people will use the space to play out their own stories.

Tempelhofer feld in Berlin was once an airport, but is now a park. The majority of the space is unprogrammed. Berliners have used the unprogrammed space to stage their own narratives, including biking, rollerblading, kitesurfing, building gardens, barbecues, and libraries.



Image: People enjoy the runway at Tempelhofer feld. Image from Domantasm (top). Guerilla gardens flourish. Image from the website sugarraybanister.com (bottom left) Bücherboxx roughly translates to public bookcase. At Tempelhof, an old phonebooth was converted into a library area. Image from Charlotte Henard (bottom right).

“The environment, actors, props, and game world are really just a playground for players to experience. They [the players] create their own stories by interacting with the environment.”

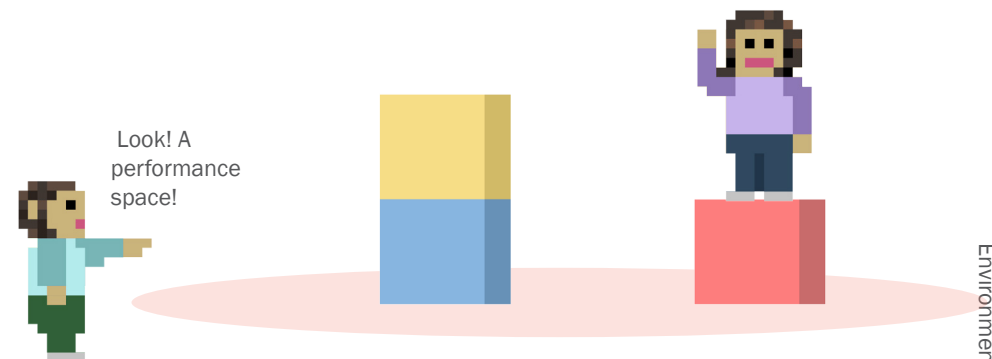
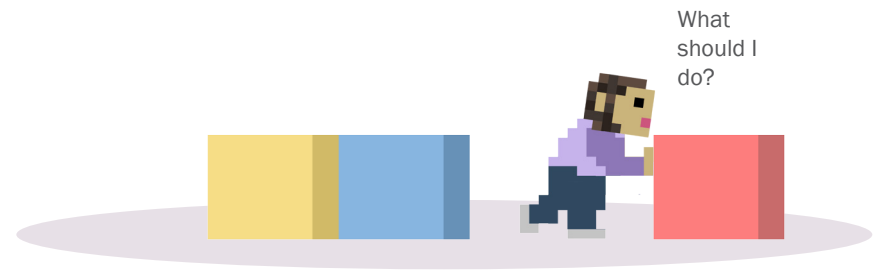
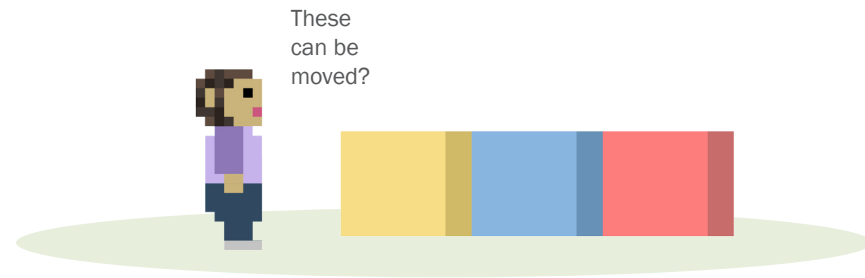
-Eric Nevala, Designer at Wobbly Duck, in an interview with the author

5 Provide Resources for Emergent Narratives

In a situation where the designer is unsure if players will use a space for their own narratives, resources can be provided to help. Game designers use characters, props, and other interventions to encourage players to get creative.

Props, such as games, interactive site furniture, things with moving parts, playful objects, or items that are part of a larger whole, can stimulate visitors to act playfully in that space.

Another way to provoke activity is to let visitors know that a place is flexible by scheduling programming in it and ensuring there is unprogrammed time where visitors are allowed to behave as they like in the space.





Case Studies

Seattle Public Utilities South Transfer Station: This landscape design led by Swift Co. uses **detail** and **embedded information** to tell stories in the environment.

The South Transfer Station takes garbage, recyclables, and other waste for disposal. Alcoves in the walls and benches provide places where staff can showcase interesting objects they find amongst the waste brought to the station for disposal.

Creating space for displaying objects, allows the transfer station staff a chance to tell their story about the work that they do, what they find interesting, and the things that people in Seattle throw away. Other details on site, such as a wall of street signs, tell a story about the area the station serves, the city's commitment to recycling, as well as letting visitors see themselves and places they love reflected in the site.



Image: A found item on display in one of the gabion walls. Photo from swiftcompany.com (left). Street signs tell another story. Photo from swiftcompany.com (right).



Case Studies

Memorial to the Murdered Jews of Europe, Berlin: is an example of creating an environment that **stages player space** and provides **resources for emergent narrative** experience.

Without the typical plaques and labels expected at a memorial, Peter Eisenman's environment speaks quietly to its visitors through design and experience. The memorial doesn't tell visitors what it is, what to think, or how to feel, but creates a platform for the visitor to have an experience. While the visitors construct their own experiences, Eisenman's use of material, scale, and evocation of tombs, quietly guides and softly nudges the visitor to have a specific type of experience.

For many visitors, the experience of being in the memorial prompts them to form narrative conclusions about remembrance and loss. Lessons learned through experience can be more powerful than any informational sign.



Image: Memorial to the Murdered Jews of Europe. Photo by JoJan (top) Photo by bowdywanders.com (bottom)



THE CITY AS A SANDBOX



Introduction

Sandbox games are a genre of video game designed to maximize player freedom and agency, for example the extremely popular *Sim City* and *The Sims* (EA Games & Maxis). In these games, everything in the world can be interacted with, played with, sometimes even dismantled and rebuilt. These games reflect a real world ability that civilians don't often use, the ability to exert meaningful and significant change on our environments.

A game where players can actually do whatever they want is an impossibility, since that would mean granting players the ability to change the game. Instead, game designers create environments that evoke the feeling of unlimited freedom, within a framework. The infrastructure of the game provides parameters within which players can explore all possible options.

Another problem designers face in sandbox games, is maintaining the interest of the player. With a completely open playing field, many players will eventually lose interest. Game designers provide players with a variety of tools, situations, goals, rules, and rewards to keep the gameplay interesting.

“As we shall see, it is the possibility to make choices...to explore and experiment with the narrative and visual elements of the GTA [Grand Theft Auto] cities that creates a sense of ‘played’ space—the city is no longer constant, much less something that is fixed... From this perspective the city takes on a kind of transparency as, real or not, its mechanics, physics and social kinetics are used to generate new possibilities.”

-Rowan Atkinson and Paul Willis in “Transparent Cities: Re-shaping the Urban Experience through Interactive Video Game Simulation.” published in *City 13*

**Can I really do
WHATEVER I
want?**





Examples from Games

Minecraft: is a probably the most famous sandbox game.

In the game, players can mine the world for resources, demolish, and build anything. A number of astonishing things have been built in *Minecraft* (Mojang), from a basic computer to a replica of 1666 London. The replica of London was created by the design company, Blockworks, for the Museum of London. Blockworks often uses *Minecraft* as a visioning tool at community design charrettes.

Minecraft maintains the attention of players by offering a variety of modes, for example survival mode, creative mode, and spectator mode. However, *Minecraft* has been most successful through its community of players.

One of the key abilities in *Minecraft* is the ability to create maps that other players can explore. Allowing players to share their creations with each other has resulted in a community of *Minecraft* users who love to show off their work, explore each other's work, and challenge the limits of what can be accomplished in the game.



Image: A replica of 1666 London was commissioned by the Museum of London for an exhibit on the Great Fire. Image created in *Minecraft* by Blockworks.



Application

The popularity of sandbox games suggests that people love being able to change their surroundings. Graffiti artists, guerilla gardeners, activists, and anyone who has ever redecorated their home can attest to this.

The real/physical world is a sandbox. In theory, you could walk outside and dismantle and rebuild a building, but cultural rules would prevent you from getting very far. In the real world, public spaces are not meant to be changed by civilians and attempts to make changes are prohibited.

Sandbox-type play in cities can be encouraged without giving in to total anarchy. Just like video game designers use stories, tools, rules, and goals to create situations where players can experience total freedom, cities can encourage people to engage in sandbox play within parameters.

For 20 years, the famous 5 Pointz building in New York was home to legal graffiti art. The building became a playground of freedom and self expression. Within the structure of the city, it was a place where artists felt free to do whatever they wanted.



Image: For 20 years, the 5 Pointz building was an internationally known site for legal graffiti art. Murals were reviewed and curated by another graffiti artist. In 2014 it was demolished. Image by Thomas Hawk.



Application

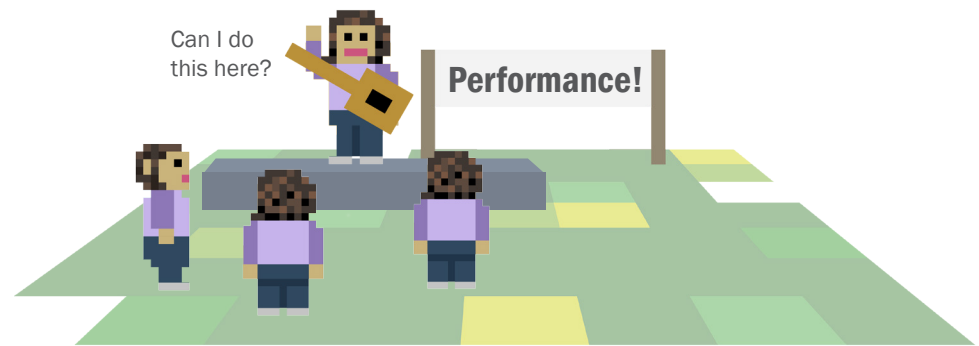
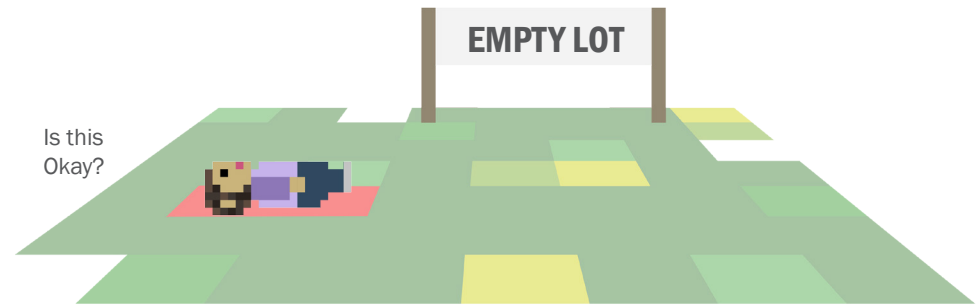
“What is interesting about the sandbox form is not that it allows full freedom, but that it generalizes and parameterizes, it finds arenas for agency and gently crafts the potential space of the game. It fosters a sense of free-play and exploration of that space. It engenders a sense of player control, without actually handing over the reins entirely.”

-Steve Breslin in “The History and Theory of Sandbox Gameplay” at Gamasutra.com

1 Provide Arenas for Agency

The difference between an illegal fruit stand on the street and a farmers market is that one of them was provided a sanctioned arena to exercise their agency.

What are permissible ways people can exercise agency in public space? What behaviors are acceptable or at least harmless? Where can these behaviors be permitted? How can people leave their mark on their surroundings? Some ideas for arenas that can be provided by cities are legal graffiti areas, allotment gardens, p-patches, empty lots, and unprogrammed spaces for the community to use how they wish.



2 Provide the Tools for Creativity

Just as sandbox games provide the player with tools to inspire their play, people in the real world can be given tools to help them reimagine their surroundings.

Movable parts can influence people to rearrange things to create their environment. In adventure playgrounds, children are provided with wood, saws, nails and other tools. With these tools, they build their own play space. “Pop-up” adventure playgrounds have emerged, allowing a space to become an adventure playground for a day with disposable tools like cardboard boxes.

Art has often been a tool for community expression, communication, and provocation. In 2011, artist Candy Chang covered an abandoned house in New Orleans with chalkboard paint, and the words “Before I Die I want to _____,” over and over. Pieces of chalk were left around, and before long the wall was filled. The project gave people permission to leave their thoughts and feelings on the walls of their environment.



Image: Children build their own playspace at the Mercer Island Adventure Playground. Photo by Joshua Huston (top). The 'Before I Die' wall by Candy Chang. Photo by Trevor Coe at candychang.com (below).



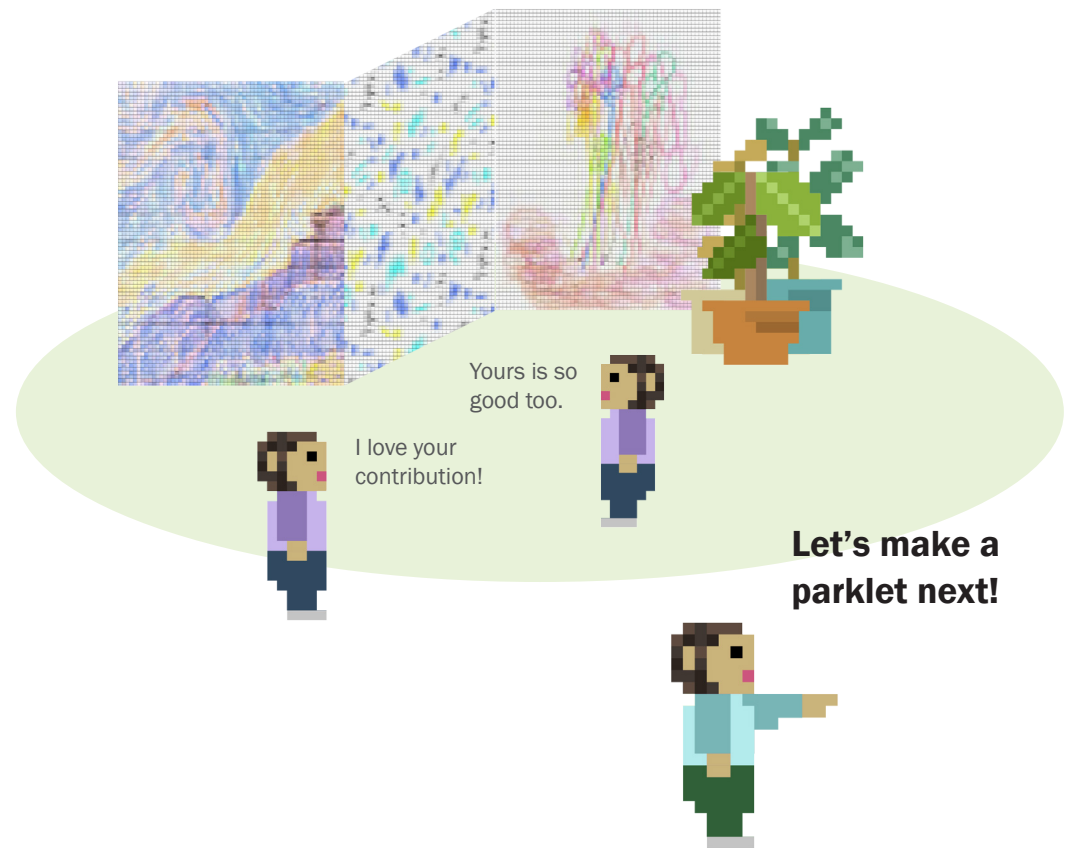
Application

3 Make it Multiplayer

People enjoy playing *Minecraft* for the ability to create new things from scratch and for the ability to share those things with others. Collaboration is a huge part of the fun of video games. Working together or working against each other, the social aspect fulfills basic human desires for community and provides an element of unpredictability.

Multiplayer sandbox play can occur in the real world in multiple ways. The only requirements are that multiple people are involved in a creative effort. Some examples are community design, public art, community cleanup events, group builds, or collaborative art.

In games, many people view the presence of other players as an invitation for collaboration or competition. As soon as one person had made a binary computer in *Minecraft*, others wanted to see if they could do it to. The resulting iterations expanded upon what was believed to be possible in *Minecraft*.





Application

4 Provide Impetus for Action

Narrative continues to play a huge role in sandbox games. It provides the ‘why’ initiating activity. In the real world, this can take the form of competitions, public outreach, community meetings, etc. One can provide reasons that catalyze sandbox play, be it beautification, restoration, protest, placemaking, building homes for homeless, etc.

5 Reward Players

As a rule in video games, desired behavior from the player is always rewarded. Typical rewards in sandbox games include renown, rankings/levels, items, prizes, etc. In some cases, the opportunity to act freely and have social interactions is reward in itself.

Cities can reward people for contributing to the public realm by supporting them through grants and funding, publicity, or through permanent installation.

Most parklets only exist for one day a year (Parking Day). One way the city of Seattle has rewarded creativity in the public realm has been by recognizing parklets as permanent installations.



Image: The parklet outside Bulldog News in U District has been there for several years. Photo by SDOT Photos.



Case Studies

Squatting in Berlin, Germany: Berliners and their government have a history of tolerating squatting to the point of officially recognizing several squats (**rewarding players**). The empty lots in Berlin **provide the arena** for **multiplayer, sandbox play**.

Squatting is the act of illegally occupying property, such as abandoned buildings, plots, or apartments. In Berlin, it is not uncommon for squatters to give purpose to the squat by hosting concerts, films, galleries, or serving food.

UFA-Fabrik was an abandoned film factory that was eventually transformed by the community of squatters into a sustainable living commune. Now the premises host classes at their performing arts theater and recreation center, welcome visitors to their cafe, annual conferences, and festivals.

Prinzessinnengärten is an urban agricultural garden that similarly started with squatters. After it became a popular garden space, several public discussions resulted in the city deciding to legitimize the space by renting the land to the garden managers. The site now hosts a DIY bike repair station and cafe in addition to the garden.



Image: The outdoor performance space at UFA-Fabrik. Photo from ufaFabrik IKC (top). Prinzessinnengärten kept plants in movable crates so that, if they were to be evicted, they would be able to take their plants to a new location. Photo by Picture Alliance / DPA (bottom).



Case Studies

Black Rock City, NV: Every year at the end of the summer, a 70,000 person city springs up for roughly a week in the middle of the desert for the festival Burning Man. The festival's organizers **provide the arena** for **multiplayer** play, and the players bring the **tools**. Festival-goers (burners) bring everything they need to construct a city and deconstruct it when the festival is over. Each year there is a different theme, and thus the city is different each year.

Burners typically strive to represent the annual festival theme in their structures (**narrative**). Like video game characters, burners wear bizarre and whimsical costumes, deconstructing and reconstructing their identities along with the city.

Black Rock City utilises many of the other tools and strategies outlined in this handbook. Because the city is temporary and its primary function is to provide memorable and meaningful experiences for its inhabitants (**reward**), the city is unconstrained by typical real-world responsibilities. It is a city where the experience is the reason to be there, just like in video games.

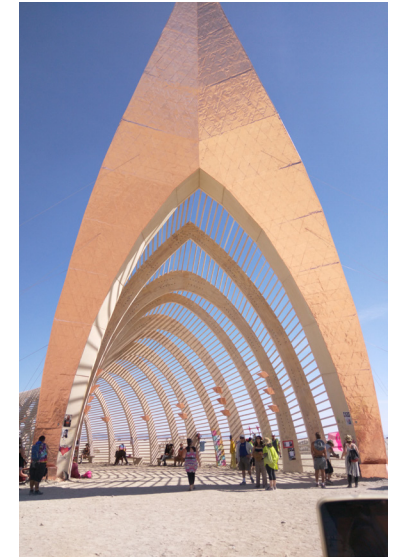


Image: The burning man in 2012. Photo by Stuart L Chambers (top left). People remake their identities as they remake their environment. Photo by Scott Beale (top center). An example of the pop-up architecture. Photo by Cory Doctorow (top right). Aerial photo from Reuters (bottom).



SIDEQUESTS



Introduction

Video games typically have a main quest associated with the storyline and smaller quests to provide variety. These are called side quests and they are usually optional, but contribute knowledge, skills, and items that support the player in the main quest.

Side quests are a way for video game designers to ensure that there's something for everyone in a game. While the main quest might be aimed at adventure and exploration, side quests can add different types of interaction such as puzzles or storytelling. They contribute variety of activity, personality, and richness to the game experience.

Spatially, sidequests often appear on secondary paths. Often they are denoted using design language consistently used throughout the game. They are useful in getting players to explore different regions of the gameworld, to get comfortable navigating, and to practice skills.

Public opinion on side quests is divided. Players more motivated with rushing to finish the main quest, often find them distracting or annoying. But many find them to be a welcome respite from the main activity. Sometimes a little distraction is necessary to move forward.

“Stepping off the beaten path in any given game can open up a whole new world. Main story lines are fine, but side quests often contain better writing, funnier jokes, and more interesting mechanics. Sometimes they’re so good that when the credits roll, the distractions and detours burn brighter in your memory than the central journey itself.”

-Samuel Horti in “The Best Sidequests in PC Gaming” on pcgamer.com

Examples from Games

The Witness: Hailed as one of the best games of 2016, *The Witness* (Thekla Inc.) is a puzzle game set on a mysterious island. The main quest is to solve the puzzles and enter the volcano. Finishing the main quest takes 16 hours on average, but completing all content can take 45-100 hours.

Extra content in *The Witness* consists of short audio readings from philosophical texts, films (a documentary, lecture, a clip of a spiritual guru, an Italian film...), and hidden visual symbolism.

In the game, shadows often help the player solve puzzles. Once the player knows to look for shadows, they start seeing things in their environment differently. In one area of the game, a statue of a man reaches unsuccessfully for a goblet on top of a glass case. However, if the player looks at his shadow, they see his shadow is holding the goblet.

What does it mean? For many players a greater meaning remains elusive, even after completing the whole game. Whether or not the player understands a deeper message is besides the point. These extra pieces are just more details to puzzle over, and puzzling is the point of the game.



Image: Is it a reference to Plato's Cave? Or a lesson in humility? Reaching for the goblet (top). Happily juggling? Or raising arms in anguish? (Below) Images from *The Witness* (Thekla Inc.)

Examples from Games

Red Dead Redemption: In *Red Dead Redemption* (Rockstar Games) players play an ex-outlaw in the wild west. The main quest throughout the game is for the character to find the members of his old gang, but there are multiple smaller adventures on the side. The game has almost 100 side quests.

By some accounts, completing the main quest takes about 10 hours. To finish all the content in the game takes over 40. The sidequests often consist of favors performed for strangers, treasure hunts, finding hideouts, capturing bounties, and earning challenge ranks (by becoming an expert in hunting, marksmanship, plant identification, etc.).

The sidequests help paint a more detailed picture of the wild west, making the characters and their motivations seem more real. In side quests, the player is often asked to make moral decisions that help the player build their character's identity in the game. Sidequests also help sustain the player's interest in the game longer by letting them take a break from the main mission and dabble in other activities.



Image: Finding treasure in *Red Dead Redemption* (Rockstar Games).

Application

Building side quests into a game is an acknowledgement that sometimes the spice of life can be found peripherally to our main goals. Though life is rarely structured as clearly as a game, in the real world people have short-term and long-term goals that can be viewed as main quests. In the real world, no one is able to relentlessly pursue their main goals without pause. People get attention fatigue and often need to focus on other things in order to recharge their attention. Sidequests are found in supporting spaces/activities and can provide perspective, meaning, and relief to our main goals.

Side quests can be implemented at any scale in any place. They could be a great way to interrupt the monotony of travel, for example along commutes. Side quests can provide a respite from the main activity, or they can enrich it. For example, exercise equipment are a public invitation, enticing passersby to deviate from their current paths and engage in an activity.



Image: Exercise equipment in parks invite people to take a break from whatever they're doing and try an activity. Photo from actionfitoutdoors.com (bottom).

Application

1 Use Technology

Video games organize and keep track of quests through a menu. When the player accepts a quest or side quest, the quest will show up in the menu as part of a list. Think of it as a to-do list.

In *The Witcher 3* quests are organized by type: main quest, secondary quest, treasure hunt, etc. When progress is made on a quest or it is completed, a notification lets the player know, and it is removed from the list (or moved to a list of completed quests).

Getting a college degree could be seen as a main quest and getting exercise could be a side quest. Some apps have already started to gamify everyday activities. Quest app, Habitica, iReward, Chore Hero, are just some of a growing market of games that allow us to level-up, earn items, and fight monsters by completing items on to-do lists.

As technology progresses, more possibilities will emerge for apps and games that encourage us to have meaningful experiences as side quests to the main goals in our lives. These apps could even encourage us to visit new places.

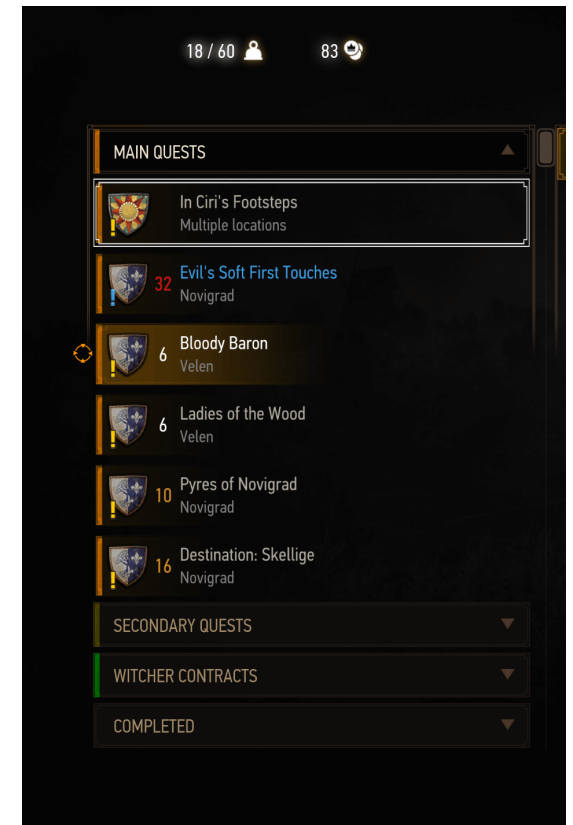
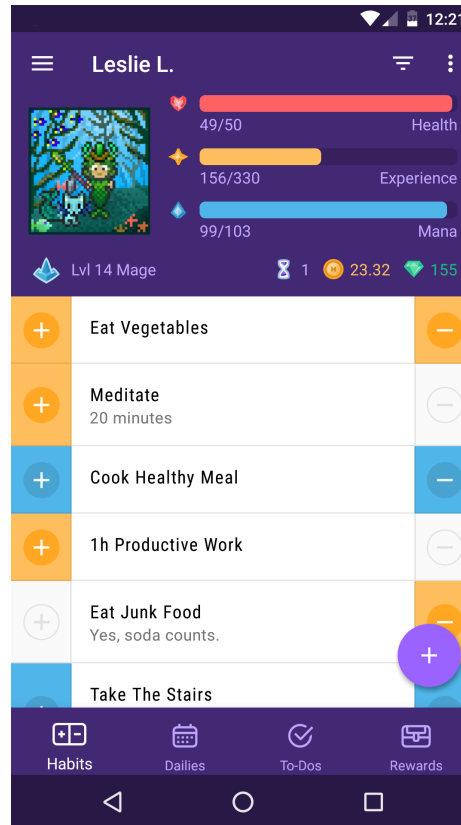


Image: The Habitica Android App, showing a to-do list of quests (left). A quest log in *The Witcher 3* (right).

Application

“Side quests, like main quests, benefit from an open-endedness that allows for different solutions and playstyles and that ideally also acknowledges all of the player character’s relevant skills.”

-Richard Moss, “Designing side quests? Study these 7 games” at Gamasutra.com

2 Create Challenges

Many are motivated to complete sidequests because they love a challenge. Perhaps their friend did it and they’re competitive. Perhaps it represents something short they can accomplish quickly. Or perhaps they’re stimulated by the difficult goal of completing the whole game.

When presented with a challenge, many people are motivated to take it on. Here are some ideas of challenges in public space. Draw a line in the ground and label it “Start”. Draw another line a short distance away and label it “Finish.” Start a campaign to find stories, building details, views. Much like Pokemon’s slogan, “Gotta catch ‘em all”, make a challenge about collection. A challenge could be to photograph all of the different sewer covers, or every tiny library in a



Image: Pokemon Go! was about turning everyday outdoor experiences into a game. Players can take breaks from whatever they’re doing to take walks, looking for pokemon. Photo from KeongDaGreat.

So, how was your day?



Oh, pretty good.

It says we should race...



Race to where...?

START

Who cares!?!



Application

3 Create Supporting Spaces

Many sidequests are about providing additional narratives, challenges, rewards, and experiences, but all of these require space. To provide pedestrians with side-quests to complement or provide relief to their main quests, there has to be space for them to occur.

Secondary paths support primary paths by creating space for experiences and rewards. Similarly, 'supporting spaces' support primary spaces by providing an area for extra content such as games, events, competitions, or art. These spaces can be built in, literal 'side' spaces, or they can be temporarily appropriated. Framework, a planning and design firm in Seattle, blocked off an underutilised street to vehicular traffic, appropriating it to support a game of 'street scrabble'.



Image: This game of street scrabble beckoned people from their 'main quests' to engage in some extra fun. Photo from weareframework.com (top).

Case Studies

99 Tiny Games: For the 2012 summer olympics in London, game design studio Hide & Seek developed 99 tiny games to scatter around London.

Colorful circles with easy-to-learn instructions for short games were pasted to the ground, walls, bridges, and more. That summer Londoners and tourists alike were interrupted by these games. Like side quests, they provided small, quick, optional entertainment to occupy and entertain pedestrians as they pursued their main goals. 99 tiny games inserted a little fun and engagement into the streets of London

A large map showed where all 99 tiny games were. Finding and playing all the games became a challenge taken on by the more serious players. Passers-by were often fascinated seeing others play, and would approach to join.

One such game on a bridge encouraged players to watch pedestrians and take turns choosing a pedestrian and saying the word “dum, dum, dum” to the pace of that pedestrian’s walk. Other players had to guess which pedestrian. Hearing strangers on a bridge, rhythmically saying, “dum, dum, dum, dum” surely turned heads.

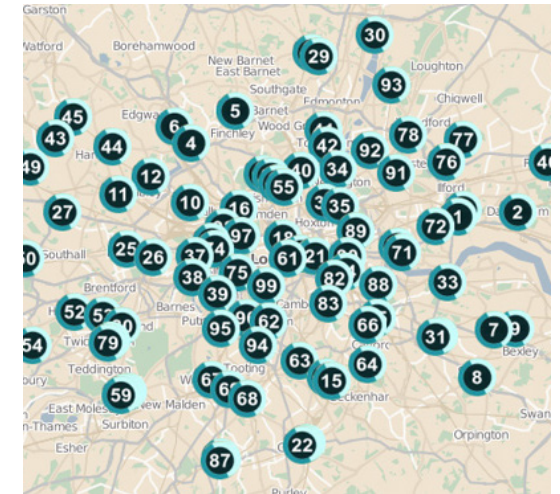


Image: A game placed before a bench (top). Map of the 99 games (bottom right). An example of a 2-player game placed over pavers (bottom left). Images from Holly Gramazio.

Case Studies

Geocaching: Geocaching is the practice of hiding and seeking containers in the environment, using GPS.

Containers hold items of value or interest and often have a paper log where seekers can write notes about their experiences. Though some geocaches involve significant travel, “cache and dash” geocaches are quick finds that can be done as short forays between life’s main quests. Players are rewarded for the efforts by discovering the cache’s contents.

Seek Bou Journey: Introduced in 2006, seek Bou Journey was a series of riddles that were part of a larger treasure hunt in downtown Beijing.

These hunts had cultural and historical themes. Participants often learned something new as a part of the process. Each year the theme was different and various challenges could involve local businesses. For example, one year the theme was food and participants had to order specific cultural specialties at a local restaurant in order to receive the next clue.



Image: A sample geocache.

CONCLUSION

The intention behind this document is to share tools, techniques, and processes from video game design with designers of the built environment. While I am not advocating that the real world should become a game, I am convinced there are aspects of video game design that could be used to make being in the real world a more engaging, immersive, and enjoyable experience.

Whether we are designing landscapes with navigational experience in mind, or spicing up a downtown with sidequests, these tools and strategies should at the very least make us rethink the way we design public spaces. I hope this collection inspires designers to think more about our experience of place from site to city scale.

For more information on my research and the tools and ideas presented here, my full thesis is available online through the University of Washington. However, perhaps the best way to learn more and understand the appeal of video games is by playing them. I encourage all readers to try some of the games presented in this handbook. You may learn a thing or two, and you'll definitely have fun while you're at it.

“Theckla broke even, on their 6 million dollar investment, during the first week of sales. During that time, more individuals and groups explored landscapes and spaces (legally or illegally) that we designed, than will ever explore our built landscapes in my lifetime.”

-David Fletcher speaking on his role as a landscape architect on *The Witness* in an interview with the author

**I'm going to go
play some games!
Or maybe I'll just
go outside...**

