TAKE ME TO THE RIVER: DESIGNING THE INTIMATE WATERFRONT

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ABSTRACT

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The purpose of this thesis is to establish design guidelines that will encourage an intimate relationship between waterfront users and the adjacent waterway through increased immediate physical, visual, and audible access to water. This thesis includes a literature review to build an understanding of: (1) the relationship between people and water; (2) the evolution of urban waterfronts in the United States and how intimacy with water is limited by the siting of buildings, construction of transportation infrastructure, and installation of flood control measures; and (3) three approaches used to create design guidelines for an intimate waterfront design. The established design guidelines are then used to analyze three waterfronts: the Inner Harbor in Baltimore, Maryland; Carroll Creek in Frederick, Maryland; and the Georgetown waterfront in Washington, D.C. This analysis leads to the position that successful urban waterfronts must allow for immediate access to the water to foster an intimate experience for waterfront users. This position is then tested through the anaylsis and design of the Rock River waterfront in Janesville, WI.

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“Water has the power to penetrate the body and soul and to communicate to them its own freshness, clarity, and pureness.”

–Ivan Illich p. 27

Intimacy: something of a personal or private nature; marked by close acquaintance, association and familiarity.

–Merriam Webster Dictionary

CHAPTER 1: INTRODUCTION

Humans have always been instinctively drawn to the water. Historically, water edges have provided man a means for sustaining life. After the founding of port cities, the waterfront provided a place for public interaction, commerce, and recreation. The early shipping industry tended to construct warehouses and shops on riverbanks, effectively creating a barrier to the water. As industries began to manufacture goods on the waterfront, raw materials were transported over land and a complex infrastructure of rail and road was built near the water, separating the city from the water. Adding to the separation, many urban areas were built in flood plains of nearby waterways, requiring flood control measures to insure against economic loss. Such measures not only created physical barriers between the water and the economically rich downtown areas, but also created a barrier between city dwellers and the water.

In recent history, waterfront revitalization has lured people back to the urban waterfront by once again providing a place for public interaction, commerce, and recreation. Creating an intimate relationship between waterfront users and the adjacent waterway can maximize the waterfront experience, making it especially important that design guidelines address the treatment of existing functional barriers and create immediate physical, visual, and auditory access to the waterfront. Industry observers in the United States and abroad agree with the need for such increased accessibility to water. For instance, the *Korea Times* reported that the future of China's Han River depends on "human accessibility to the water front," and Oregon's *The Skanner* reported that an effective method for waterfront cities to "move forward" is not only by way of clean water and habitat, but also through more and better access to the river, specifically encouraging the creation of new and vibrant riverfront communities. (Yearn-hong, 22; Proctor, 2) The American Planning Association explains that downtowns greatly benefit by the easy accessibility of natural amenities, such as bodies of water, untarnished by defacing developments, and waterside freeways. In order to increase appeal, revitalization projects should focus on accessibility to such amenities. (Filion, 3)

The Inner Harbor in Baltimore, Maryland; Carroll Creek in

Frederick, Maryland; and the Georgetown waterfront in Washington, DC are three case studies where design guidelines are used to analyze the waterfront experience with a focus on intimacy. The findings of this study show that intimacy with the water is a relevant topic today because of the presence of the disconnecting functional structures: poorly sited buildings, transportation infrastructure, and flood control. The case studies also bring attention to other factors that can enhance or limit intimacy on the waterfront.

Defining Intimate Waterfront

When considering the intimate waterfront, one must first establish the meaning of the word "intimacy" within the context of waterfront development. Merriam Webster dictionary defines intimacy as "something of a personal or private nature; marked by close acquaintance, association and familiarity." To achieve a close acquaintance, one must be able to have an immediate connection. Gordon Cullen demonstrates this idea by noting the difference between having fifty dollars in a bank or having fifty dollars in the pocket. Both situations include having knowledge of the possession of the fifty dollars, but having fifty dollars in the pocket is more exciting because one has the potential to use it. (Cullen, 189) One can deduct from the definition of intimacy and Cullen's example that to have a personal or private connection to, close acquaintance with, or familiarity towards a waterway, that waterway must be physically immediate, not just intellectually accessible. Therefore, the intimate waterfront defined for this paper is a waterfront that enables close physical, visual and audible contact.

Research Methodology

Developing guidelines for an intimate waterfront involves the following research methods. An initial literature survey investigates the human connection to water and the history of urban waterfronts. The goal of this initial review is to explain the draw that humans have to water and to describe the historical disconnect between humans and urban waterways. The methodology used to support the position that an intimate waterfront design will maximize the waterfront experience is an examination of established research surveying cultural archetypes, phenomenological studies, and psychological studies. The goal of this examination is to gain an understanding of the preferences people have for the development of the water's edge and sites close to water. With the findings of the literature in mind, design guidelines are established concerning three disconnecting waterfront structures (flood control structures, transportation infrastructure, and poorly sited buildings) and how

they can be circumvented to maximize intimate experience on the waterfront.

The Human Attraction to Water

Considered in western philosophy as one of the four basic elements of the atomic universe, along with fire, earth and air, water is innately connected to human life. It has the ability to evoke a broad range of emotions and imaginative experiences upon contact. Breen and Rigby describe the lure of water as "powerful and universal," and Halprin explains that "[t]here is a quality about water which calls to the most deep rooted and atavistic part of our nature." (Breen and Rigby, 10; Halprin, 134) Halprin expands on water's effect on humans stating that "[e]ven in the captive, contained, and confined pools of our urban waterways, water affects us in the same way as does a wild animal in a zoo, pacing back and forth in his cage, beautiful and quietly desperate, controlled but with implications of wild danger." (Halprin, 134) There are endless reasons for this intimate, human-water connection, three of which include: (1) water's importance to religion and philosophy; (2) water's notoriously symbolic appearance in literature; and, finally, (3) water's ever-changing physical nature.

Given the deeply personal nature of religious and philosophical beliefs, an intimacy between humans and water necessarily results from water's critical role in both religion and philosophy. Water's presence in many faiths is often intertwined with beliefs relating to or instrumental during rituals involving birth, death, and regeneration. For example, in the Christian religion, water symbolizes the commencement of a life of faith, as it is used in the blessed sacrament of the baptismal ceremony to wash away sin. As described by Eliade,

> ***...immersion in water signifies regression to the performed, re-incorporation into the undifferentiated mode of pre-existence. Immersion repeats the cosmogonic act of formal manifestation; immersion is equivalent to dissolution of forms. This is why a symbolism of water implies both death and rebirth.***

Further examples of water's importance to the Christian faith appear in numerous passages of the Bible where water often symbolizes the presence of God (Exodus 17:1-7), the purification of sin (Numbers 5:18-27), or sacrifice (1 Chronicles 11:15-20).

Water can also be found at the heart of philosophy. For instance, the Chinese philosophy known as *feng-shui*, translated to mean "wind and water," is based upon the concept that man is a product of the universe. (Bodde, 129-30) More specifically, water's central role in the *feng-shui* practice affects believers in life and death, as a man's house and burial place must be arranged so they are in harmony with the natural forces, *i.e.*, wind and water. (Bodde, 129-30) Further, while fire and air represent the Yang within Chinese

thought, water and earth represent the Yin, with a third "chamber of the spirit" component. (Wong, 36) The following excerpt from *Harmonizing Yin and Yang* by Eva Wong offers a mystical yet basic explanation of the fundamental relationship between the three:

> *Yang exits and yin enters. They flow and light up the two directions. Three is their number, and they are patterned after water and fire.*

Not only is water a key component of religious and philosophical metaphors, but it also has historically played a symbolic role in literature, adding yet another layer to the intimate relationship between water and the human experience. For instance, literature combines elements, such as water, with color or geometric symbols to suggest the nature of important relationships or events. The colors associated with water are generally cool retreating colors, such as blues and greens, in contrast to colors associated with fire generally being warm advancing colors, such as reds and oranges. (Fraim, XII, 1-2) Further, water is generally associated with a downward pointing triangle, whereas fire is associated with an upward pointing triangle, and earth with a square or cube. (Fraim, XII, 2)

Additionally, water is often used as a symbol in main literary themes or genres. For example, flowing water has been used to symbolize the passage of time, fertility, nature, sense of loss, boundaries, or roadways into foreign civilizations. (Fraim, XII, 6) To that end, Fraim explains that it is "the great movement of rivers which have given rise to labeling them with personalities and seeing them as symbols for the progression of life itself from small bubbling mountain streams to raging youth to death at their conjunction with seas and oceans." (Fraim, XII, 6) Another example of water used as a symbol in literary genre is Mark Twain's *Huckleberry Finn*, where the Mississippi River provides Tom Sawyer an escape from civilization and familiarity. Further, an example of water symbolizing a source of life and a connection to the outside world for characters living in cities on rivers can be found in Twain's *Life On The Mississippi* where packages arriving from St. Louis breathed life into city dwellers.

Finally, water's unique, ever-changing physical nature offers another explanation for its intimate connection with humans. Water is a dynamic, shapeless element that is found as a liquid, solid, and gas naturally. It is formless and takes the shape of its container. In fact, the earliest landscape designs in various cultures recognized water's unique properties, taking advantage of its reflective nature

and cooling properties, its exuberance and gushing qualities, its ability to be controlled and quieted, and even for its wildness. (Halprin, 134-35) In its most peaceful state, such as still lakes or ponds, water can evoke feelings of reflection and calmness. This response has roots in the myth of Narcissus, which is based on the hypnotic power of the mysterious reflective surface possessed by water. In fact, according to this legend, this passive state of water served as mankind's first mirror. The myth explains that when Narcissus saw his reflection in a pool of water, he did not realize that he was in fact seeing his own image. He immediately fell in love with the beautiful person in the reflection. Later realizing that the reflection was his, Narcissus was devastated for being unable to fulfill his passion, and chose to die.

By contrast, in its more violent states, such as floodwaters, rainstorms, and tsunamis, water can evoke feelings of fear and powerlessness. Water's seemingly uncontrollable force can have devastating effects upon mankind. Mysterious deep waters, on the other hand, fill the imagination with ideas of a foreign world below. Further, some of water's most beautiful forms are created when combined with other varieties of nature, such as waterfalls and rainbows, bringing about feelings of happiness and awe. And finally, at a more basic level, physical contact with water causes an array of emotions, such as a cooling effect on the hottest of days, and a chilling effect on the coldest.

Ultimately, water's critical role in religion and philosophy, its symbolic effect in literature, and its unique, ever-changing physical nature explain, in part, water's ability to evoke a broad range of emotions and imaginative experiences upon contact, making accessibility to it a key consideration in urban waterfront development.

History of the Waterfront Disconnect

Over the last few centuries, the economic importance of the urban waterfront has come full circle: beginning with successful city centers reliant on the booming shipping industry, leading next to a decline as businesses generally moved inland, followed by the more recent efforts to revitalize and reconnect the urban waterfront. In order to understand how the siting of buildings, transportation infrastructure, and flood control measures in urban waterfronts affect the experience people have when frequenting these locations, the history of the American urban waterfront and the processes that governed its development must be taken into account. As waterfronts evolved, three categories of functional entities have distanced people from the waterfront: flood control structures, poorly sited buildings, and transportation infrastructure.

A Citizen's Waterfront

From the United States' inception, land surrounding protected harbors accommodated many of the nation's first settlers as ports were their only connections to the outside world. (ULI, 2-3) As the shipping industry thrived, colonial waterfronts like Boston, New York, Philadelphia, and Charles Town soon grew into sophisticated seaports and became the centers of activity for the adjacent areas. (ULI, 3) Waterfront development, however, was by no means limited to seaports. Rivers, lakes, and canals provided popular and economic modes of transportation for people and cargo alike, and the waterfronts of Chicago, St. Louis, and Pittsburgh developed along with their accompanying cities. (ULI, 4-6) In the early days of these new nautical cities, waterfronts were the centers of economic, social, and intellectual life, offering a marketplace for ideas as well as goods. (ULI, 3)

Buildings: The First Barriers

A conglomeration of buildings was often constructed within growing cities, and shoreline roads began to offer services to shippers. (ULI, 8-9) The commercial buildings that were built on the water's edge were often sited with their backs to the water and addressed the street only, effectively obstructing the general public from the water. Manufacturing facilities on the waterfront were also built facing away from the water in order to emphasize the street entrances and to allow waste to be expelled directly out of the building rear and into the water. Given that the waterways behind industrial buildings were severely polluted, the buildings themselves did not allow for views or physical contact with the cesspool below. These waterfronts offered economic and industrial contact with the water but failed to provide public access to the water for people. In most port cities, a wall of warehouses created an impenetrable barrier to the water's edge, forcing the city dwellers who were separated from the waterfront to find a substitute for open space within the city confines. (Kelman, 151)

Transportation Infrastructure Forms a Barrier to the Waterfront

As railroads popularized and expanded, port cities without sufficient unused land to support railroads suffered. Those areas that did accommodate railroads, however, expanded greatly through land filling, often designating large amounts of waterfront land for tracks and specially-designed docks, further separating the central city from the waterfront. (ULI, 8-9) A tight network of rail and water transportation was achieved during the late 19th and early 20th centuries when industrial use of the urban waterfront reached its peak, but the infrastructure that made efficient economic waterfront functions possible created a barrier between cities and their waterfronts. (ULI, 10) Rapid port expansion was followed by a decline in waterfront usage as the shipping industry shifted to "containerized" cargo, which increased both the weight and size of ships, thus eliminating the usefulness of shallow or narrow waterways. (Breen and Rigby, 13; ULI, 10) As ports moved downstream to deeper water, many waterfronts were left unused, lined with abandoned piers and warehouses, which maintained a barrier between people and water. (Otto, 3) In addition to changes in the shipping industry, post-World War II technological advances,

specifically dramatic increases in highway construction and the proliferation of trucks and automobiles, lead to the neglect of previously-thriving industrial waterfronts. (Breen and Rigby, 10; ULI 10) The rise of the trucking industry, in particular, encouraged firms to move to modern suburban facilities, distracting focus from the city center and its waterfronts. (Otto, 3) Newly abandoned waterfronts were reconfigured for uses that rarely increased accessibility for city dwellers. Buildings were often razed, and the land was transformed into parking lots, storage areas, and massive high-speed commuter highways, and not developed for uses such as public recreation. (ULI, 10)

Flood Protection Distances People from the Waterfront

Waterfront cities were generally settled as close to the water as safely possible because industry and commerce heavily relied on water for power, waste expulsion, and the transport of goods. (ULI, 3) This was problematic, however, because the areas near the waters edge were commonly located in the natural floodplain of the waterway. Therefore, cities had to construct flood control structures to ensure that the downtown areas did not flood and cause severe economic loss in an area of great investment. Many different types of flood protection structures were built to guard cities. Levees, flood walls, and deepened channels are three common protective structures found in urban areas. These structures often are designed to distance water from built structures and are consequently a barrier between people and water. Levees are constructed mounds of earth that create raised banks on the water's edge. Flood walls are vertical structures that take up less space than levees and perform two services: creating a larger vertical bank to hold higher floodwaters and giving structure to the bank to guard against erosion. Deepening a river channel is a process where the river is dredged to lower the water height instead of building up the sides to hold more water. Although flood control measures insure against economic loss in downtown commercial areas by creating a greater distance between bank edges and water surfaces, the same structures also guarantee the public is further distanced from the water.

Finally, the treatment of the industrial waterfront left urban waterfronts across the United States in general decline, a trend captured by Roy Mann in *Rivers in the City*, stating that the urban river is "the most intensively used, most often abused resource on earth." (Mann, 13) The water and waterfront lands were left polluted by the now absent industry, which created a barrier between water

and the public. Also, the deficiency of public access due to run down and dangerous industrial sites or impassable highways limited the community's contact with their local urban waterfronts. (Otto, 3)

Factors Concerning Intimacy

In order to generate design guidelines for creating an intimate waterfront, one must consider the psychological, phenomenological, and cultural approaches to understanding the experience of the water's edge. A psychological approach addresses the preferences people have for being near water safely. A phenomenological approach addresses the subjective experience of the waterfront environment, manifested through the senses. A cultural approach addresses the spatial patterns that elicit archetypal cultural responses. Each of these approaches helps create a mode of analysis of existing waterfront developments, and they remedy problematic situations by guiding decisions regarding the design of waterfront environments.

Behavioral Psychology

Understanding the reasons for human behavior is an effective tool for designers of public spaces because people's preferences will ultimately determine if a space is successful and, therefore, will determine the effectiveness of the design. In *With People in Mind*, Rachel and Stephen Kaplan use behavioral psychology to determine personal preference for outdoor spaces. More specifically, the Kaplans examine "the way the natural environment can foster well-being and can enhance people's ability to function effectively." They also explore "the design and management of nearby natural areas in ways that are beneficial for people and appreciated by them." (Kaplan, 1) In their study, the Kaplans discuss various preferences concerning waterfront development. For instance, polluted water detracts from a "scenic setting" and an unkempt appearance of plants, even if they are essential to water health, can be unsettling for waterfront users. Further, the water's edge can be perceived as less attractive if water overflows its edge. Although eroded and unkempt edges are not preferred, hard-surfaced bank treatments score even lower preference ratings. The Kaplans found that preferred water edges, on the other hand, often contain a water element and follow a natural form, rather than having constructed straight edges. Users prefer vegetative banks for appearance and performance enhancement. (Kaplan, 113-114)

Using mostly film and time-lapse photography to document human behavior, William Whyte, in his book *City: Rediscovering the Center*, also draws conclusions about preferences in the urban fabric and touches upon the use of water in public spaces. Whyte

is an advocate for immediate accessibility, stating, "it's not right to put water before people and then keep them away from it." (Whyte, 139) He expands on the importance of intimacy with water in the following excerpt:

> "One of the nicest things about water is the look and feel and sound of it. I have always thought the water at Seagram [Plaza] looked unusually liquid, and I think it is because you know you can splash your hand in it if you are of a mind to. People do it all the time; they stick their hands in it, their toes and feet, and if they splash about, some security guard does not come running up to tell them nay." (Whyte, 138-139)

Phenomenology

Phenomenology is defined as a philosophy or method of inquiry based on the premise that reality consists of objects and events as they are perceived or understood in human consciousness and not of anything independent of human consciousness. Gordon Cullen uses this point of view in *Townscapes* to argue that the experience a person has in a place is almost wholly dependent upon what they see and, consequently, the visual qualities of a place should be the most important factor involved in design. People experience a place through a progression of views that Cullen termed "serial vision." His observations regarding these experiences touched upon the idea of immediacy and why it is important in the treatment of the water's edge. As demonstrated in the earlier example involving the difference between having fifty dollars remotely versus within reach, Cullen argues that knowing something exists is not as exciting or interesting as having that something within arm's reach. Cullen points to water as the most obvious example of the importance of immediacy because of its "psychological contrast" at the transition to dry land. The individual who stands on the shore feels a tension and concentrates on the line where land meets water. Touching on solutions that reconnect people with water by way of design, Cullen states that a way to achieve intimacy is to remove or omit railings in designs to allow users to lean out over the water. In fact, Cullen suggests that a way to define immediacy can be a "mental leaning-out-over." (Cullen, 189-191) The smooth transition from land to water results in a pleasant waterfront experience.

CHAPTER 3: DESIGN GUIDELINES

Cultural Archetypes

Environmental forms or patterns that are revisited from generation to generation may be considered cultural archetypes in design. Christopher Alexander in *A Pattern Language* points out design problems that occur frequently in our environment and suggests design guidelines, or environmental patterns, derived from study of vernacular environments that have provided solutions to those problems. Addressing common waterfront problems, Alexander mentions that industries, roads and freeways block or destroy the water's edge, and as a result of these waterfront uses, the water is so dirty or treacherous that it is basically inaccessible. He notes that it is natural for humans to want to build near water, but argues that the land immediately along the water's edge must be preserved for common use. The width of the land adjacent to the water should depend upon the type and size of the water, the ecological conditions of the shoreline, and the density of the existing development. Alexander warns that dense developments should be controlled, as they can lead to limited accessibility. Similarly, roads that can destroy the water's edge or keep people from enjoying it should only be constructed at right angles to the water, and parking lots should be limited in size.

When considering water in any form in a city, Alexander states that swimming pools, lakes and beaches are few and far apart, and exposure to water from the tap hardly satisfies the emotional urge to make contact with bodies of water. Alexander imagines a city where there are hundreds of places for people to enjoy water near their homes, with plenty of opportunity for swimming, dangling their feet, or merely observing, instead of cities where streams and brooks are covered to make way for a street grid. He calls for intimate designs to include shallow pools and ponds in which children can play, paths for people to walk along the water, and footbridges to cross over the water.

Flood Control Measures

Flood walls, levees, and deepened channels, by design, create physical barriers and distance between the waterfront and its visitors. In order to increase intimacy with the water, riverfront designs must allow for greater physical, audible, and visual contact. The Kaplans' research suggests that people prefer natural curvilinear shores rather than straight, hard edges. They also find, however, that people prefer manicured vegetation instead of natural growth on shorelines. As explained earlier, the engineering of shorelines is usually instituted because of the necessity to protect high investment urban areas. Therefore, a completely natural bank in an urban area is not usually a viable option. Therefore one design guideline would *require engineered banks be curvilinear and possess the physical qualities of natural banks*.

Specifically, creating a curved shoreline, even if it is made of concrete, will be a more attractive organic form for waterfront users. The inclusion of plant material that can sustain life through floodwaters creates a waterfront with natural elements that can draw users to the edge.

Whyte found that when people are in the presence of water, they like to be close enough to touch it. Alexander also calls for water features and bodies of water for people to interact with. The need for flood control can be met in ways that do not limit accessibility. Therefore a second design guideline would *allow people to have immediate physical access to the water through the elimination of steep sloped or vertical banks.*

Specifically, the water's edge can be terraced to create a sequence of ledges that can be traversed by waterfront users. A terraced bank provides accessibility to waterfront users regardless of the water's height. Also a terraced edge allows a bank to protect against both high water events and erosion. Another example of how to eliminate large, steep slopes or vertical banks is to use underground culverts to expel floodwaters. This treatment allows a constant water height while any overflow will be directed into subterranean channels. The constant water height allows designs to have a minimal bank treatment, which in turn, provides close physical contact with the water below. The installation of a removable flood wall system is also a way to provide accessibility during times of normal water height while protecting the area during floods or high waters.

Buildings

Buildings will always be a factor when considering an urban waterfront, so the treatment of these barriers is critical. Older buildings are often found very close to the water's edge, and they rarely focus on the waterway. If a building is built too close to a river, the edge is too straight, and the transition is too abrupt. The Kaplans warn that people dislike straight and abrupt edges. Therefore a third design guideline would *require modification to the area between building and waterway to reduce the effect of the existing barrier*.

As previously stated, many waterfront buildings focus on the public on the street without regard for the water at their back doors. These buildings should provide entrances from the street and the waterfront, and water views should be a major design consideration for the interior. Also, many older urban waterfront buildings sit very close the water's edge. These situations create an opportunity for intimacy along the river. Various riverfront businesses, such as restaurants, will benefit from a location close to the water's edge and should maximize views to the water since their patrons are stationary while dining. A small area sandwiched between a building and the water provides a place for an intimate interaction

with the water that is also removed from the busy life of the street by the proximity of the building.

Alexander argues that there should be limited or no building on the water's edge, and that the area next to a river should be set aside for community access. Cullen argues for creating pleasant transitions between the street and the waterfront, through inviting views and avenues that directly connect rivers and streets. Therefore a fourth design guideline would *allow for intimate views and connections between water and city by razing buildings that are beyond repair or block important views, and site new buildings which are sensitive to these views and connections.*

When buildings can no longer be renovated because of neglect and disuse, designers should consider demolition. The newly opened land creates opportunities for new, better sited and designed buildings, or greenways and parkland, to allow visual connections between the streets, residences, and businesses and the riverfront in order to promote accessibility and intimacy. (Otto, 45) A strategic place for new connections to the waterfront should be perpendicular roads where there is an elevated position for an overlook.

Transportation Infrastructure

When dealing with waterfront developments near railways, highways or roads, and parking lots, transportation infrastructure must be integrated within the development in a way that will not prevent physical and visual connection to the water and will promote intimacy. (Halprin, 65) Alexander warns against parallel roads because they severely limit public access to the waterfront, but in many urban waterfronts, parallel roads already exist and are important transportation routes. Therefore a fifth design guideline requires *parallel roads or highways be traversed by pedestrian connections to maximize accessibility to the waterfront.*

One solution is to remove highways, railways, and parking lots from downtown waterfront areas. This may meet strong opposition because these transportation structures are usually important for commerce. These structures would not be barriers if constructed underground. If there is a sufficient grade change between one side of the transportation structure and the other, a deck could be built above it to create a seamless transition from land to water. Another common treatment that allows pedestrians to cross busy

streets and highways is the addition of pedestrian bridges, but this is economically feasible only where high density supports it.

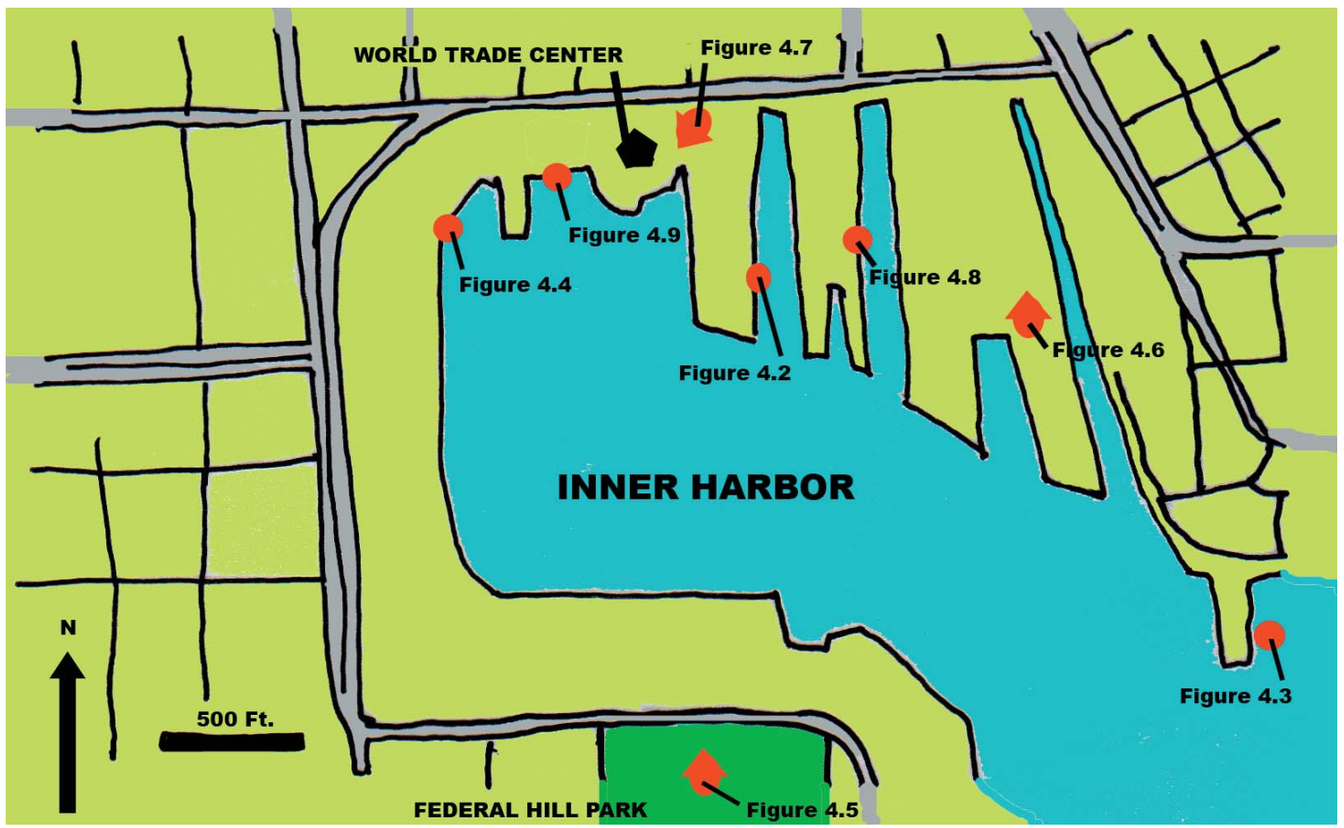

Figure 4.1. This plan view of the Inner Harbor can be used as a key for the photos associated with this case study.

Waterfront Redevelopment Case Studies

The following case studies were conducted by taking into account the previously discussed design guidelines while analyzing the sites during site visits. Further, the following specific questions, which were formulated using the design guidelines, were answered with

Figure 4.2. A boat docks at one of the piers.

Figure 4.3. The dock is anchored by poles, so it can move vertically.

regard to each case study site.

Figure 4.4. Amphitheater style seats create seating/viewing areas.

Waterfront Questionnaire

1) **Does the waterfront allow for physical contact and/or accessibility? How?**
2) **Does the waterfront take advantage of water views? How?**

Figure 4.5. The view from Federal Hill Park surveys the harbor.

3) Does the waterfront take advantage of water sounds? How?
4) Are there effective flood control structures in place?
    a. What are they?
    b. Do they allow for physical contact and /or accessibility?
5) How is the water's edge constructed?
    a. Natural/Built
    b. Straight/Curved
    c. Vegetative/Hardscaped
6) Are there buildings located on the water's edge?
    a. Do they address street/water/both?
    b. Do they physically or visually block the waterfront?
7) Is there transportation infrastructure on the waterfront?
    a. Does it physically, visually, or audibly block the water?
    b. Can it be safely circumvented?
    c. Are there waterfront parking lots?

Figure 4.6. The parking garage (right) posseses waterfront architecture.

Figure 4.7. The Baltimore World Trade Center allows views to water through glassed in ground floor.

Inner Harbor – Baltimore, Maryland

The story of the Inner Harbor in Baltimore, Maryland has become "the classic tale of modern times." (Breen and Rigby, 1996, 25) Started in 1963, this renovation is

considered the first successful major waterfront revitalization. The reconstructed waterfront space includes a science museum, a major aquarium, extravagant hotels, a large park, paddle boats, ferries, and waterside restaurants that are all connected by an open-edged brick, stone, and concrete walk that is thirty-five feet wide. The success of the revitalization can be attributed to a design that ensures physical, visual and auditory intimacy between the public and the waterfront. The design also takes steps to increase access to the water's edge with specific design considerations addressing the existing functional barriers.

More specifically, this waterfront allows for physical contact with the water in a number of ways. There are places for boats to tie to piers for direct interaction with the water. There are ladders to the water level that allow boaters to transfer from vessel to land. Another boat docking solution present is a floating dock system that raises and lowers with the tide by moving vertically on large poles. This allows for an immediate experience since the waterfront user is only about a foot away from the surface of the water at all times.

In addition to physical intimacy, there are also many places from which visitors may take in the rich views while visiting the Inner Harbor. The grandest view can be seen from the observation deck of the Baltimore World Trade Center, which is the tallest pentagonal building in the world. After entering a gate-like

Figure 4.8. Children observe the water from a pedestrian bridge.

Figure 4.9. Paddle boat rentals are available.

structure at the southwest corner of the harbor, an amphitheater styled plaza invites pedestrians to sit and take in the view. Another extraordinary view comes from the top of Federal Hill Park just south of Harbor. All of the waterfront restaurants have seating areas inside and outside that take full advantage of the views. A retail store usually relegated to a big box in the suburbs is located in a taller building on the adjacent street to the waterfront. Unlike the company's usual setting, this store allows consumers to view the harbor while shopping.

Besides physical and visual intimacy, the harbor is filled with the delightful sounds of nature, from the gentle lapping of waves to seagulls screeching overhead. The peaceful serenity of a February day observed during the case study visit would also be accented by the rhythmic sounds of boating on a July afternoon.

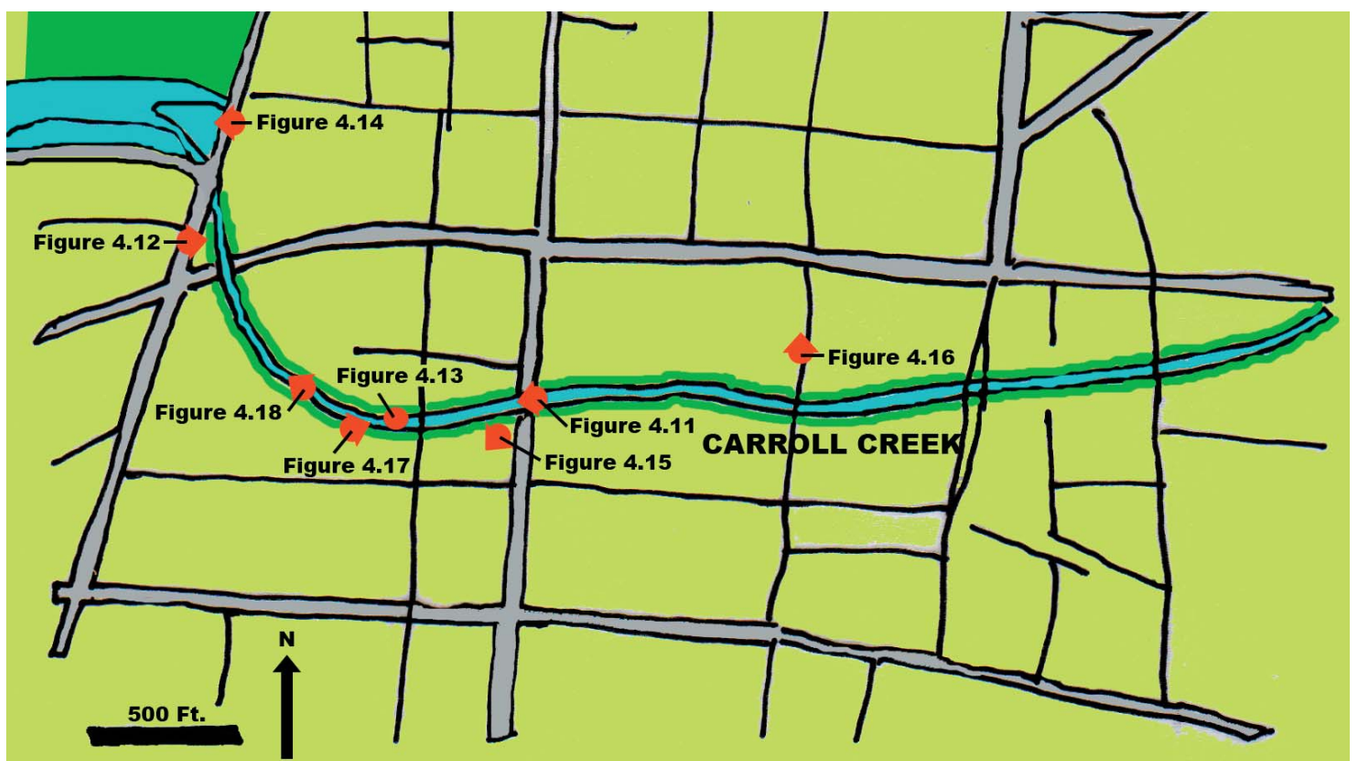

Figure 4.10. This plan view of Carroll Creek in Frederick, Maryland can be used as a key for the photos associated with this case study.

As for existing physical barriers, the Inner Harbor revitalization area does not have any interfering flood control structures, but a sea wall is present and creates a distance of up to ten feet between waterfront users and the water below. However, this distance is softened by the ladders that provide access to the water's edge.

The water's edge is constructed of stone and wood in straight lines. There is vegetation located in planters that are both above and

Figure 4.11. Carroll Creek is a concrete lined channel.

Figure 4.12. This bench is one of many found along the creek.

below ground along most of the harbor walkway.

There are buildings on the water's edge, and they do address the street and the water. The buildings help create connections with the water through uses of interesting architecture with nautical ornamentation. Some examples are the parking garage that slightly resembles a cruise ship from afar, the National Aquarium that has portholes for windows, and the World Trade Center that has a small first floor with glass that allows for views for the street level pedestrian.

There are wide, heavily-traveled roads and parking structures on the waterfront. Some steps have been taken to allow pedestrians to bypass the roads. Highway 295 enters the downtown as a full speed highway, but as it nears the harbor, the traffic slows and stoplights allow for safe crossing. There are also pedestrian bridges that allow for crossing the highway, but the road is so wide and congested that some people are hesitant to cross.

There are other notable details of the Inner Harbor related to issues of intimacy. As a pedestrian walks along the water's edge up and down the piers, there is a feeling of mystery and discovery around each turn, which creates a pleasurable experience. Also the water's edge is lengthened because the piers extend into the water. This increased distance allows more development to be located directly on the water, creating more intimate experiences. Pedestrian

Figure 4.13. This small dam creates a sound that can be heard nearby.

Figure 4.14. The above ground creek on the left goes downtown while floodwaters fall to the basin below and into underground culverts.

bridges connect the piers near their ends, so people do not have to walk to the shore to visit the next pier. People can also sit on benches near the water's edge to observe the water. There are also informational signs with historical accounts of the area that give the user information on the rich history of the waterfront. Rental boats and water taxis are available for use, which allows users to be able to interact with the water physically.

The Inner Harbor of Baltimore is a successful waterfront development catering to many interests. This study found that the most waterfront amenities provide for an intimate waterfront experience.

Figure 4.15. This waterfront parking lot sits close to Carroll Creek.

Carroll Creek – Frederick, Maryland

Frederick, Maryland's second largest city, was established in 1745. The downtown area built up around Carroll Creek, and many of the core buildings were erected before 1800. Carroll Creek was known for its flooding, and in 1976

Figure 4.16. Narrow alleys lead to Carroll Creek from downtown points.

a one hundred-year flood destroyed one hundred downtown buildings, costing the city over twenty-five million dollars in damages. This tragic event led to a sixty-five million dollar engineering project that redirected over a mile of Carroll Creek into subterranean channels leaving a small exposed creek above ground. Presently Frederick is in the process of finishing construction of a river walk along Carroll Creek. The physical, visual and auditory intimacy of Carroll Creek was improved during the redesign. Barriers were redesigned for dramatic effect, and the water's edge was softened.

More specifically, the waterfront allows physical contact with the water in different ways. Carroll Creek flows through a shallow

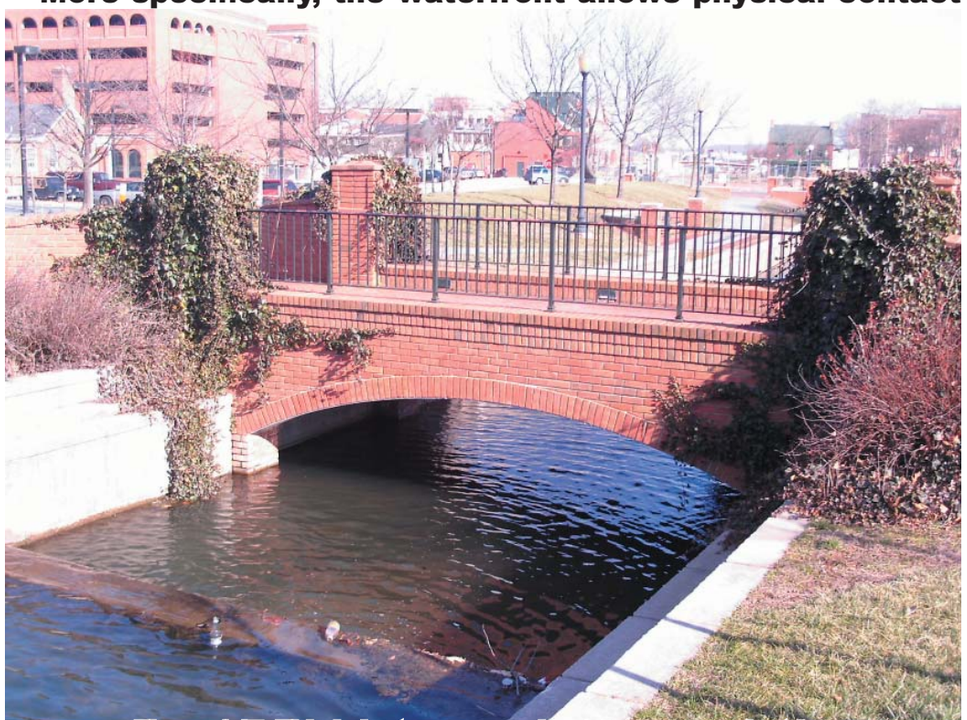

Figure 4.17. This is just one example of the many pedestrian bridges found throughout Carroll Creek

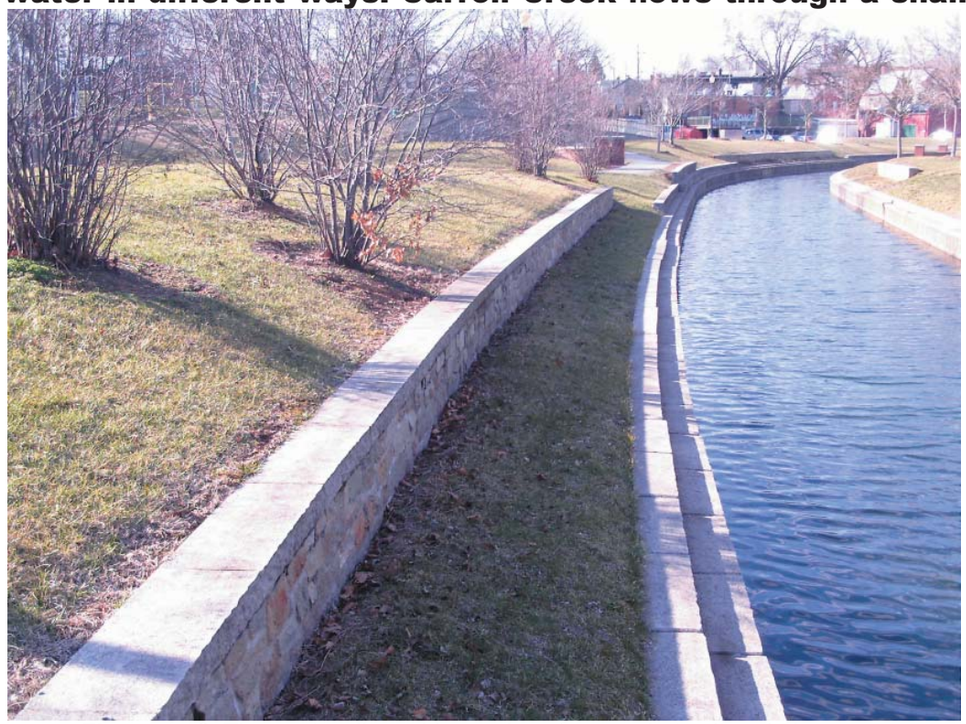

Figure 4.18. The seat wall provides a place for people to sit and observe.

concrete lined channel. The water's surface is about two feet below the top of the wall, so people can touch it if they so choose. There are also areas where steps allow closer contact with the water that can be used as seating. One of the design intentions of the project is to allow kayaks, canoes, and paddle boats to move through the design.

In addition to physical intimacy, visual intimacy is afforded by the waterfront views from many pedestrian bridges along Carroll

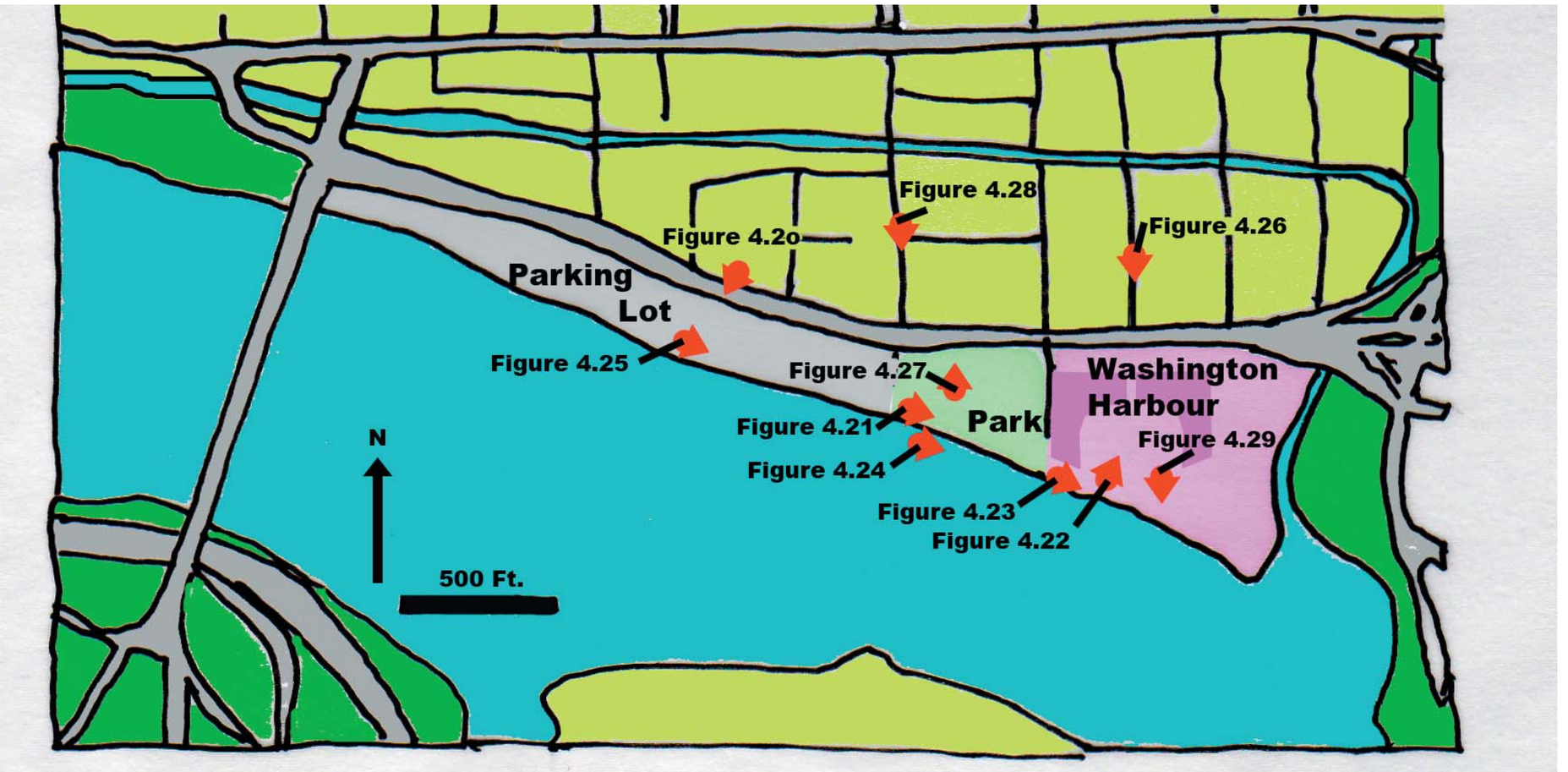

Figure 4.19. This plan view of the Georgetown waterfront can be used as a key for the photos associated with this case study.

Creek. However, there are not many views from outside the river walk into the Carroll Creek area because of the small streets and closely situated buildings.

Besides opportunities for physical and visual intimacy, currently the site also offers one place for auditory intimacy where the water can be heard dropping over a small dam in the older section of the creek. The new development, however, will have fountains and gushing water cascading into the creek. Also, the sound of the water falling into the basin at the beginning of the flood control area is quite interesting.

As for existing physical barriers, the main flood control feature in the Carroll Creek development is the underground passage for floodwater. This functional process also creates a surprisingly stunning waterfall in the park to the north of the river walk. The flood control construction also keeps the surface of Carroll Creek in downtown Frederick at a constant height allowing the design to provide immediate access to waterfront users consistently.

In addition to the flood control feature, the water's edge in the older part of the river walk is constructed with custom concrete block that is placed to create a sinuous creek edge. Above the block on the banks are trees, shrubs and turf. The creek edge is made of mortared stone that is straight at some points, but

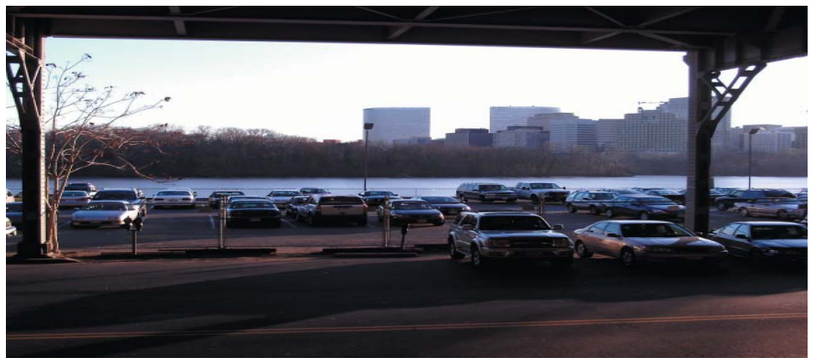

Figure 4.20. A private parking lot disconnects people from the river.

Figure 4.21. A riverfront park offers some views of the Potomac River.

Figure 4.22. The Washington Harbour development houses offices and popular riverfront restaurants.

mostly has a slight curve. There are brick terraces and stone walks that will be complemented by plantings in raised beds.

There are many buildings sited near the water's edge. Most are very old and do not focus on the water as well as they concentrate on the street. There are some newer buildings, such as the arts center, that take full advantage of the waterfront location and may actually focus on the water better than the street. The compact row house type of development of the downtown area is a barrier next to the water. There are few solely pedestrian connections from the adjacent parallel streets, so a person could be walking down the adjacent street and not realize there is a waterway beyond the buildings. The only pedestrian connection to the water is through perpendicular streets.

The streets in downtown Frederick are narrow, and the streets that are perpendicular to the water do not allow visual access because buildings block the

Figure 4.23. Boats tie to the boardwalk during the warmer months.

Figure 4.24. The wall at the waterfront park distances people from the water.

Figure 4.25. The fence at the river's edge blocks access to the river.

views. The parking structures located downtown are not located on the waterfront, so they do not limit the intimate experience of the water. The parking lots directly adjacent to the waterfront are small.

The Carroll Creek development also has many pedestrian bridges that give new perspectives on the creek and town. There are many places that are close to the water's edge for people to sit and observe the water. These waterside seat walls, grassy knolls, and benches all create places for intimate experience.

Overall, the Carroll Creek development fosters an intimate relationship with waterfront users and provides the flood control structure that allows people to have close physical contact with the water. However, the waterfront does not fully utilize the transportation infrastructure and the siting of buildings to create intimacy.

Potomac River – Georgetown, Washington, DC

Georgetown was settled on the northern most navigable point of the Potomac River in 1696. It became the staging point for the exchange of goods from the C & O Canal. The waterfront possessed an industrial character by having a lumberyard, a cement works, and a meat rendering plant. In 1949, Washington, DC built the

Figure 4.26. The inviting street entrance of the Washington Harbour is partially blocked by the freeway overhead.

Figure 4.27. These buildings have large windows offering views of the river, but the freeway blocks views from lower floors.

Whitehurst Freeway above K Street to ease commutes into downtown DC.

Today the Georgetown waterfront has three discrete areas: a large parking lot, a little used public park, and the Washington Harbour waterfront development that houses both offices and restaurants. The Georgetown development includes areas of physical intimacy, stunning visual intimacy, and serene auditory intimacy. While there are some interfering barriers, the water's edge has been developed complete with a building that takes full advantage of its waterfront location. Roads and freeways do not provide easy access to the development and block some views.

More specifically, the Georgetown waterfront allows for a high degree of physical contact at the Washington Harbour on the east side, then gradually becomes less intimate as one moves to the western edge of the parking lot. The Washington Harbor offers space for boaters to tie to the edge, so they can eat a meal or experience the nightlife. The water is between two and three feet away from the top of the boardwalk, so people can touch the water if they choose. The park that is located between the harbor and the parking lot includes a tall wall that places the user at least ten feet away from the water's surface. The parking lot has a wall at its edge too, but it also possesses a fence to guarantee isolation from the water.

Although the three waterfronts of Georgetown vary in physical accessibility, the Washington Harbour waterfront development boasts natural visual intimacy. The waterfronts offer views of the Potomac River that are especially serene at

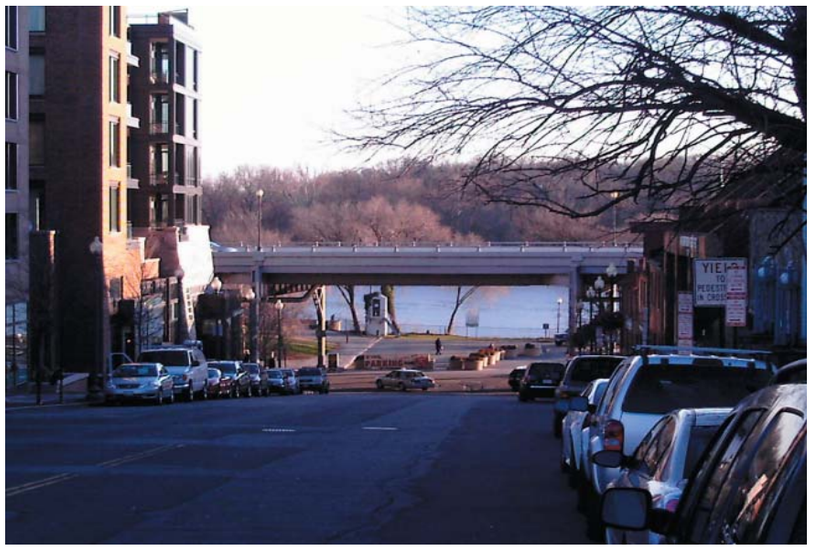

Figure 4.28. The Whitehurst Freeway blocks views from perpendicular roads to the river.

Figure 4.29. People enjoy the view at the Washington Harbour.

sunset. A person cannot help feeling engaged with the river when the setting sun is reflected off of its shimmering surface. There is also a view of the Kennedy Center and a glimpse of the Lincoln Memorial to the east.

In addition to physical and visual intimacy, the Potomac is fairly calm near the Georgetown waterfront, making auditory intimacy from the river noise limited. There is a large fountain in the center of the courtyard creating sound that reverberates through the space and provides a pleasant reminder that there is water near, even if it cannot be seen.

This waterfront is not free of existing physical barriers, the tall walls at the parking lot and the park could be considered flood protection.

The water's edge at the Washington Harbor is constructed of wood with straight edges and a circular central portion. There is no vegetation near the water's edge. The park and parking lot both have a straight concrete edge. The park's edge is concrete with plant material located away from the edge, compared to the parking lot that has volunteer trees living in the small space between the concrete wall and the asphalt pavement of the lot.

The only building located on the water's edge is the Washington Harbor complex, and it focuses on both the street and the river. The street entrance is a central promenade with a circular automobile loop for passenger pick up or drop off. The river side of the complex is open and lined with windows on every floor. The building also has curved windows that have a nautical theme. The restaurants in the complex are located on the ground floor with expansive windows and large areas for outdoor dining and gathering. Conversely, in the parking lot, there is a small shack that houses the parking attendant that does not address the street or the river. There are buildings on the adjacent K Street that have large windows to take advantage of the view, but some views are blocked or ruined by the Whitehurst Freeway that runs above K Street.

The Whitehurst Freeway is an easy way for commuters to reach downtown, but it blocks views to the river from adjacent buildings and perpendicular streets. It is not a physical barrier to the river though, because it is located high above the pedestrian plane. The

perpendicular streets end at K Street, and there is no physical connection from the terminal points of the streets to the water. The private parking lot on the waterfront blocks any access to the water with a sea of cars and a fence that surrounds the property.

The Georgetown waterfront offers an intimate waterfront experience at the Georgetown Harbor development, but it lacks immediate access to the river from the park and the parking lot. The freeway also acts as a barrier between the waterfront and the rest of the city.

Figure 5.1. The freeway blocks views to the Potomac River.

Figure 5.2. The floodwall distances people from the river.

Figure 5.3. The building's architecture does not focus on water.

CHAPTER 6: DESIGN PROJECT SITE

This design project tests the findings of the design guidelines previously outlined in Chapter 3. The site for the design serves as a prototypical waterfront where the design guidelines could be applied. The site chosen for this project is the downtown waterfront in Janesville, Wisconsin. Janesville is located in south central Wisconsin about 30 miles north of the Illinois border.

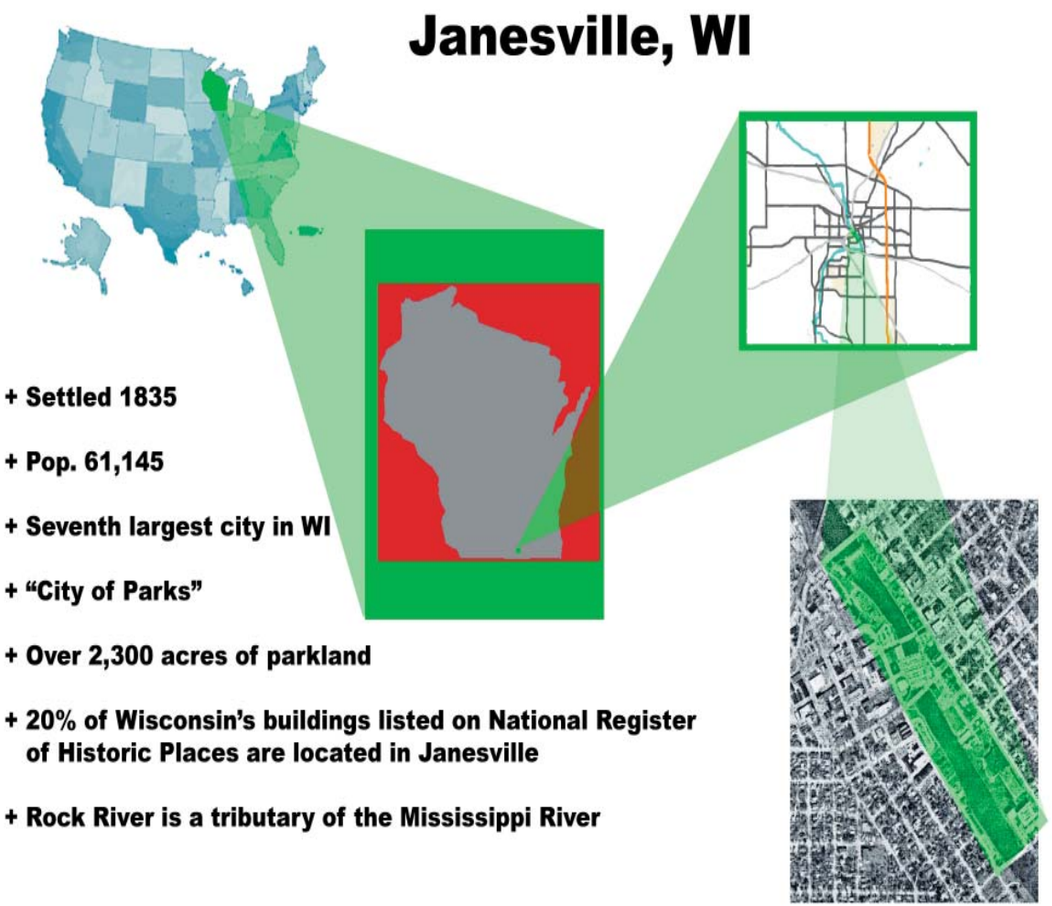

Figure 6.1. Select Janesville facts.

Why choose Janesville?

Downtown Janesville was at one time a busy, exciting place where Janesville citizens and visitors from area towns would converge to work, purchase goods, and seek entertainment. However, for the last 40 years, businesses have been moving out of downtown Janesville to the indoor shopping mall and other properties close the interstate highway that connects south to Chicago and north to Madison. Commercial development near the interstate highway is still booming, while downtown commercial businesses continue to struggle. Industries in downtown Janesville historically used the Rock River to power factories and to expel waste. Most of the industry was located upstream from the commercial area of downtown, so the polluted river was not perceived as a place for recreation or public amenity. This perception can be seen in the way buildings were sited, the flood control measures were constructed, and the transportation infrastructure near the river was planned.

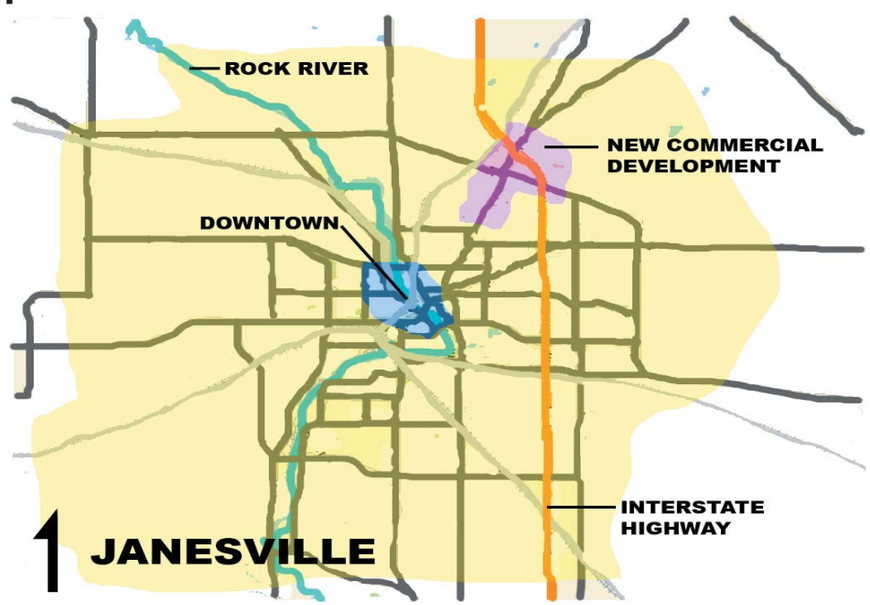

Figure 6.2. Map of Janesville shows downtown and new development locales.

History of Janesville and the Rock River

The land on which present day Janesville stands was a camp for the native Americans before the first white settlers arrived on the banks of the Rock River in 1835. The fertile land and rolling hills of the area attracted more settlers as word spread throughout the country. The county seat was put into place on the land of Henry Janes who also applied for a post office to be named "Black Hawk." The postmaster general approved the post office, but named it Janesville instead. Janes' land was located on the east side of the Rock River at the corner of present-day Main Street and Milwaukee Street.

Janesville became known for its manufacturing industry with facilities devoted to production of cigars, shoes, bricks, and agricultural implements. The Rock River also powered mills for wool, cotton, and wheat. Three rail lines linked Janesville to Milwaukee, Chicago, and other points west.

Janesville's identity as a manufacturing city continued in the 20th century and was based on the large-scale production facilities of General Motors and Parker Pen.

Throughout Janesville's history, the Rock River in the downtown area was used as a tool for manufacturing, but the recreational uses of the river were relegated to points upstream of downtown. As commerce thrived, shops were built along the river facing the parallel roads, either Main Street or River Street. Commercial development reached all the way to the shoreline of the river, so to protect investment in the downtown area, a floodwall was built tall enough to protect against a 100-year flood. This floodwall varies from six feet up to fifteen feet above normal water level. A parking plaza was built across the Rock River at the peak of downtown prosperity, sometime between 1963 and 1970, to provide for increased downtown accessibility. As the interstate highway created a bypass of downtown, the exits to Janesville became the new commercial hubs, and downtown businesses fled for the cheaper land and unlimited parking close to the new hubs.

Figure 6.3. Janesville's typical downtown historic structures have small local shops with residences above.

Janesville Today

Today, business owners and the municipal government are desperately trying to revive downtown Janesville. Big box stores and strip malls near the interstate highway serve Janesville residents as well as the surrounding small communities while commercial entities downtown struggle. The river is still a forgotten element of downtown. There is a river walk that consists of a concrete walkway that runs the length of downtown. The flood walls disconnect people from the river. The riverside buildings face the streets, and the garbage is put out back next to the river. The parking plaza spans the river, effectively negating its existence. If downtown Janesville is going to awaken from its slumber, the river has to become a destination. The Rock River is the reason for the initial settlement, prosperity, and community of Janesville. It has the potential to be the cause for a new age of prosperity and community through the design of an intimate waterfront.

Figure 6.4. Janesville is protected from the Rock River by a floodwall that spans the entire downtown.

Figure 6.5. The buldings on the riverfront turn their backs on the river.

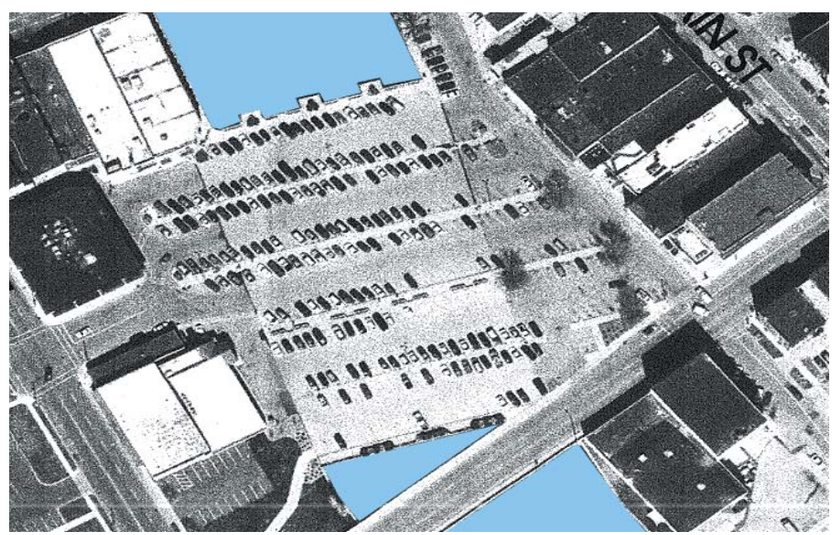

Figure 6.6. A 300 space parking plaza spans the river.

CHAPTER 7: SITE ANALYSIS

The site inventory and analysis presented in the following chapter will give insight into the issues that were found to be particularly important in creating an intimate waterfront experience along the Rock River in downtown Janesville, Wisconsin. There will be brief explanations of the processes and findings exhibited on the many drawings and photos to follow.

Figure 7.1. Intersection of Rock Street and River Street.

Figure 7.2. Initial inventory of downtown area.

The first step in the analysis was to catalogue land uses along the riverfront. This was accomplished with the aid of a land use document provided by the city planning office, and a walk through of the downtown area to confirm those uses. The initial catalogue of downtown identified anchors like the Janesville Performing Arts Center, Hedberg Public Library, Rock County Courthouse, City Municipal Building, YMCA, and Janesville Transit Center that would have to be integrated into the waterfront design. This drawing is color coded to identify property uses for downtown. Important street names have also been identified because they are mentioned throughout the site analysis and design development phases.

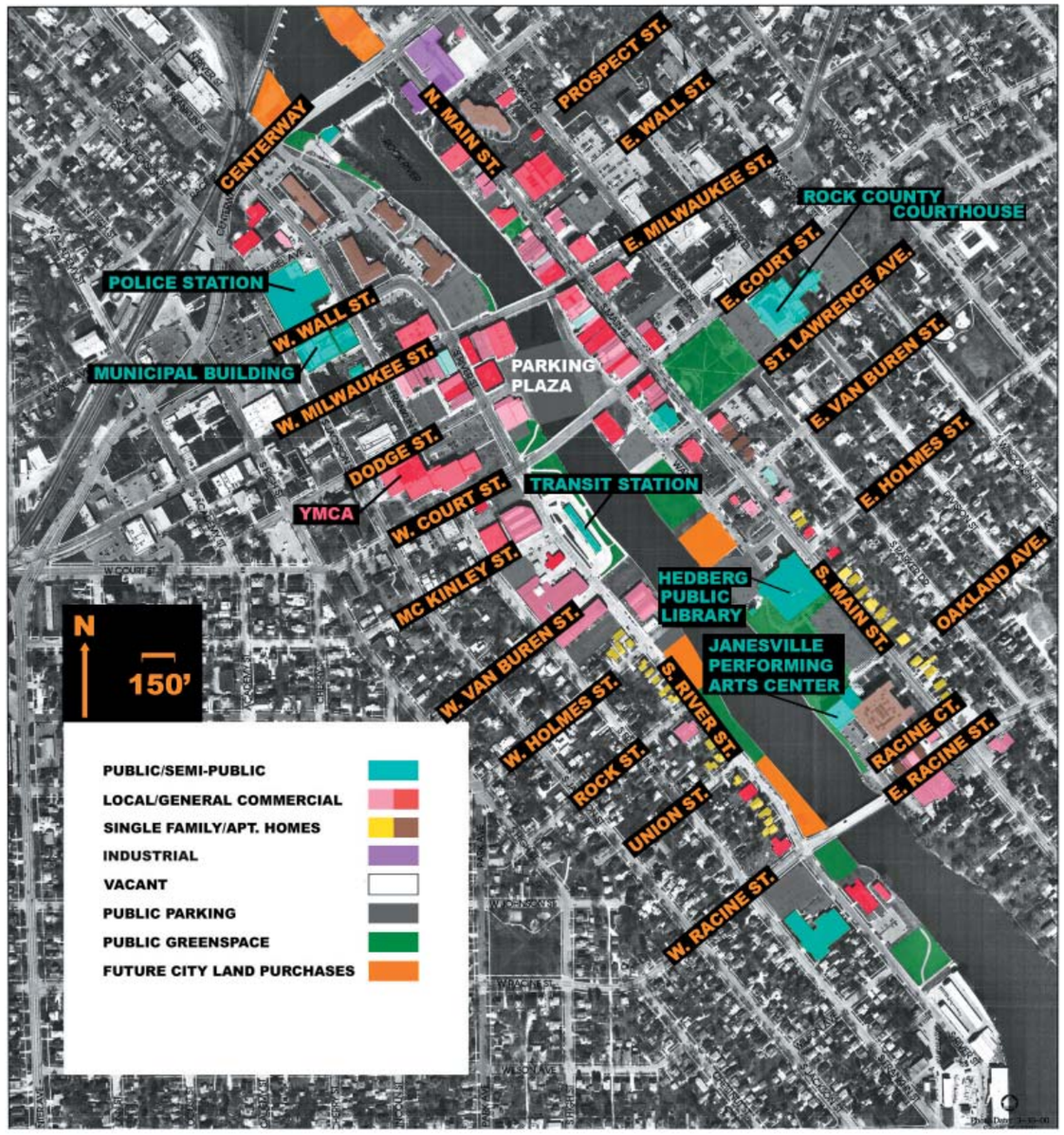

Figure 7.3. Land use map of downtown Janesville.

This land use map shows the historic districts and buildings that are present in downtown Janesville. The 100 year flood plain is shown as a yellow line, and the Ice Age Trail, which is part of a statewide trail system, is shown as a red line. The identification of historic districts and structures is important because historical structures give character to downtowns, and registered historic districts and structures are often protected and preserved. The 100 year flood line is important because new development should continue to protect the downtown from flooding. The new development must also address the connection of the Ice Ace Trail through downtown. The Ice Age Trail (red line through map at lower right) is a state-wide trail system for touring glacial forms.

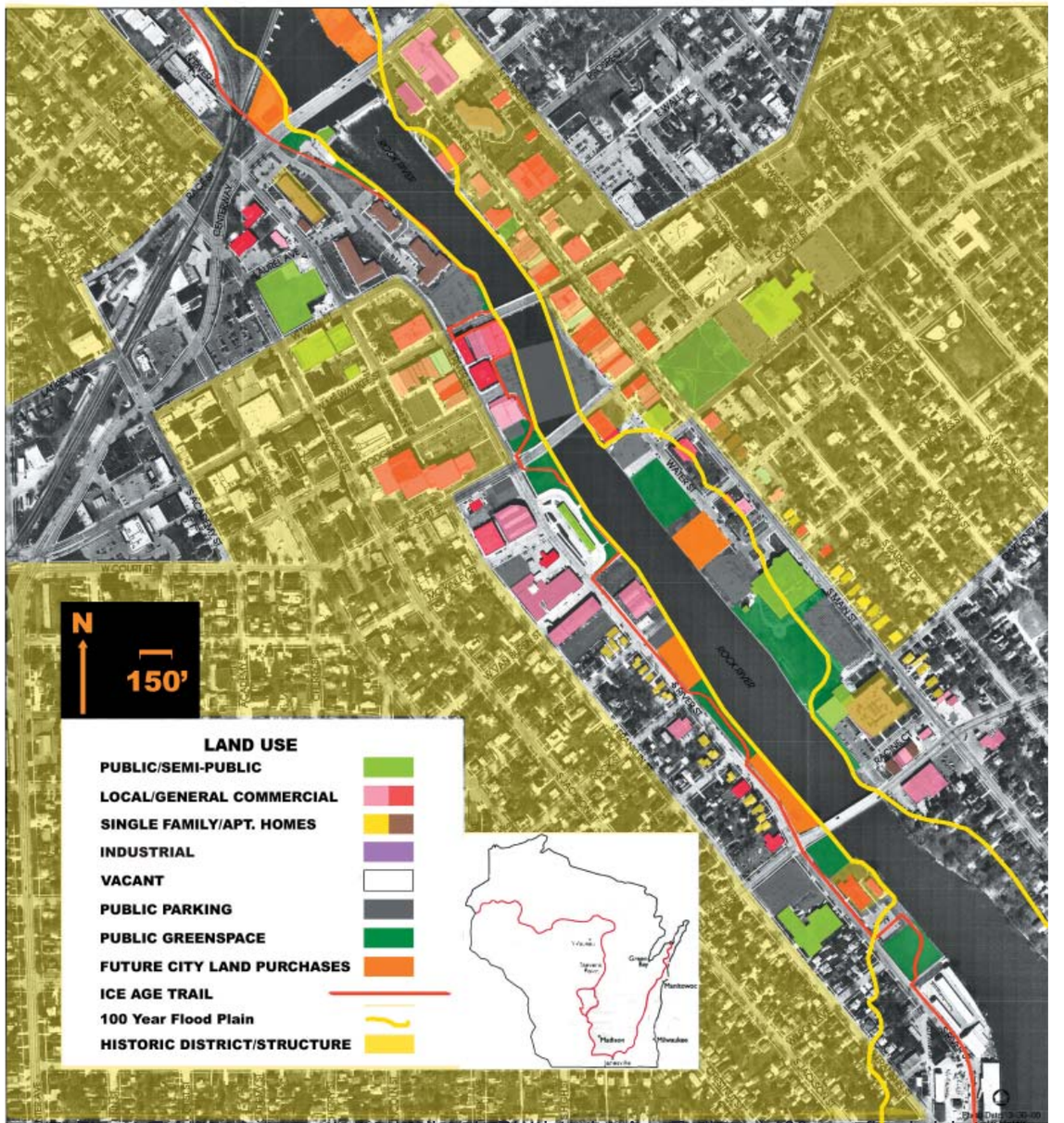

Figure 7.4. Land use map shows Historic Districts, Ice Age Trail, and 100 year flood plain.

The barriers to the river were then identified, so steps could be taken to circumvent them in the new design. These barriers can be seen below marked in red. There are poorly sited buildings, high flood walls, the parking plaza that spans the river, and the dam on the north side of downtown. This dam isolates downtown Janesville from points north. The Rock River is used for recreational boating and water skiing throughout the summer months from north of the dam on upstream. There is no boating on the Rock River in downtown Janesville.

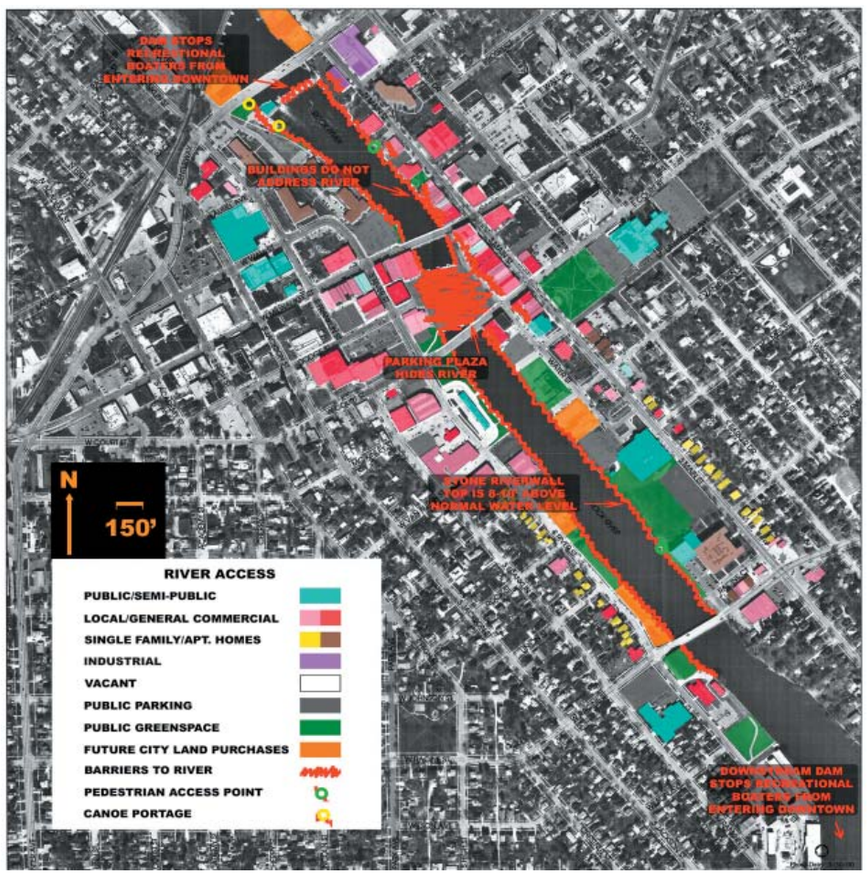

Figure 7.5. River access.

A phenomenological approach was then taken based upon the writings of Gordon Cullen. He writes about three ways to analyze an area to help create interesting and successful developments. This drawing shows the waterfront user's position in the environment. More specifically, a person feels like they are outside of a space (purple), entering or exiting a space (pink), or inside a space (blue) along the waterfront. This analysis helped to identify possible sites and site borders by thinking of sites designated with the light blue color as potential development sites. The question of how to connect the purple sites to the blue sites was also raised.

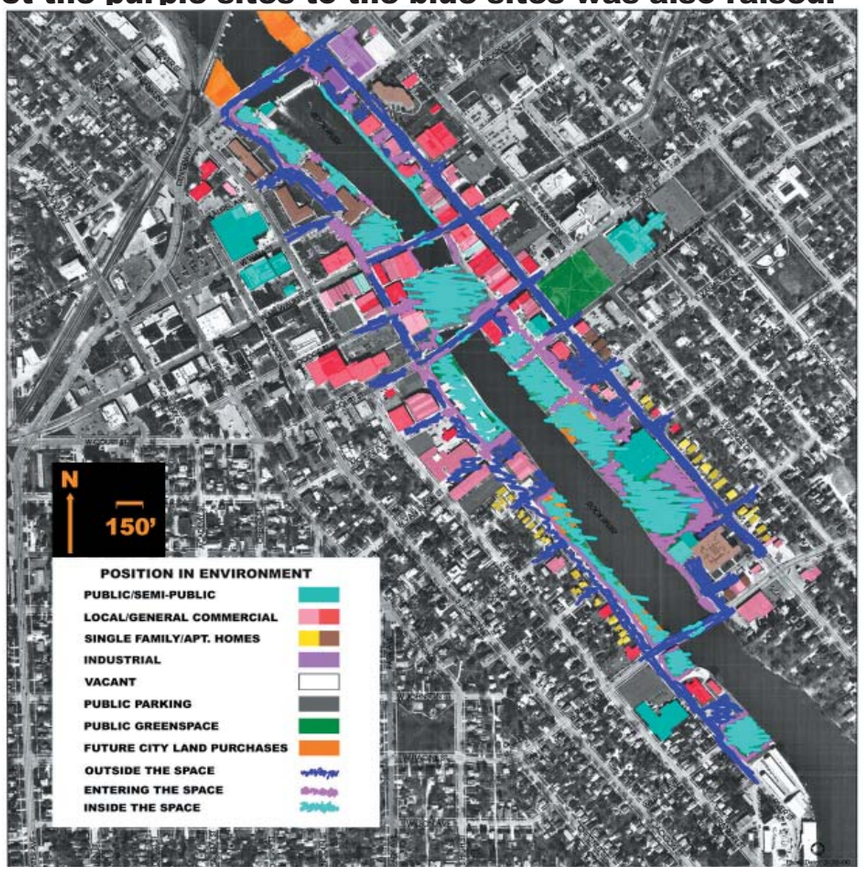

Figure 7.6. Position in the environment.

This drawing shows the contextual analysis that was conducted along the downtown waterfront. This drawing details the materials used, the architecture, and the uses of the downtown area. This will help inform the design about those same aspects. For example, the yellow color denotes small wood single-family residential homes. The gold color shows where institutional buildings are and that they are large, brick or stone buildings. The light purple shows the industrial part of the river was to the north. The green denotes the small wooden rows of shops. These identifications are necessary because they show what materials, uses, or scales should be used in certain areas to conform with existing conditions.

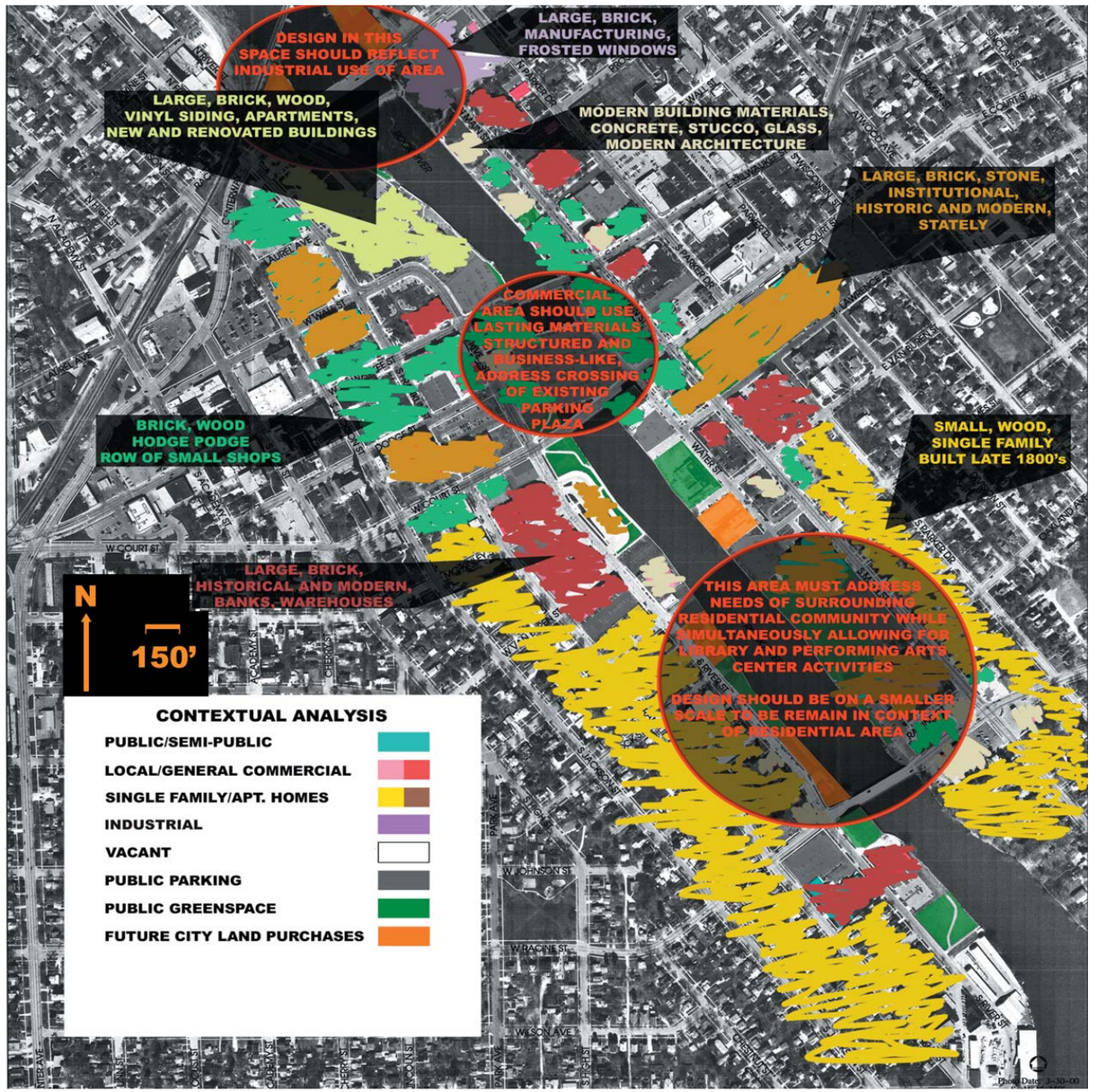

Figure 7.7. Contextual analysis.

Cullen writes that our experiences consist of a sequence of views or "serial vision." As one travels through a space and passes by different visual stops, new information is acquired in jumps. A sequence of many visual jumps is much more pleasant than a long view because there is little change in experience with a long view. This drawing shows where choke points occur along the waterfront and Main St. The east side of the river is more interesting because of the many small openings and views to the river. The west side has long uninteresting views. This information should lead to the creation of more choke points along the west side of the river so that side is more interesting.

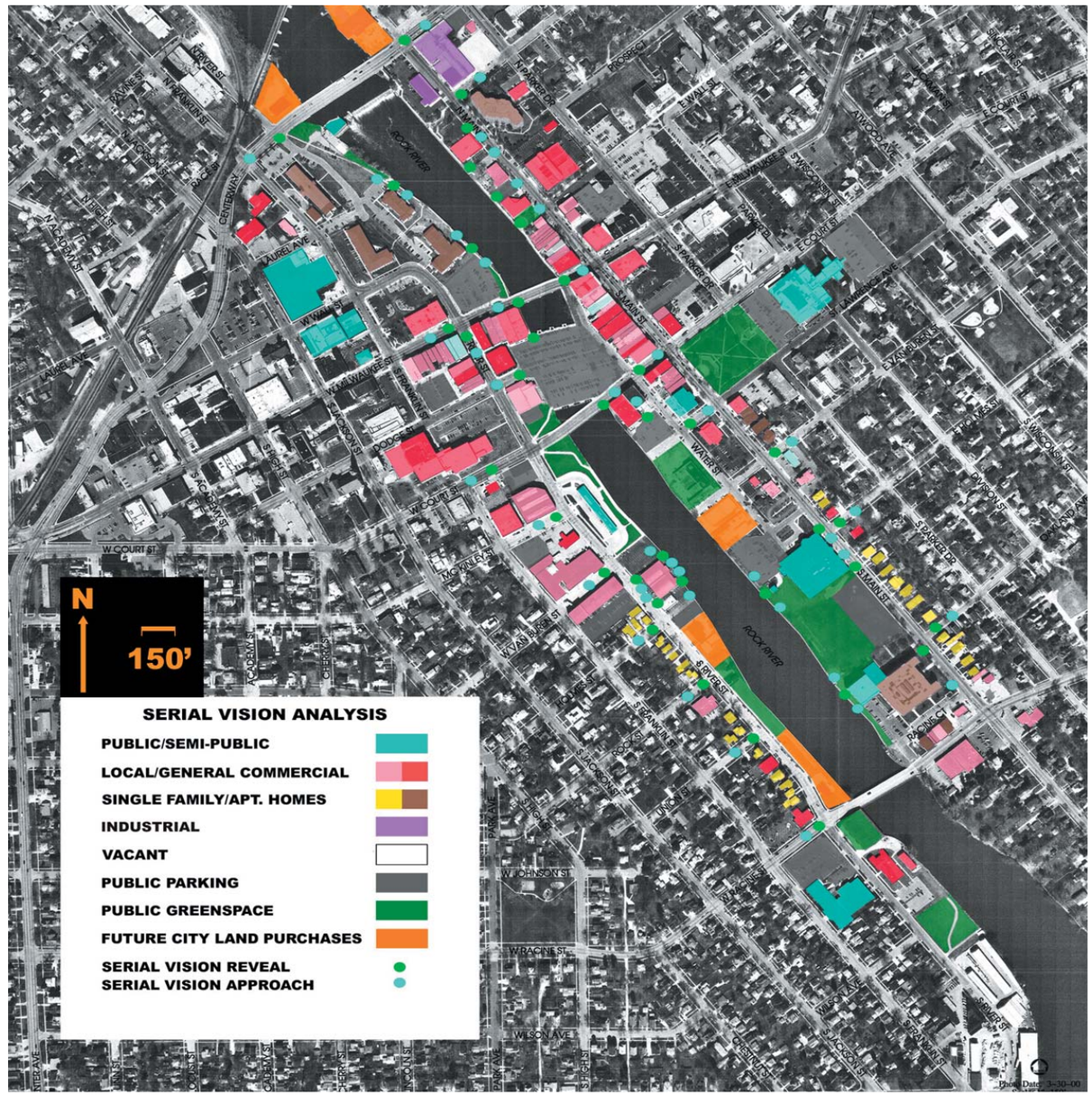

Figure 7.8. Serial vision.

An intimate waterfront will maximize physical, visual, and auditory access to the water. The next series of drawings will show the existing access at three different scales. The pedestrian scale is the river experience on the river's edge. The road scale consists of views from parallel roads (Main and River Streets). The downtown scale consists of views from outside the river corridor usually along perpendicular roads. The drawing on the left details the audible access to the waterfront and illustrates that points along the north end of the river will experience river sound while the sounds at the south side are limited. Therefor, the riverfront design should create more sound on the south end of the river. The drawing on the right shows the view from the downtown scale. The drawing shows that there are many perpendicular roads that offer views to the Rock River that could be highlighted by riverfront development to draw attention.

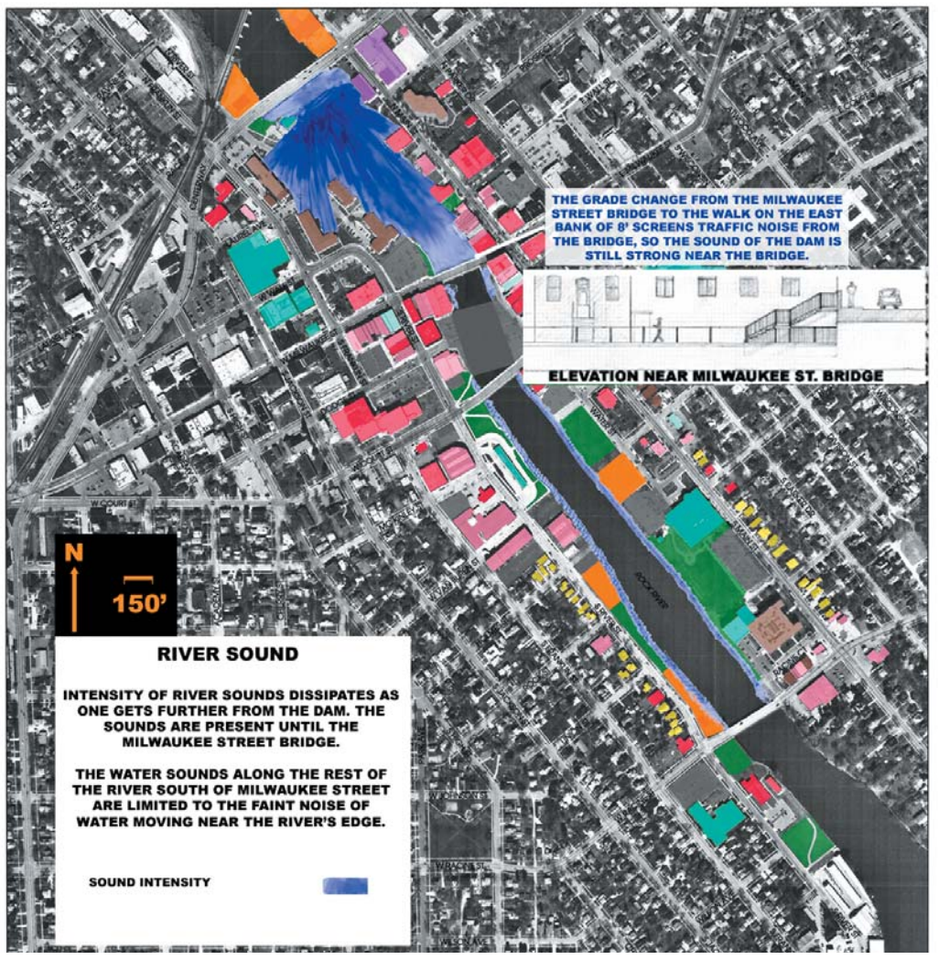

Figure 7.9. River sounds.

Figure 7.10. Downtown scale.

These drawings show the experience one has at the road scale. Viewsheds are detailed as one travels along roads parallel to the river in both directions. Special notice has been given to the intersections with stop lights because if traffic is stopped, there is more time to look around. This analysis helped to identify key views that connect to the river. These key views will be noted to create focal points along the river to bring people to the river's edge.

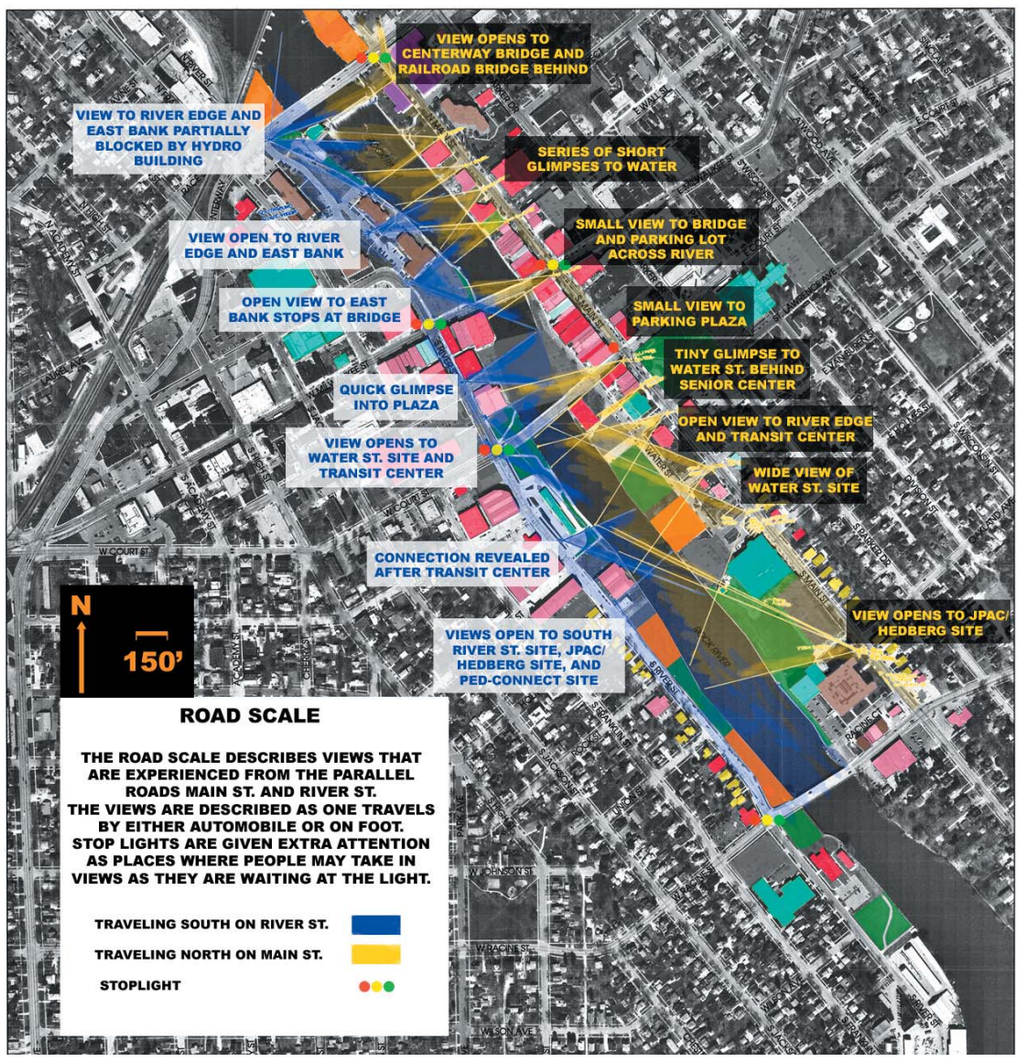

Figure 7.11. Road scale - 1.

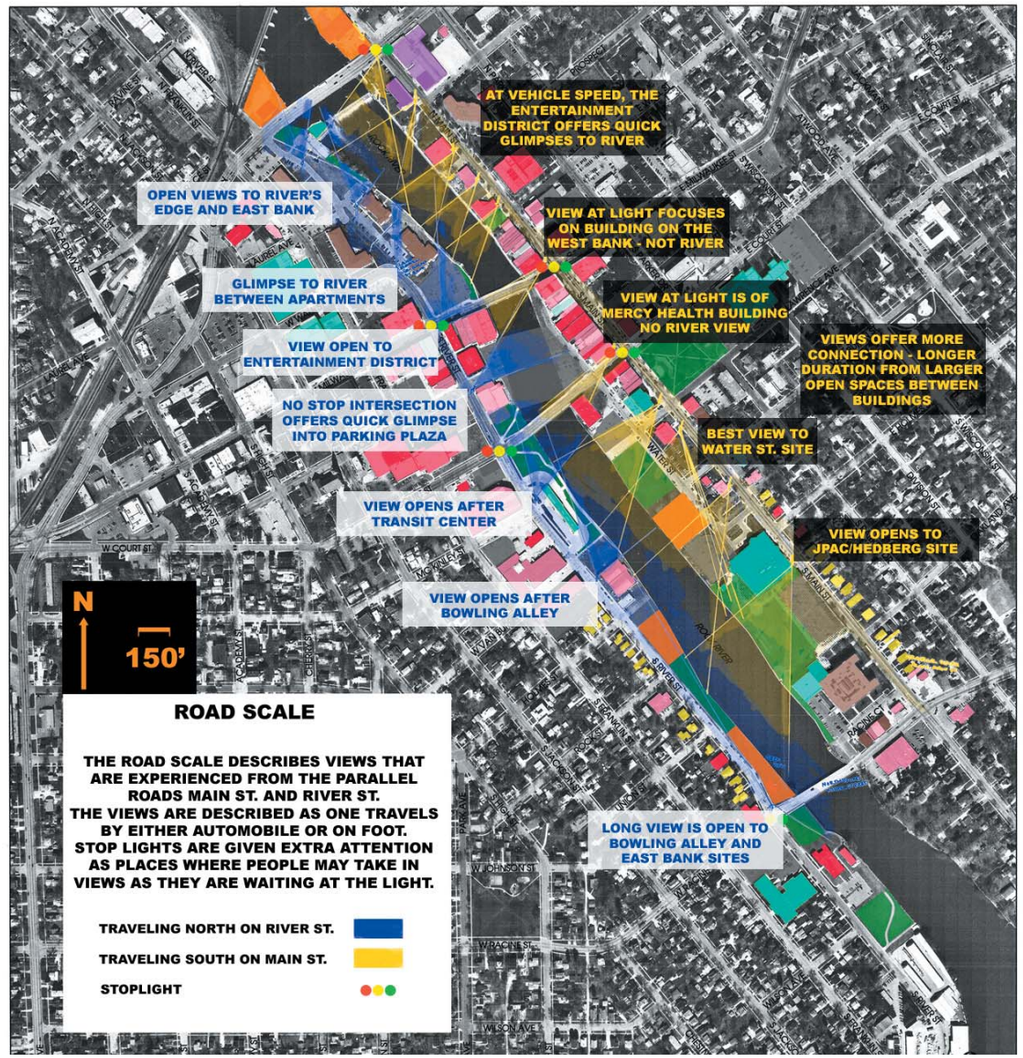

Figure 7.12. Road scale - 2.

These two drawings show the viewsheds that are experienced while traveling on foot along the river's edge. These drawings also describe the views in both directions. There are some sketches to help explanations. These drawings helped to direct decisions about where focal points and design decisions would be made. One observation was that some riverfront buildings were too close to the bank, making the walk uncomfortable. This could be remedied by adding land to that side of the bank to make the space more comfortable.

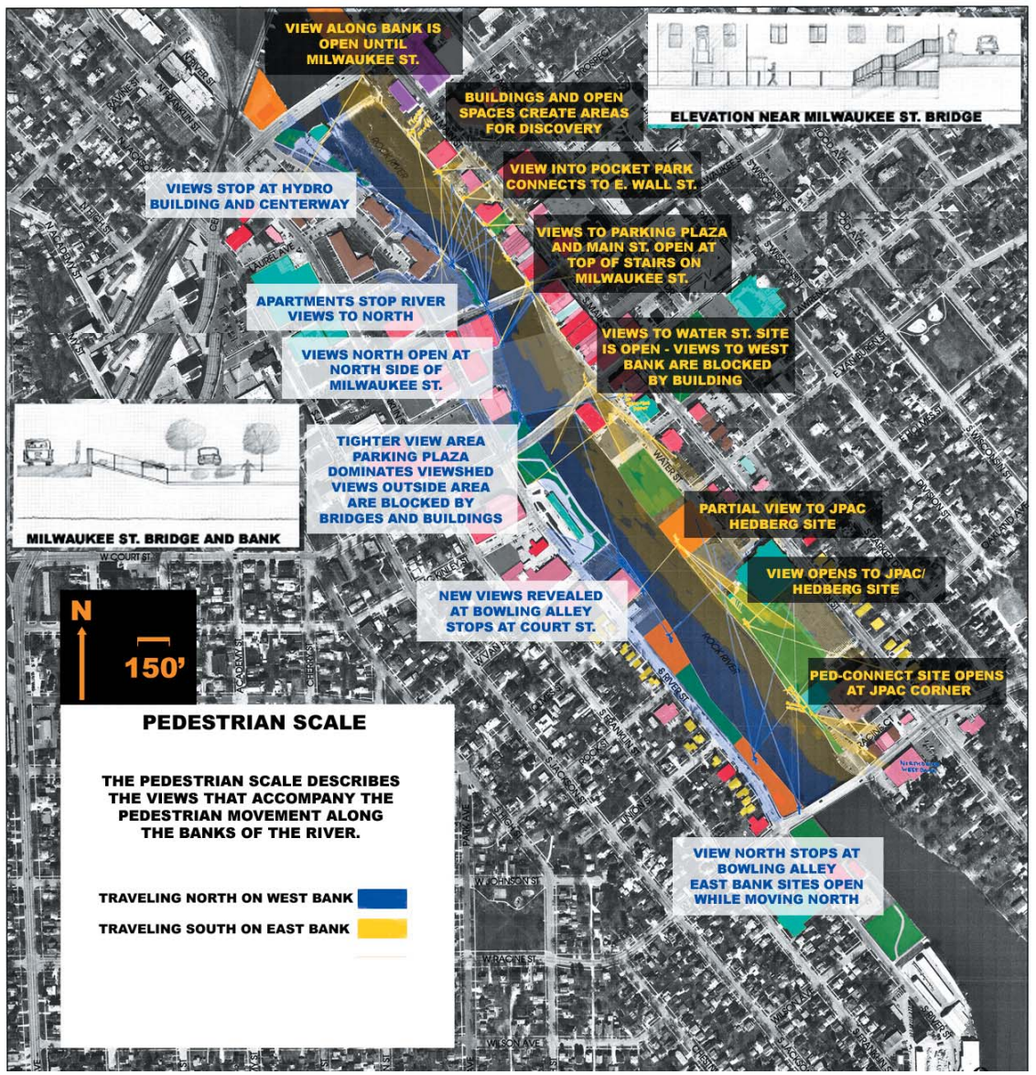

Figure 7.13. Pedestrian scale - 1.

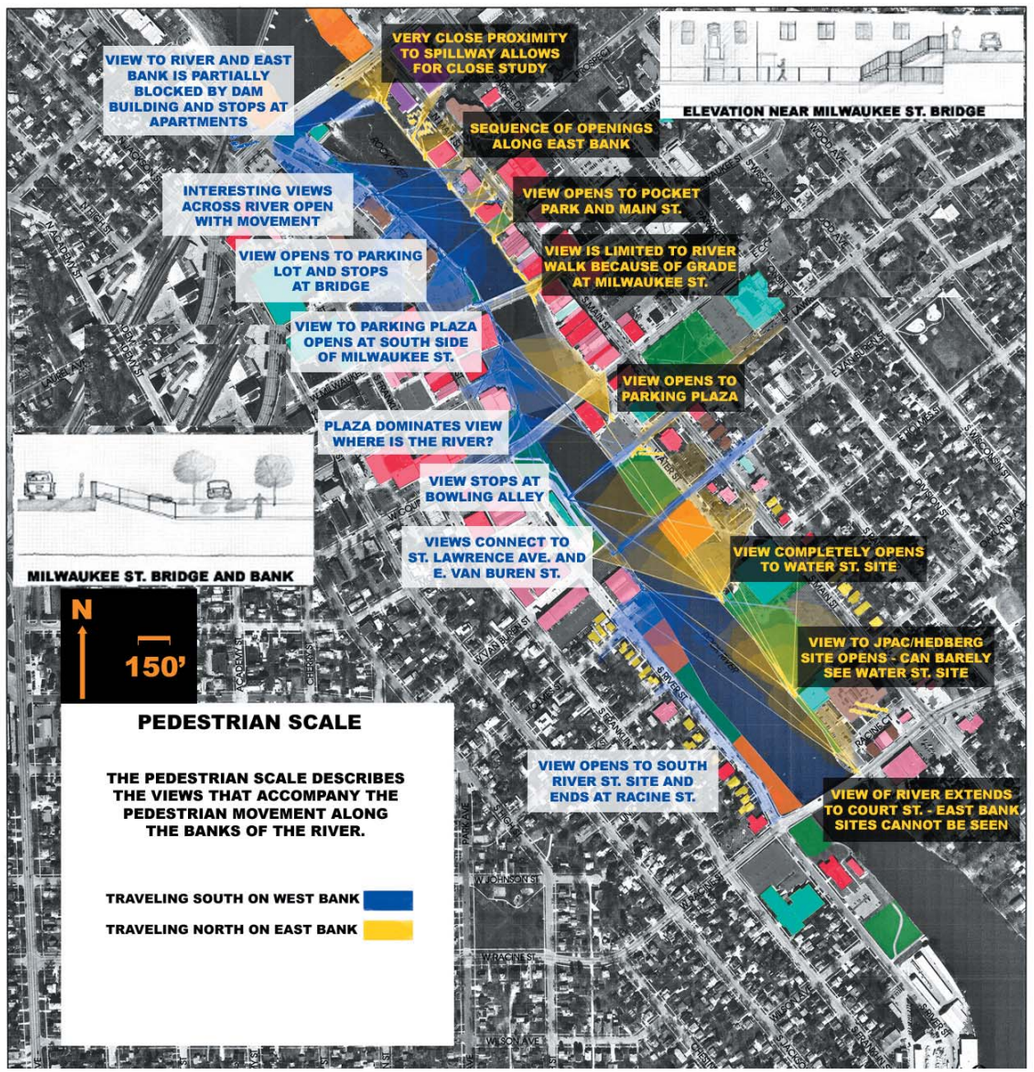

Figure 7.14. Pedestrian scale - 2.

Measurements and photos were taken along the waterfront to determine the edge conditions at different locations. Scale drawings were then created to show the existing conditions along the waterfront. In most places, the river is lined with a 6 to 15 foot flood wall. This flood wall severely limits intimate access.

The design should limit the vertical drops along the waterfront and make the river physically accessible. This could be done by terracing, stepping, or sloping the riverbank. The most important aspect of the riverfront should be that the users are able to touch the water. These elevations show that some of the areas with lower walls would be better suited to step down to the river, and the areas with higher walls may be better suited for another treatment because the steps would need too much horizontal distance to change heights.

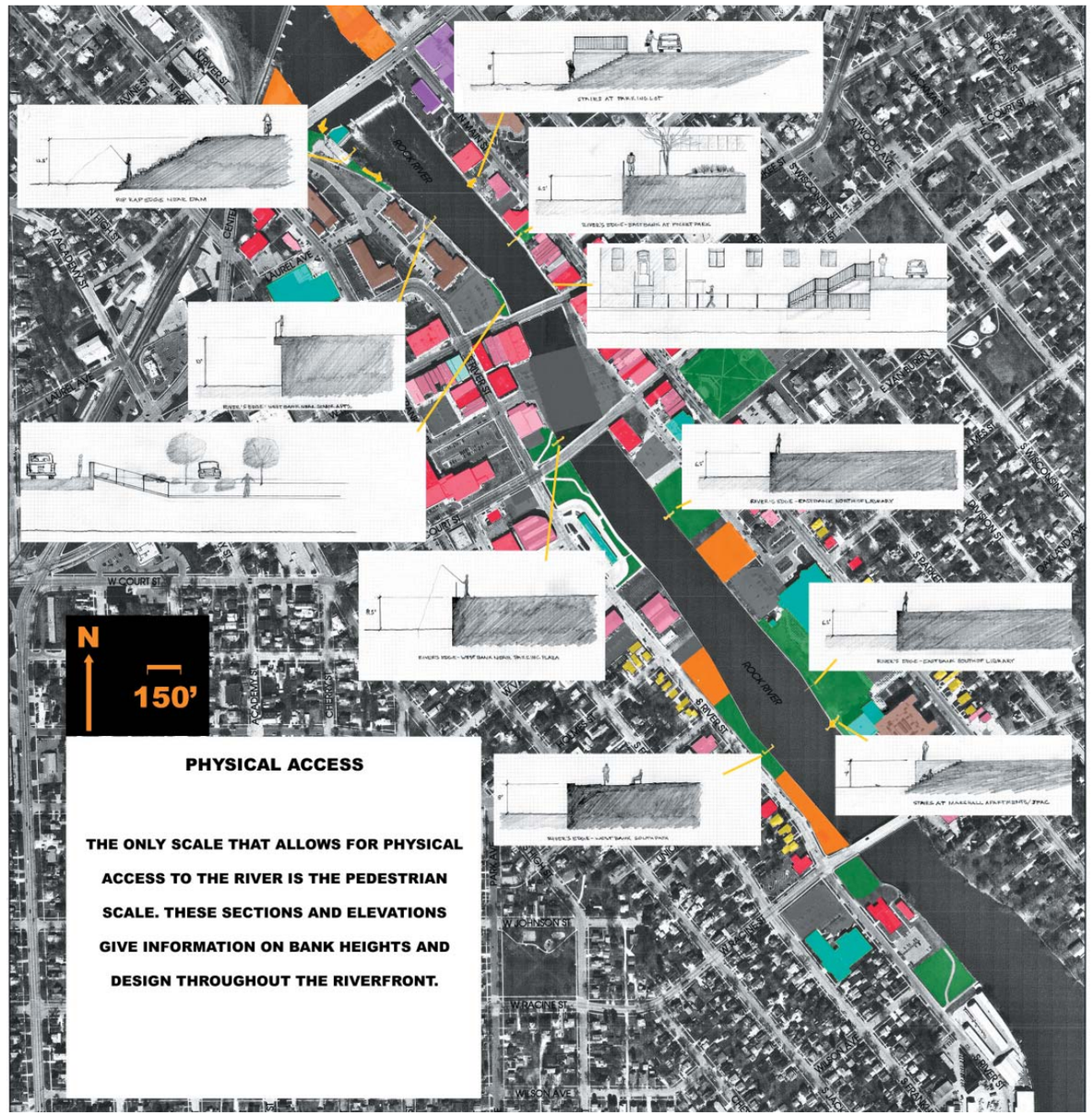

Figure 7.15. Rock River edge conditions.

The last step in the analysis phase is the drafting of the synthesis drawing. This synthesis drawing explains the potentials for the riverfront of Janesville by splitting up the river corridor into nine potential redevelopment sites. The color of the text corresponds with the respective colored area on the map. The symbols that are placed in the map correspond to potentials for vertical focal points, riverfront identifiers, transportation nodes, areas of future riverbank extension and potential underground passage to link the pedestrian waterfront.

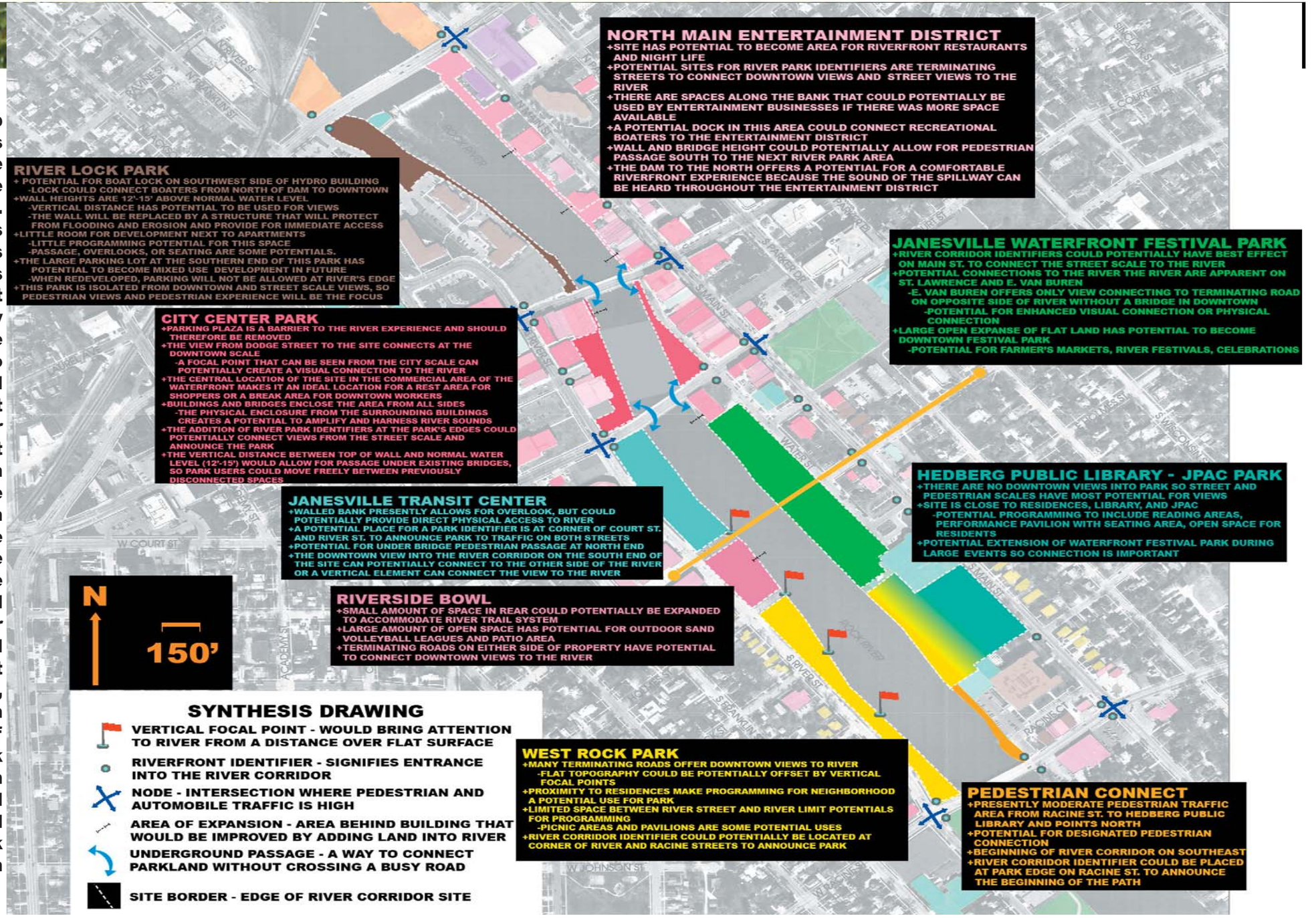

Figure 7.16. Synthesis drawing.

CHAPTER 8: RIVER DESIGN

Figure 8.1. Braided river.

Concept

The concept for the downtown river corridor is inspired by a braided river. The water of the braided river effortlessly moves from channel to channel. The people in a waterfront corridor should be able to move to and from the water's edge just as effortlessly.

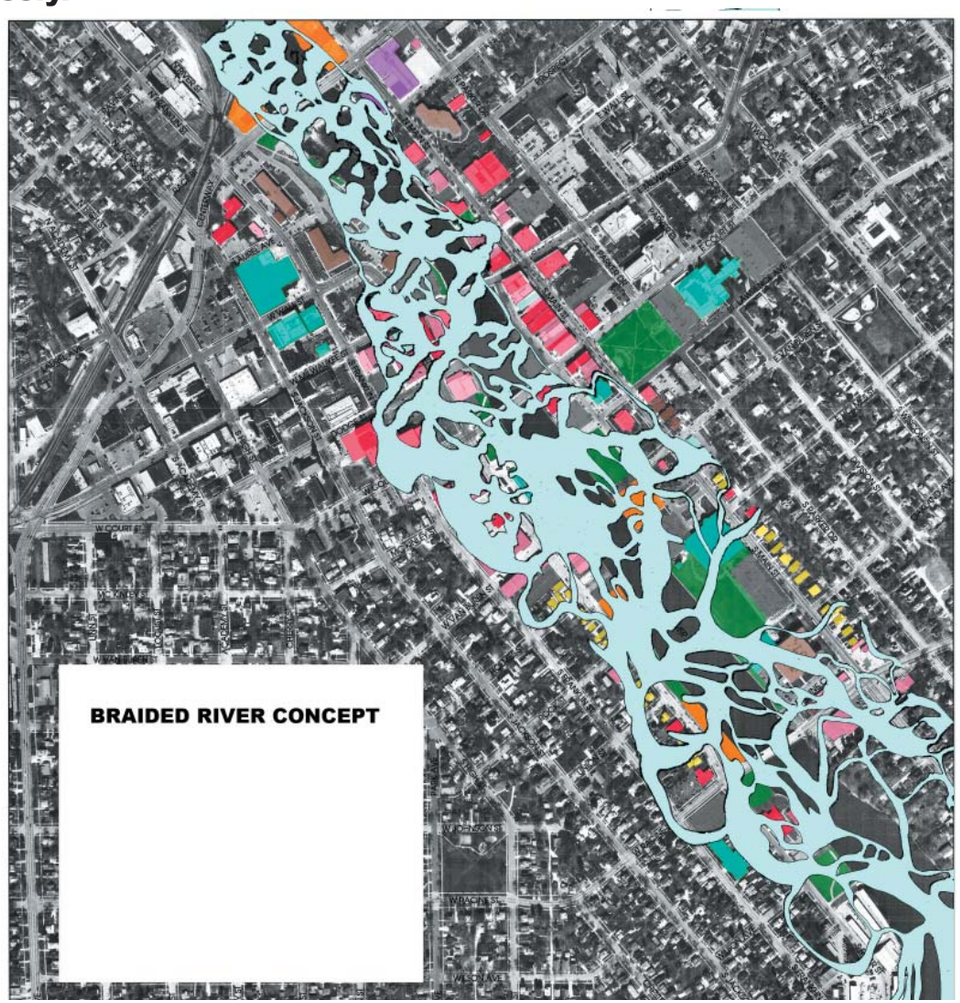

Figure 8.2. Braided river overlay.

This closeup view of the braided river concept shows different "braids," or circulation paths, emptying into the river. Some paths connect from the downtown scale, some connect at the road scale, and some connect at the pedestrian scale. A person on the waterfront could be compared to a leaf floating in a braided river. They could start at the same position many times, and never follow the same path twice. The braided river concept connects all of the waterfront scales to the riverfront and to each other. The views from the downtown and road scales will bring attention to the river. When a person follows those views to the river, they are brought into the river corridor where they can explore the many different experiences of the river

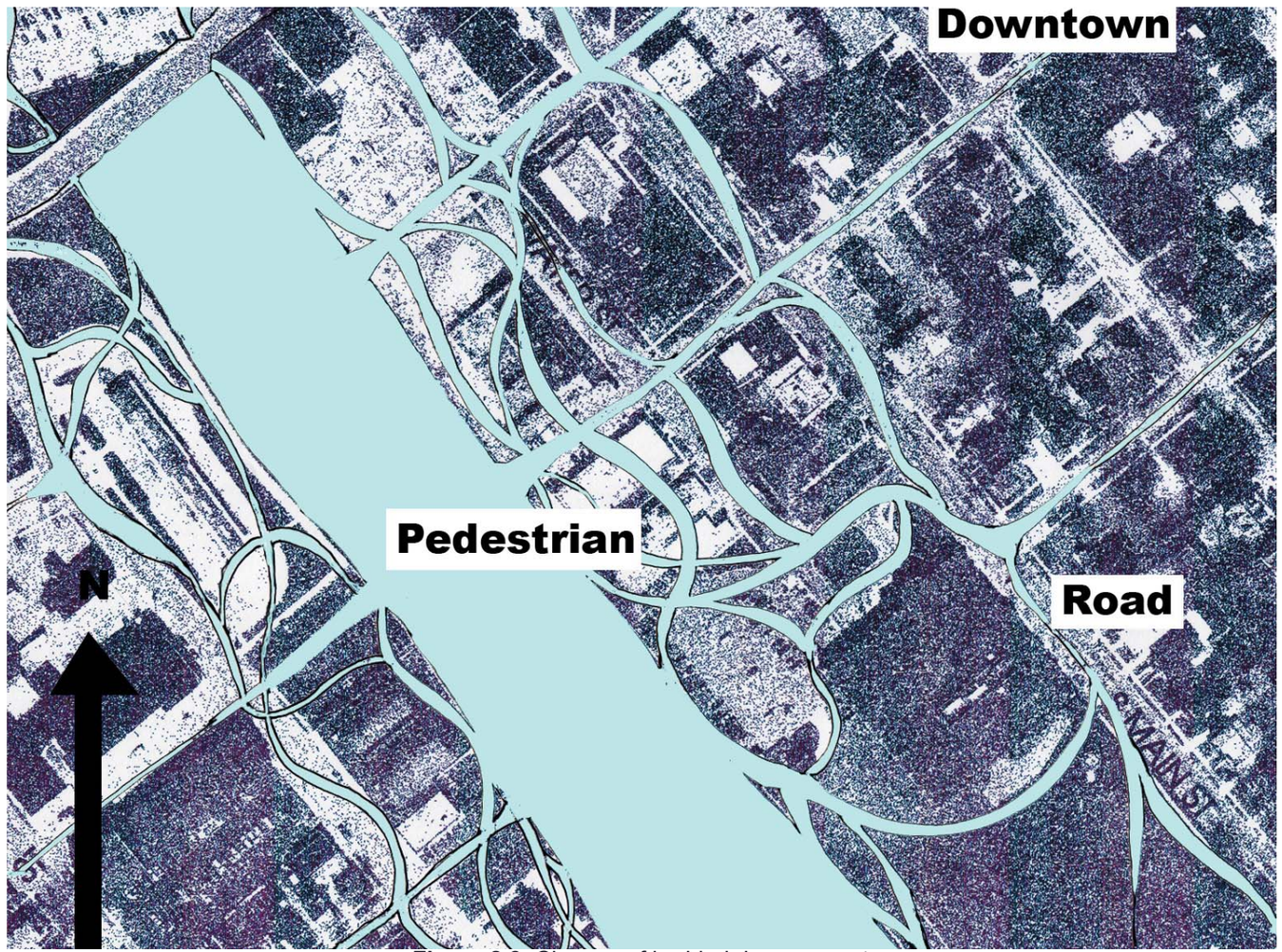

Figure 8.3. Closeup of braided river concept.

Concept to Form

As the number one concern for the riverfront design, physical access to the river is crucial. The braided river concept creates opportunities to break down the existing flood walls by creating ramps, terraces, and stairs that work like the many braids of a river allowing people to move to the water and back to land easily and safely. The lines on the left show how a braided river would look in plan view. The middle drawing shows the braids separated and extruded to show the beginnings of new levels. The drawing on the right shows how the form of the braided river could be further extruded to create a series of terraced levels that could be used for seating, walking, biking, roller blading, etc.

Figure 8.4. Braided river in plan view.

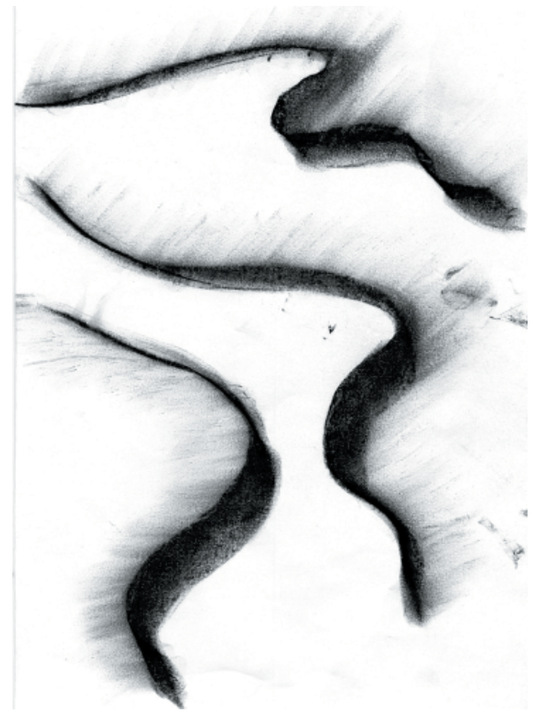

Figure 8.5. Braids separated.

Figure 8.6. Braids extruded to form terracing.

The drawings below show some of the different ways that the river's edge, the closest path to the water, can be redesigned to allow for more physical contact. Physical access to the water, flood protection, and a pathway are all present in each of these proposed sections. These are examples of possible river edge treatments, not design solutions.

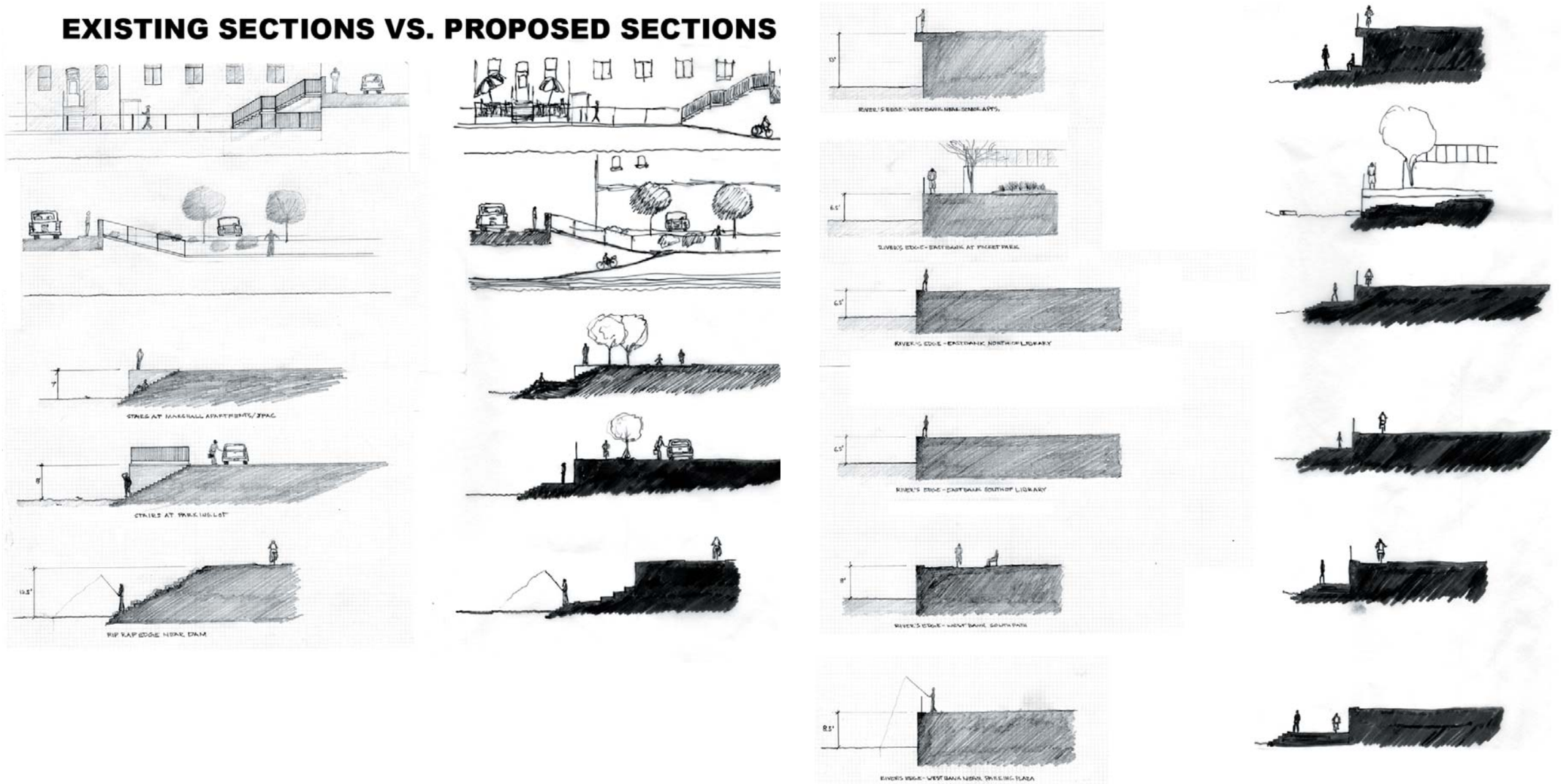

Figure 8.7. Existing sections compared to proposed sections.

River Form

The river's edge has been given a more natural look with the curved lines of a braided river. Land has been added in a convex curve at places where the river walk was too cramped. The curves are similar on both sides of the river. There is room to walk next to the river on the lowest terrace. The lower level also allows people to cross beneath bridges, so they do not have to cross busy streets. The drawing below shows that the parking plaza has been removed. If the river is going to be a destination, it cannot be hidden from sight.

Figure 8.8. The plan view of the river shows the new curvilinear bank.

Figure 8.9. This closer view of the old parking plaza site shows the development of ramps and under-bridge pathways that connect to the river.

A goal of this project from the beginning was to draft a master plan for the riverfront, but the overplanning of the area does not take into account the constant changes that happen in an urban area. There are two sites that have the most potential for bringing life back to the Rock River. On the left, the Hedberg Public Library/Janesville Performing Arts Center site is the first to be schematically designed in the southern area of the downtown waterfront. The mix of residential properties and public amenities adjacent to the site make it a potential catalyst for development. On the north end of the river (right) a lock on the west side of the dam will allow recreational boaters to enter the downtown area. As a response, a dock and park design has been fully developed near the entertainment district, so boaters can access the restaurants and shopping of downtown Janesville.

Figure 8.10. The Library/JPAC site will offer riverside seating, a large green, a small amount of parking, and a performance pavilion.

Figure 8.11. The Entertainment District Dock will be alive with activity,

CHAPTER 9: SITE DESIGN

Concept

The concept of the small park in the entertainment district is derived from the geological process of forming an oxbow lake. An oxbow lake is formed when a meander of a river or stream erodes away the portion of land that creates the meander. The new stream channel then deposits sediment into the old meander until the meander is completely closed off. The leftover meander is the oxbow lake. The oxbow lake could definitely be an offshoot from a braided river.

The bike path itself looks like a meander, and the fountain in the middle of the park can be thought of as a small oxbow. As people flow through the park, some may stop to sit or exit the trail for Main Street just like sediment drops out of the river at a meander.

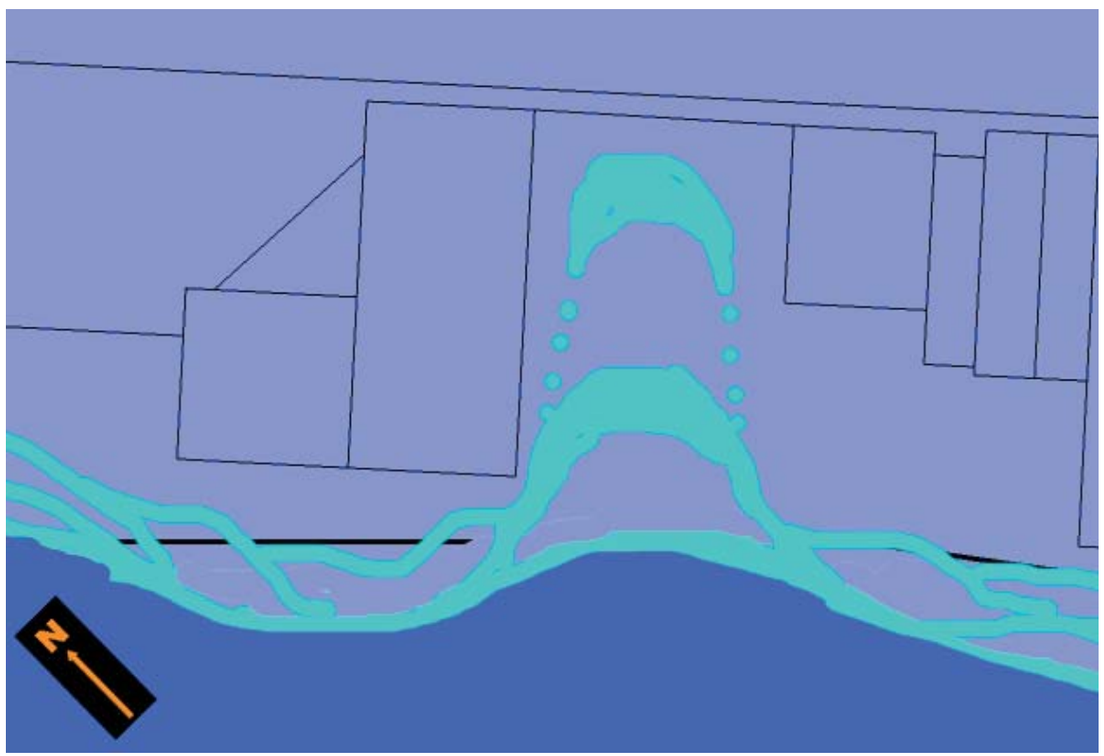

Figure 9.1. The oxbow lake concept drawing.

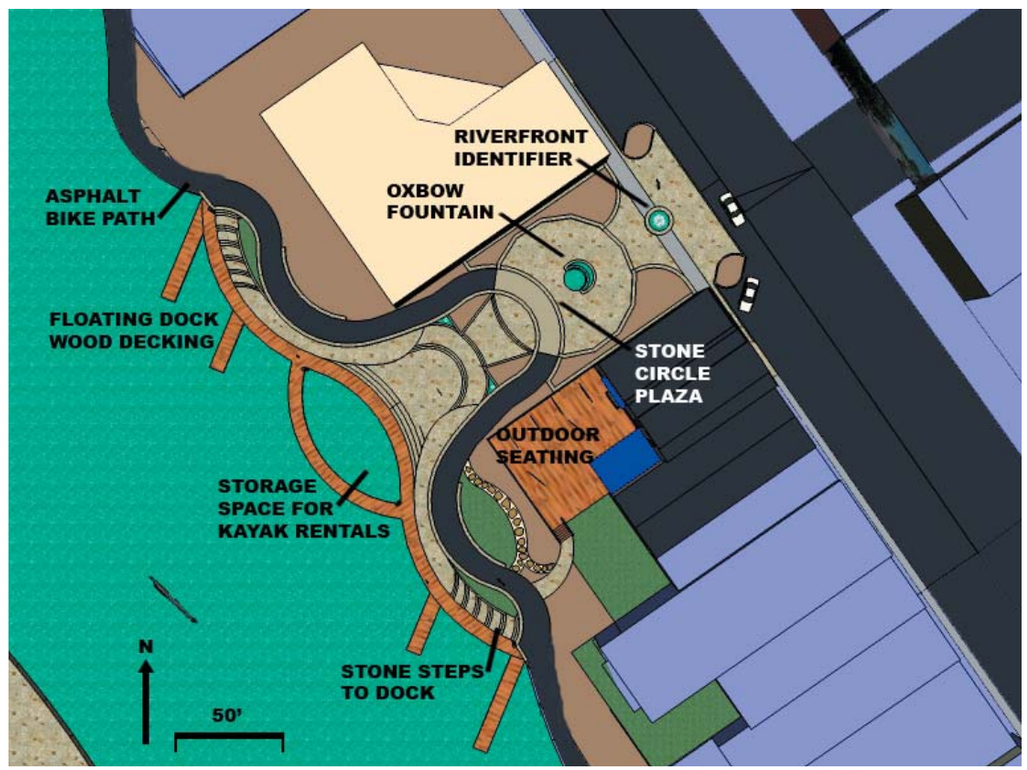

Figure 9.2. Pathways are similar to the oxbow lake concept drawing.

Design

This design offers a host of opportunities for and intimate experience. There are many seating areas along the river and in the circular plaza for people to stop and observe the river at the pedestrian scale. The entrance contains a fountain which acts as a river corridor identifier, announcing the park to Main Street. The angle to the river has been lowered, so passersby can see the river from the road scale. The view from the terminating road is open to the river also, so the downtown scale is connected. The stairs on the bank next to the dock make moving from dock to land easy when water levels are above normal. The contained water area in the middle can be used to store rental boats. The deck behind the building on the south side of the park, although not part of the design, gives property owners an idea for how to develop the riverside portion of their property.

Materials

The new walls will be built with large locally quarried flagstone. Much of the circular plaza, stairways, entrance, and other pavement will be constructed using the same stone. The bike path will be made of asphalt for a smooth surface that is inexpensive to maintain. The dock will be covered with wood while the underside will be made of aluminum. Plant materials will be native to the area and offer year-round interest.

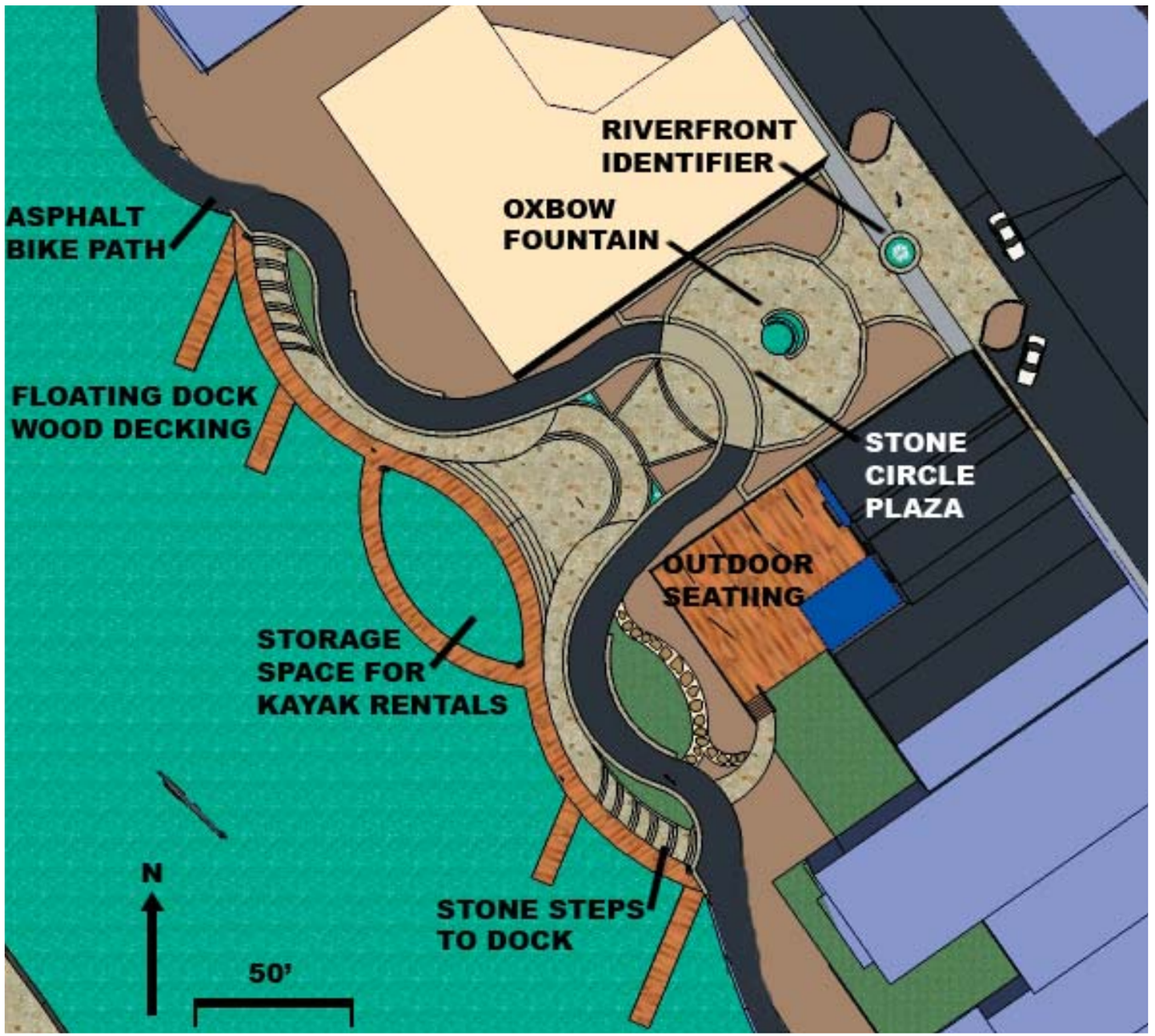

Figure 9.3. Entertainment District Dock Plan.

Vignettes

The drawing below shows the river corridor identifier in the foreground. The view is open to the river behind. This view is an example of the "Downtown Scale" connection and is taken from the end of the perpendicular road to the northeast.

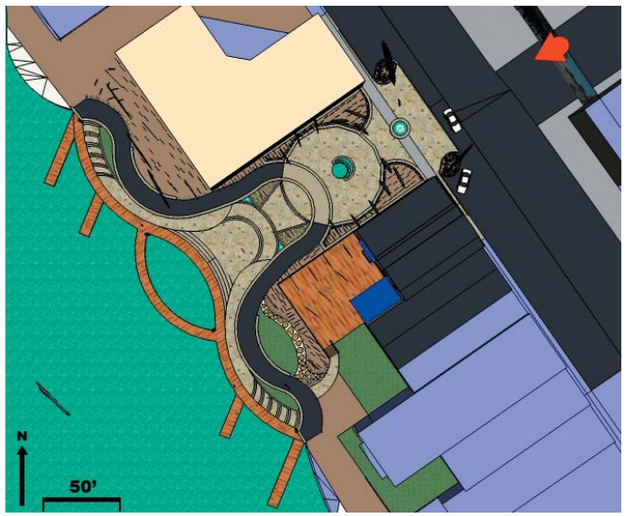

Figure 9.4. Plan view from E. Wall ST.

Figure 9.5. View from E. Wall ST.

This view is taken from the river back into the city, reinforcing the "Downtown Scale" connection. The pole in the foreground allows the dock to move vertically with the river level.

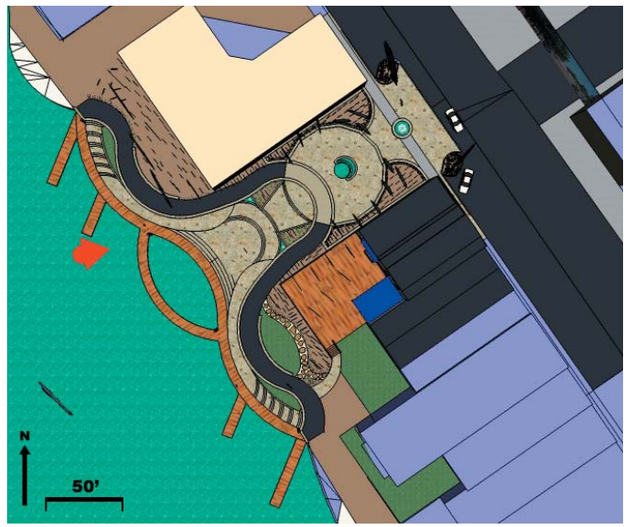

Figure 9.6. Plan view from the Rock River

Figure 9.7. View from the Rock River looking towards E. Wall St.

This drawing shows river corridor identifier in the middle of the sidewalk which forces pedestrians to make a decision to enter the park or walk around. The placement of the identifier in a common area and not inside the park will pique the curiosity of entertainment district users.

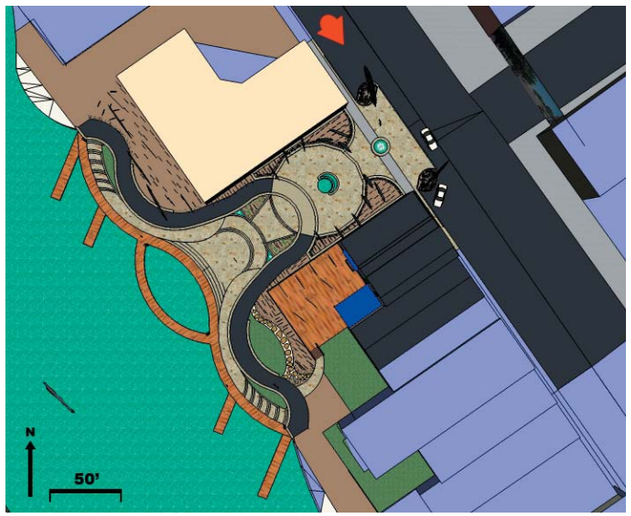

Figure 9.8. Plan view looking south on N. Main St.

Figure 9.9. View looking south on N. Main St.

This drawing gives a detailed look at the stairs that connect the floating dock to the rest of the waterfront. There are also seat walls on the front and back side of the asphalt path. Plant material between the deck and the river is kept low so views will not be disrupted.

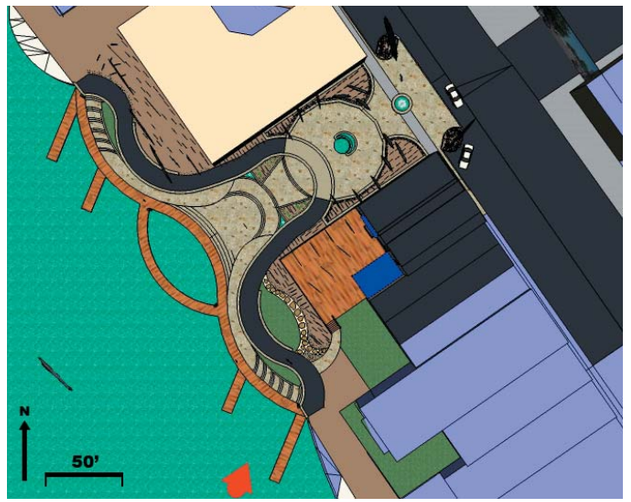

Figure 9.10. Plan view from Milwaukee St. bridge.

Figure 9.11. View from Milwaukee St. bridge looking north.

This view is a close-up of the design looking east. The sound of running water will be apparent whether from one of the four fountains in the park or from the sound of the dam spillway. Low plantings in the middle beds do not block views while taller denser plantings line the walls in the circular plaza.

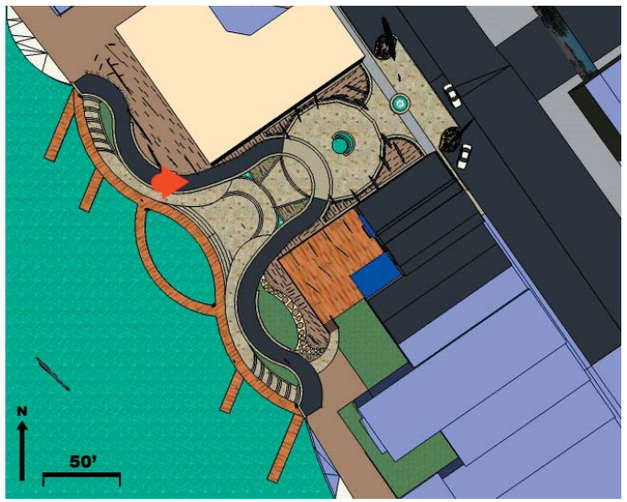

Figure 9.12. Plan view from bike path.

This drawing is a view west to the river and the apartments beyond. The oxbow fountain in the foreground will fill the circular plaza with soothing sounds of falling water. There are three choices from this point: left, right, or to the river.

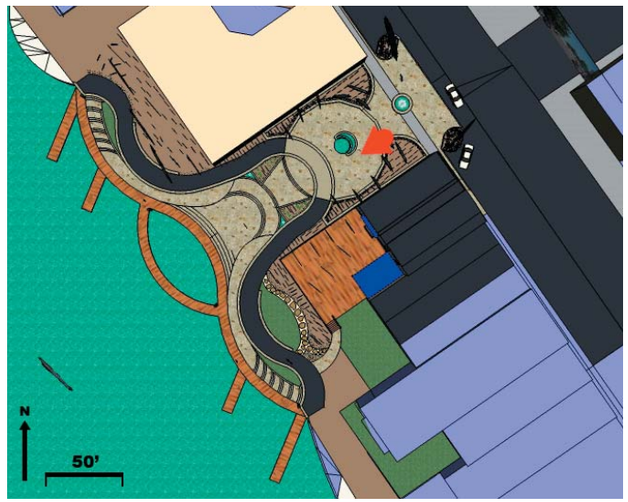

Figure 9.14. Plan view back of fountain looking west.

Figure 9.13. View from bike path looking towards E. Wall St.

Figure 9.15. View back of fountain looking west across the Rock River.

Compare what is presently existing at the Entertainment District Dock site to the current design.

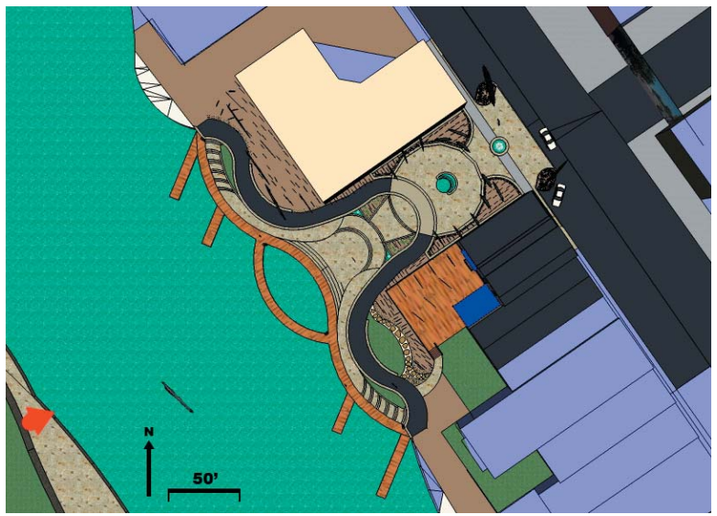

Figure 9.16. Plan view from west side of river.

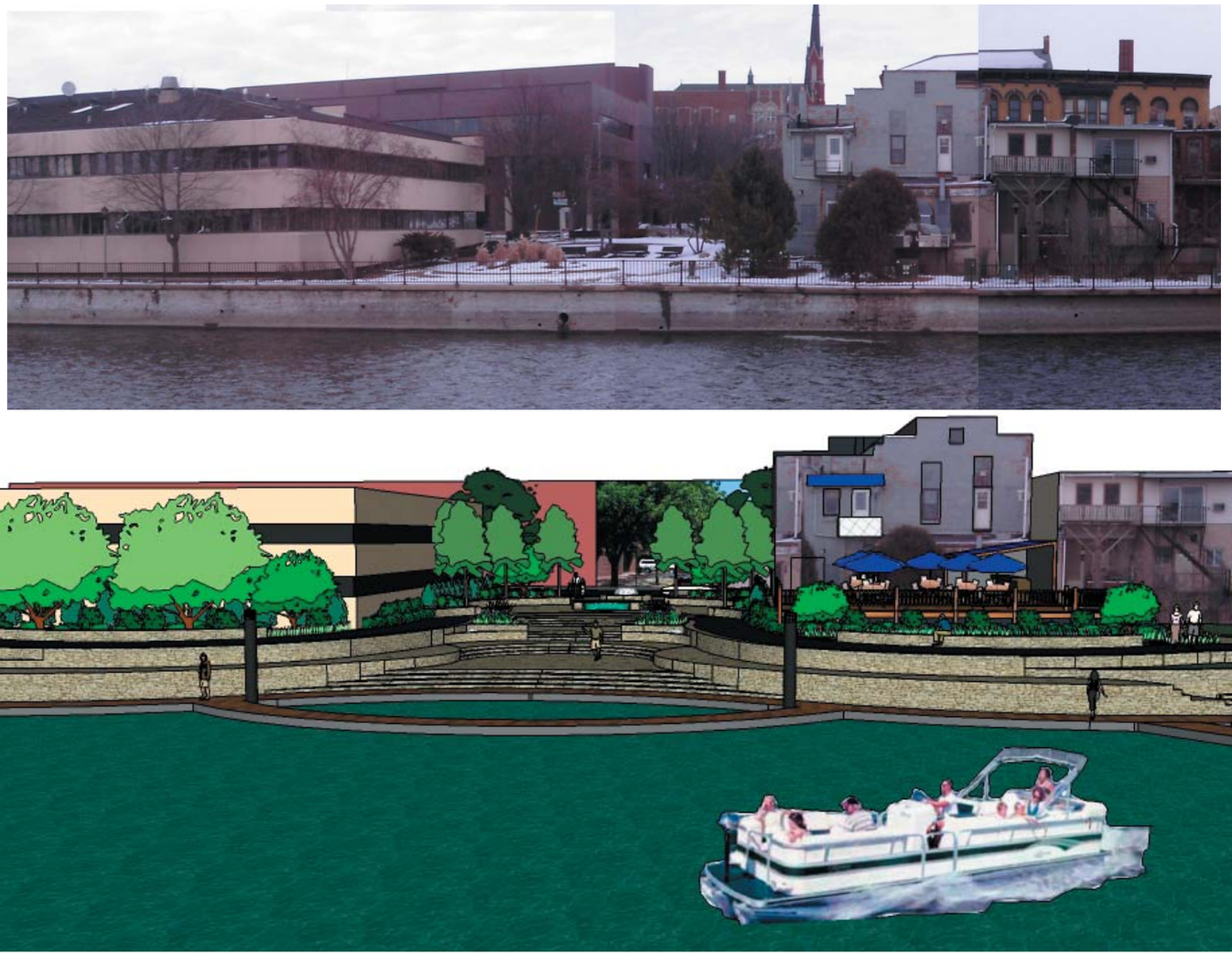

Figure 9.17. Existing vs. proposed.

CHAPTER 10: REFLECTION

Every time I think of this project and what I am trying to accomplish in designing the intimate waterfront, I think about the two pictures below. These two sets of steps make up half of the places that people can touch the water in downtown Janesville. I don't think there was ever a time when I walked by either of these two sets of stairs and failed walk down to look at the water. These stairways create a feeling of intimacy because when you are there, nothing else exists. That personal intimacy is one feeling I tried to create in the design of the Entertainment District Dock while also trying to maximize intimacy at other scales too. I believe I was successful at doing just that.

Figure 10.1. Private staircase.

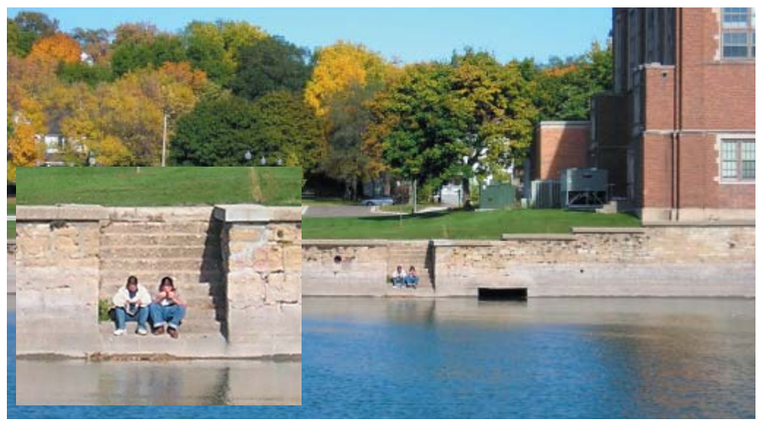

Figure 10.2. Marshall staircase.

I have done more analysis for this project than I have done for every other project that I have worked on combined, and although I found it a bit tedious at times, I am glad I stayed with it. When I set out to research this thesis, I wanted to draft design guidelines that would help others create intimate waterfronts, and I wanted to use those guidelines to draft a master plan for the entire downtown waterfront of Janesville, Wisconsin. The design guidelines that I formulated for my position paper were not extensive or specific enough to be very helpful, so I learned a lot about what would be in those guidelines by working through the design. I still believe that poorly sited buildings, flood control measures, and transportation infrastructure limit intimacy, but the guidelines should also take into account the downtown scale, the road scale, and the pedestrian scale. Designing with the three scales in mind will help the downtown area, as a whole, foster an intimate relationship with the water. As for designing both sides of the mile long section of the Rock River, I can now say that master planning the entire site is not the key to the success of the waterfront. The amount of resources that would be necessary for the construction of the entire downtown waterfront would ensure that years would pass before it would be completed. Also, I believe that if the Entertainment District Dock and Hedberg/JPAC sites were constructed, the popularity of those two parks would spark more community involvement in the design of the rest of the waterfront which would in turn give citizens a sense of ownership.

While designing this intimate waterfront, I came up with some new design guidelines that not only address the barriers of poorly sited buildings, flood control structures, and transportation infrastructure, but also consider the downtown, road, and pedestrian scales. I will conclude this book with a chapter of design guidelines that I believe will help designers to successfully create an intimate waterfront anywhere.

CHAPTER 11: DESIGN GUIDELINES REVISITED

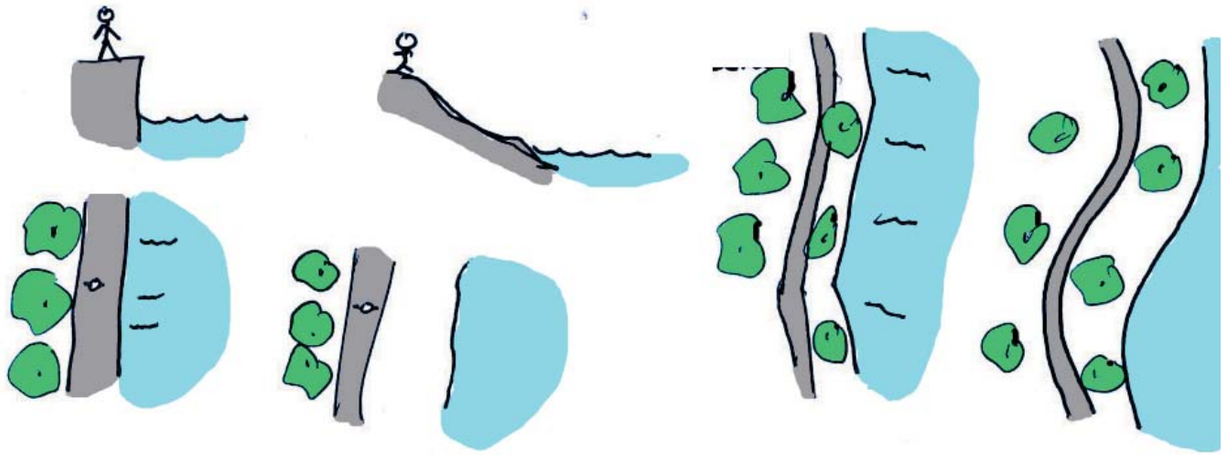

Figure 11.1. Curvilinear banks.

FLOOD CONTROL MEASURES

ENGINEERED BANKS SHOULD BE CURVILINEAR AND POSSESS PHYSICAL QUALITIES OF A NATURAL BANK

- **STRAIGHT HARD EDGE BANKS ARE LESS APPEALING**
- **PLANTS THAT ARE NATIVE TO THE AREA AND TO THE RIVER'S EDGE SHOULD BE USED**

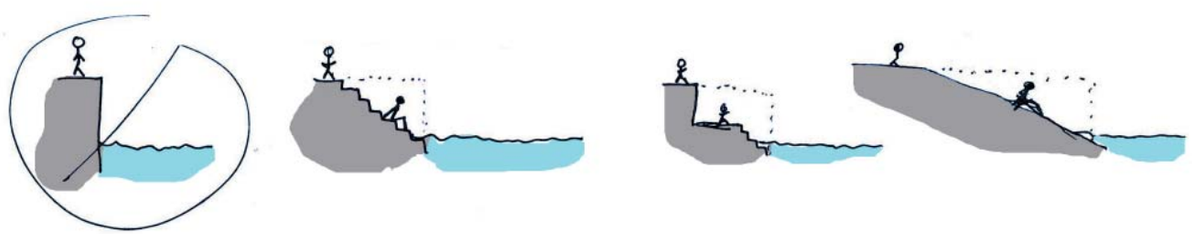

Figure 11.2. No steep slopes.

WATER'S EDGE SHOULD ALLOW FOR PHYSICAL ACCESS TO THE WATER BY ELIMINATING STEEP SLOPES OR VERTICAL EDGES

- **FLOOD CONTROL HEIGHTS SHOULD REMAIN IN PLACE**
- **TERRACING IS A WAY TO ALLOW ACCESS**
- **A GRADUAL SLOPE PROVIDES ACCESS AND A PLACE TO LAY BACK AND ENJOY THE RIVER**

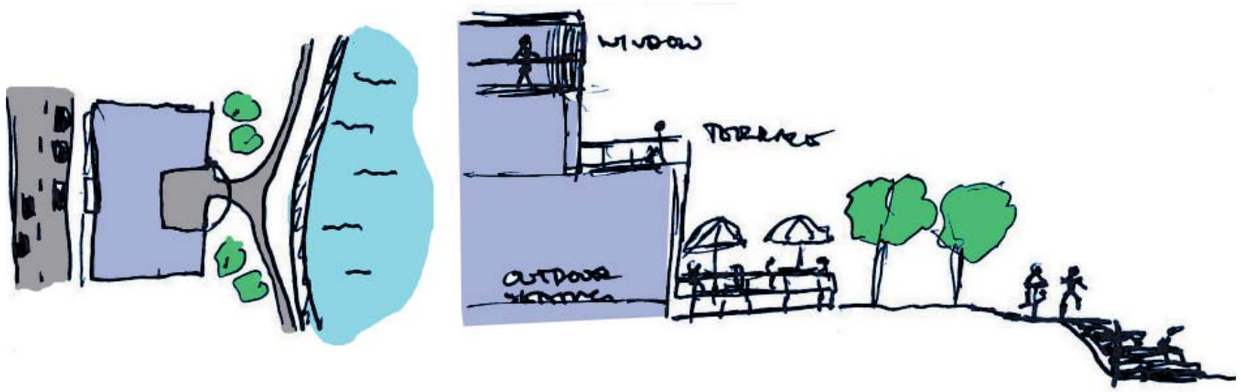

Figure 11.3. Street and water.

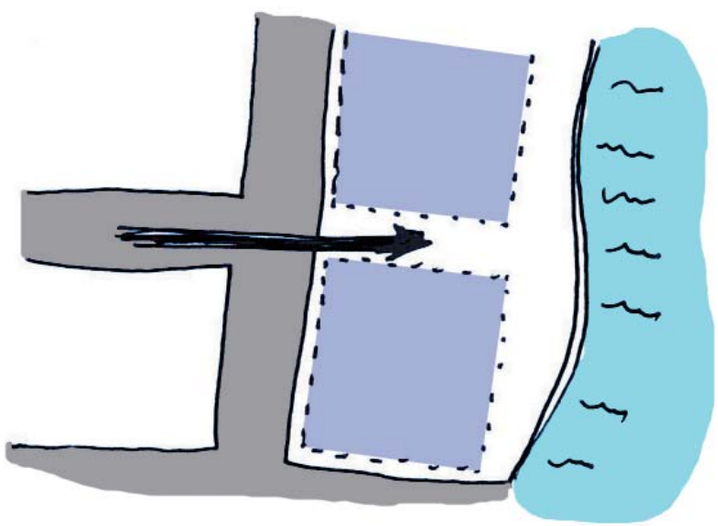

Figure 11.4. Terminating roads.

BUILDINGS

WATERFRONT BUILDINGS SHOULD ADDRESS THE STREET AS WELL AS THE WATERFRONT

- **THERE SHOULD BE ENTRANCES ON WATERFRONT AND STREET SIDES**
- **COURTYARDS/PLAZAS SHOULD BE CONSTRUCTED ON WATER SIDE AND SHOULD HAVE CONNECTIONS TO THE RIVER WALK**
- **BUILDINGS SHOULD BE DESIGNED TO TAKE ADVANTAGE OF RIVER VIEWS**
  - **ROOFTOP TERRACES**
  - **LARGE WINDOWS**
  - **OUTDOOR SEATING**

BUILDINGS SHOULD NOT BLOCK TERMINATING ROADS

- **IF A PROPERTY SPANS A TERMINATING PERPENDICULAR ROAD, NEW DEVELOPMENT MUST ALLOW THE VIEW TO REACH THE RIVER THROUGH AN OPEN AIR PASSAGE**
  - **PEDESTRIAN STREET**

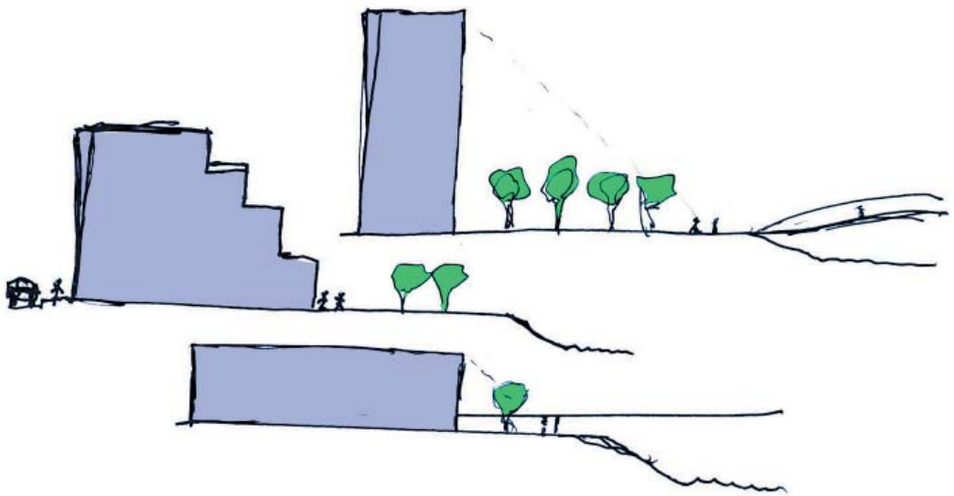

Figure 11.5. Human scale.

BUILDINGS SHOULD BE DESIGNED FOR THE HUMAN SCALE ON THE RIVERFRONT SIDE

- **BUILDINGS COULD STEP DOWN TOWARD WATER TO MIMIC NATURAL LAND BANKS**
- **TALLER BUILDINGS SHOULD BE FURTHER FROM BANKS THAN SHORTER BUILDINGS**

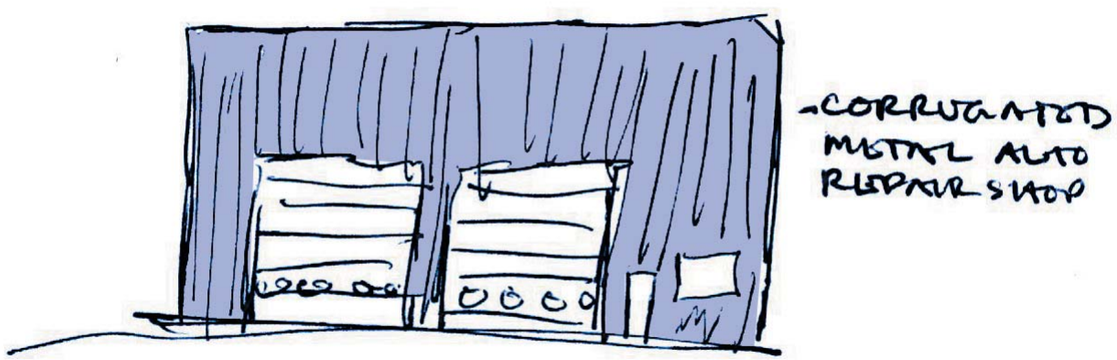

Figure 11.6. Raze or retrofit buildings.

BUILDINGS OF LITTLE HISTORIC OR ARCHITECTURAL VALUE THAT CANNOT BE RETROFITTED FOR WATERFRONT INTIMACY SHOULD BE RAZED AND REPLACED BY GREEN SPACE CONNECTIONS OR WATERFRONT BUILDINGS

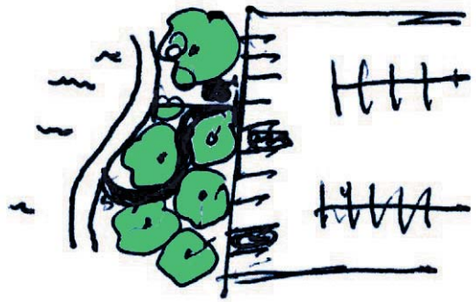

Figure 11.7. 30 foot setback.

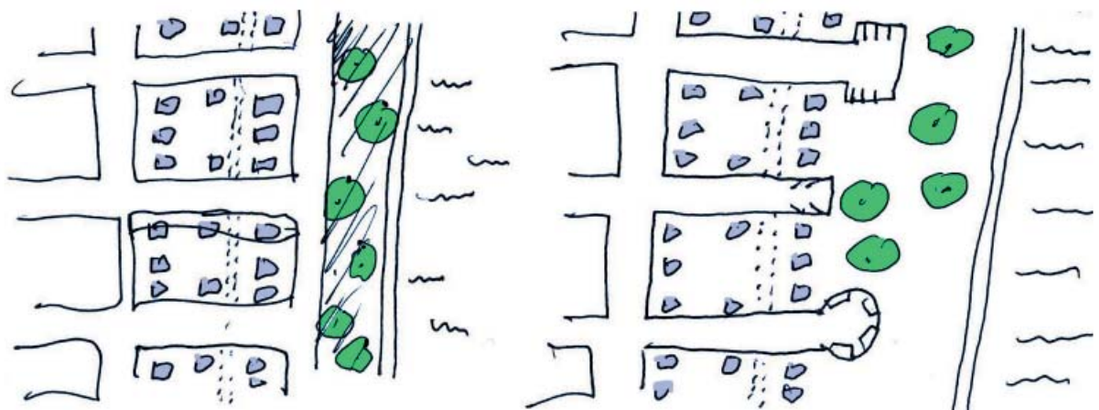

Figure 11.8. Demolished parallel roads.

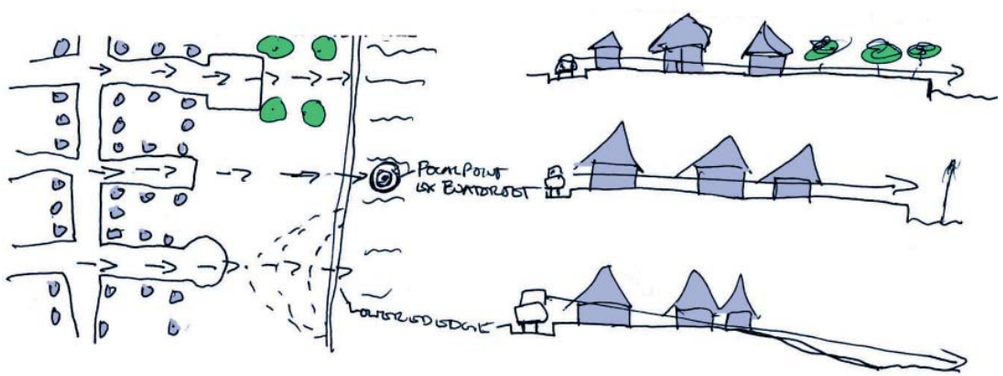

Figure 11.9. Terminating visual connections.

TRANSPORTATION INFRASTRUCTURE

PARKING LOTS SHOULD BE LOCATED AT LEAST 30 FEET FROM RIVER WALK WITH AMPLE VEGETATIVE SCREENING

- **PARKING LOTS SHOULD NOT BE SEEN FROM RIVER WALK**
- **THERE SHOULD BE A PEDESTRIAN CONNECTION TO PARKING LOTS**

WHEN POSSIBLE PARALLEL ROADS SHOULD BE DEMOLISHED TO ENHANCE PEDESTRIAN CONNECTIONS AND CREATE TERMINATING ROADS IN PARK LAND

- **THE CONSTRUCTION OF ALLEYS CONNECTING PERPENDICULAR ROADS CAN HANDLE LOCAL TRAFFIC**
- **PUBLIC PARKING FOR RIVER FRONT ACCESS COULD BE PLACED AT ROAD TERMINUS**

TERMINATING ROADS SHOULD BECOME VISUAL CONNECTIONS FROM PARALLEL STREETS

- **DO NOT BLOCK VIEWS WITH STRUCTURES OR VEGETATION**
- **CREATE FOCAL POINTS TO DRAW ATTENTION**
- **LOWER RIVER EDGE TO CREATE ANGLE**

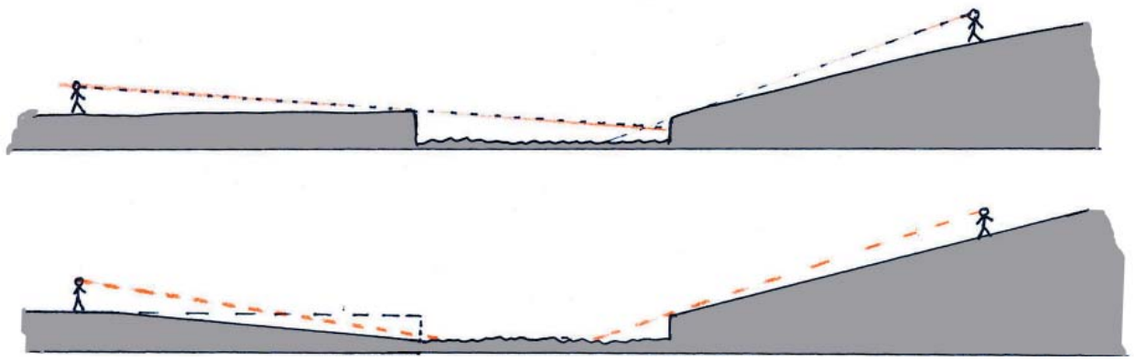

Figure 11.10. Topographical connection.

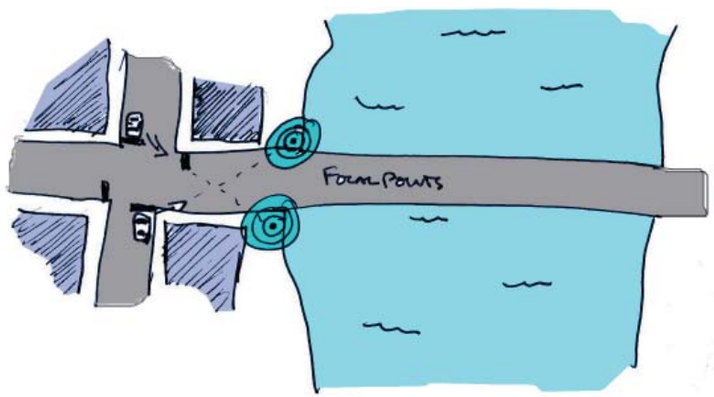

Figure 11.11. Stoplights and intersections.

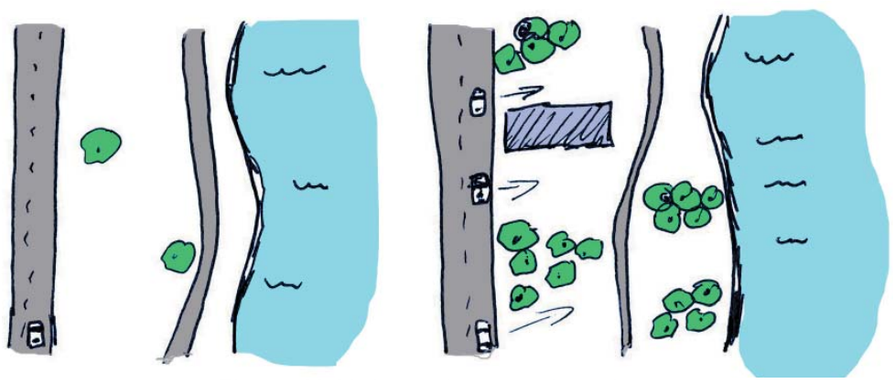

Figure 11.12. Long views vs. short views.

DOWNTOWN SCALE VIEWS

TO CONNECT VIEWS TO WATER FROM GREAT DISTANCES CONSIDER THE ANGLE OF SIGHT TO THE WATER

USE LIGHTING TO CREATE VISUAL CONNECTIONS TO THE WATER AFTER SUNSET

STREET SCALE VIEWS

STOPLIGHTS AND INTERSECTIONS SHOULD HAVE VIEWS TO RIVER FOCAL POINTS

- **A STOPLIGHT IS A GREAT PLACE FOR PEOPLE TO LOOK AROUND BECAUSE THEY ARE NOT FOCUSED ON DRIVING**
- **THIS OPPORTUNITY PRESENTS A PLACE TO GRAB THE ATTENTION OF THE PASSERBY**

LONG VIEWS ALONG RIVER BANKS ARE NOT IDEAL. A RHYTHM OF OPENINGS TO THE RIVER CREATES A FEELING OF MYSTERY AND DISCOVERY. A LONG VIEW IS MONOTONOUS AND BORING

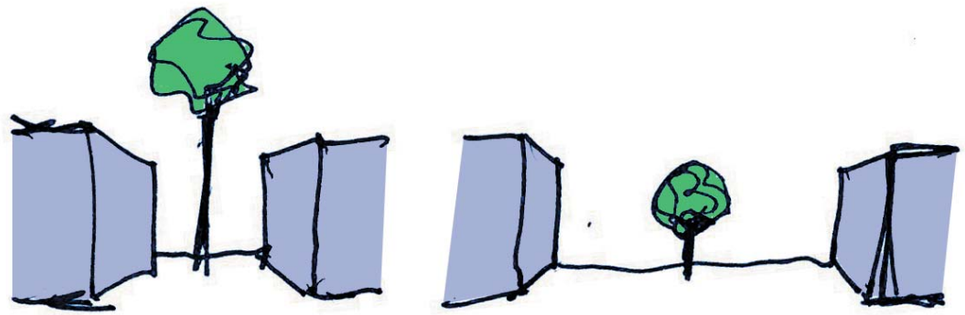

Figure 11.13. Pronounced focal point.

SMALL OPENINGS TO THE RIVER NEED MORE PRONOUNCED FOCAL POINTS BECAUSE OF THE REDUCED TIME AVAILABLE FOR THE VIEW

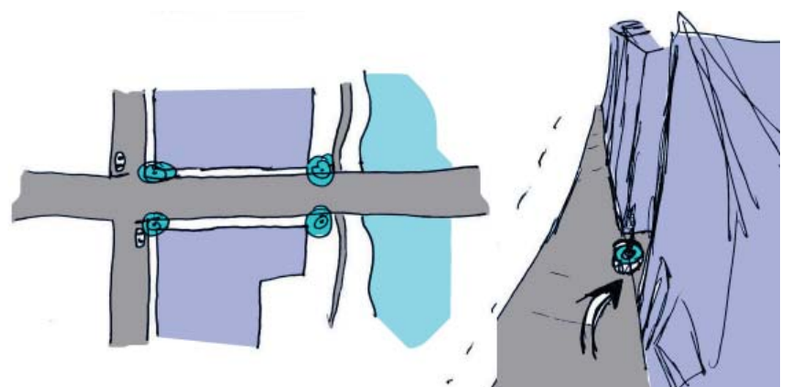

Figure 11.14. River identifier.

IF AN OPENING LEADS TO THE RIVER, THERE SHOULD BE A RIVER "ANNOUNCEMENT" WHERE THE OUTSIDE VIEW REACHES

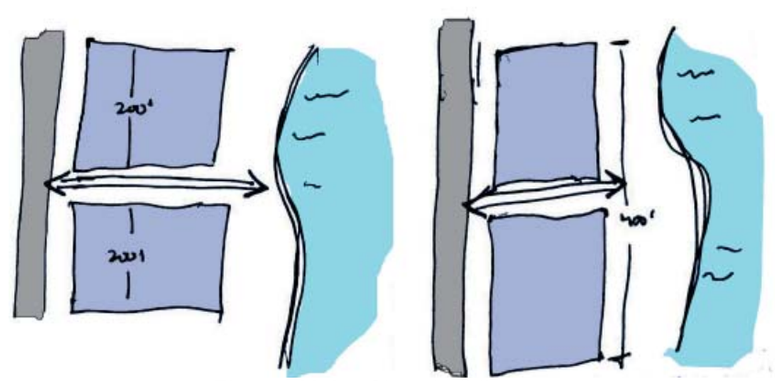

Figure 11.15. Short building expanses.

THERE SHOULD BE A VIEW TO THE WATER ONCE EVERY 200 FEET AND THERE SHOULD BE NO EXPANSE OF IMPENETRABLE BUILDINGS GREATER THAN 400 FEET WITHOUT A BREAK

PEDESTRIAN SCALE VIEWS, PHYSICAL ACCESS, SOUNDS

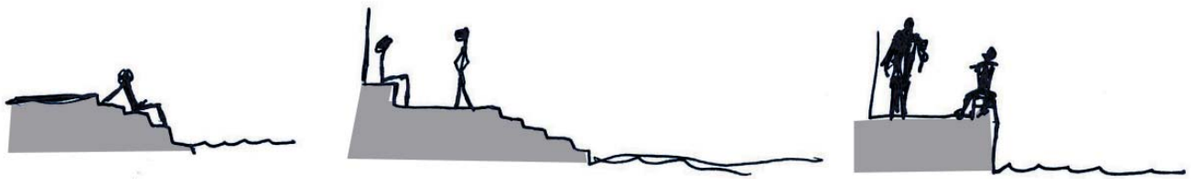

Figure 11.16. Seating on banks.

THE BANK NEAR THE WATER'S EDGE SHOULD ALLOW FOR SITTING AND OBSERVING

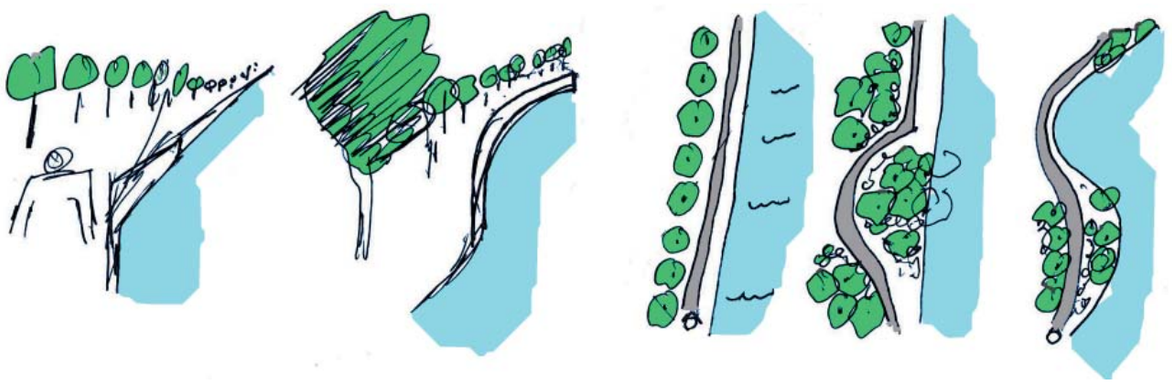

Figure 11.17. Discovery along river's edge.

VIEWS TO THE BANK AHEAD SHOULD BE LIMITED ALONG THE RIVER'S EDGE TO ALLOW FOR DISCOVERY

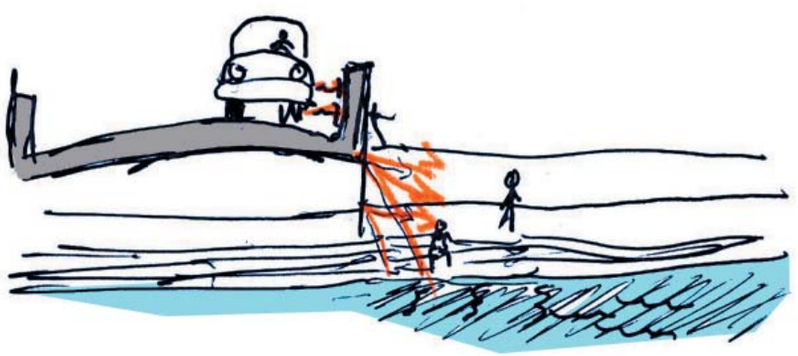

Figure 11.18. Sound barriers.

WHERE THE STREET IS CLOSE TO THE RIVER, THERE SHOULD BE SOUND BARRIERS

- VEHICLE SOUNDS WILL BE BLOCKED OUT
- RIVER SOUNDS WILL BE HARNESSED FOR THE PARK

BIBLIOGRAPHY

Case Study Findings

The Inner Harbor, the Carroll Creek development, and the Georgetown waterfront all have constructed barriers to the waterfront. The Inner Harbor is the most successful in connecting the water to the city and waterfront users. The Inner Harbor provides some access points for physical contact with the water, architecture that focuses on both street and water, and safe pedestrian access across busy streets that surround it. Although the streets surrounding the harbor have safe pedestrian crossings, the width of the roads at six lanes, can make crossing a taxing event. The next most intimate waterfront is the Carroll Creek development because its flood control treatment allows immediate water access within the pedestrian area. The buildings and transportation infrastructure on or near the waterfront do not connect the rest of downtown with the waterfront and therefore do not enhance the potential for intimacy. The Georgetown waterfront on the Potomac River provides a limited intimate experience throughout its waterfront with less physical access to the water, even though the architecture of the building addresses both the street and the river. The parkland area and the parking lot do not provide physical access to the water because of the high walls on the river's edge. The Whitehurst Freeway effectively screens the waterfront view from the rest of Georgetown. Although the three waterfronts studied possess barriers to an intimate experience with the water, they also offer activities or structures to enhance intimacy.

The Inner Harbor and the Carroll Creek waterfronts provide paddle boat and kayak rentals, which allow for the most intimate waterfront experience. The Inner Harbor also has water taxis for a different type of transportation experience that is linked

BIBLIOGRAPHY (continued)

directly to the harbor. The Inner Harbor and the Georgetown Harbor have places for boaters to tie up, so they can use the amenities of the waterfront. The Carroll Creek development and the Inner Harbor use pedestrian bridges that give waterfront users a different perspective above the water.

Landscape architects, architects, planners, and other professionals involved in riverfront development need to address common functional urban waterfront structures such as transportation infrastructure, poorly sited buildings, and flood control measures in their designs because those structures can subtract from the success of waterfront design projects by disconnecting waterfront users from the river itself. This resulting disconnect is problematic given the intrinsic relationship between humans and water. If designers use the guidelines in this thesis to create opportunities for visual, auditory and physical access to the water and interesting waterfront structures, waterfront users will achieve an intimate relationship with the water and waterfront development that will lead to the revitalization of a formerly depressed urban waterfront.