RECLAIMING THE RIVERFRONT AS CATALYST FOR NEIGHBORHOOD REVITALIZATION: AN URBAN DESIGN PROPOSAL ALONG THE WHITE RIVER IN MUNCIE, INDIANA.

A CREATIVE PROJECT
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SHUO LIU
ADVISOR: DR. BRUCE RACE

COLLEGE OF ARCHITECTURE AND PLANNING
BALL STATE UNIVERSITY
MUNCIE, INDIANA
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ABSTRACT

CREATIVE PROJECT: Reclaiming the Riverfront as Catalyst for Neighborhood Revitalization: An Urban Design Proposal along the White River in Muncie, Indiana

STUDENT: Shuo Liu

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This creative project explores urban riverfront redevelopment as a catalyst for revitalizing Muncie’s urban neighborhoods. The project illustrates urban design benefits of enhancing human interaction with natural river environments. It considers the White River corridor as a recreational and natural system that can improve the quality of life for contiguous neighborhoods by adding social and economic value.

Located in Muncie, Indiana, this creative project defines how dynamic cities benefit from mixed-use riverside redevelopment with leisure activities. It discusses why riverfronts are important recreational assets for cities; how riverfronts can provide opportunities for leisure, and time away from the cares and toils of urban life; and how urban riverfront plans include leisure and recreational activities.

Research includes a literature review and three case studies of Midwestern city riverfronts. Findings are summarized as best practice urban design principles, with
criteria for recreation, protecting natural environments, and housing, street, and block
typologies. The creative project includes evaluation of potential social and economic
benefits of the riverfront redevelopment.

The report has five chapters, including an introduction, a review of literature, case
studies, a creative project description, and conclusions.
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CHAPTER 1: INTRODUCTION

1.1 Introduction

Almost all of the world’s major cities and urban areas have been founded and developed along rivers. History indicates an inseparable relationship between water and civilization. Significant achievements in trade, transportation, and industry all have relationships with water. Rivers have always provided habitat for flora and fauna. Throughout history, rivers have been important sources of food and provided ideal places for settlement. The ancient Chinese originated along the Yellow River Basin, ancient Egyptians along the Nile, ancient Indians along the Ganges, and ancient Babylonians along Mesopotamia.

In modern times, urban river spaces have been neglected until rivers became contaminated with waste water, experienced catastrophic floods, saw declining biodiversity, and so forth. With changing attitudes towards nature, urban rivers and their environments are currently being developed into the most prestigious sites in cities. Hard hydraulic engineering, soft planning, and urban design all pay attention to rivers. City dwellers today demand urban riverscapes to be more attractive, with public open spaces along rivers. Another reason rivers have been increasing in value is the economic
competition between cities since rivers are a powerful locational factor for development. Therefore, riverfronts have been required for technical hydraulic engineering and transportation, maintained in good condition, deliberately designed, and revitalized for human and benefits (Prominski, 2012).

1.2 Research Aims

The purpose of this creative project is to estimate whether riverfront reclamation is the catalyst for neighborhood revitalization, define how dynamic cities benefit from riverside leisure activities, and apply this knowledge to a site in Muncie, Indiana.

1.3 Research Questions

Three research questions guide this creative project and provide a main direction for literature review. Literature review helps to consistently understand the theoretical context. The sources reviewed discuss strategies, policies, methods, and techniques for successful mixed-use riverfront redevelopment. Three research questions are:

- Why are riverfronts important recreational assets for cities?
- How can riverfronts provide opportunities for leisure time away from the cares and toils of urban life?
- How are leisure and recreational activities included in urban riverfront plans?

1.4 Significance of the Study

Flowing through central and southern Indiana, the White River is important from the regional scale to the neighborhood scale. It has been highly valued by both cities and
citizens, with much input from public and private sectors. It is also an ideal habitat for wildlife, aquatic species, and vegetation. As the White River passes through Muncie, much of this habitat has been disrupted by urban development.

The White River is the largest tributary to the Wabash River, which is the official state river of Indiana, flowing southwest from northwest Ohio across northern Indiana to southern Illinois. The Wabash River drains two-thirds of the state (over 33,000 square miles) and is also the longest free-flowing river east of the Mississippi. The White River is an important component of the Midwest river system. It has two forks: an East and a West Fork. The West Fork winds through the city of Muncie (wabashriver, 2013).

At the city scale, the White River links parks, neighborhoods, schools, downtown and community resources. The river provides habitat for 69 species of fish, 16 species of freshwater mussels and 500 species of aquatic insects (White River Greenway Master Plan, 2000).

The city has been paying attention to development along the river since 1923, when the Muncie Park Commission announced a vision for constructing a linear parks system that would follow the banks of the White River. Established in 1972, the city Bureau of Water Quality continues the effort of restoring the water quality through their internationally recognized industrial wastewater pretreatment program (White River Greenway Master Plan, 2000).

Recently, citizens also valued the White River as one of the area’s best assets by during the Muncie-Delaware Comprehensive Master Planning process (White River Greenway Master Plan, 2000).

This creative project helps define how dynamic cities benefit from mixed-use
riverside redevelopment with leisure activities.

1.5 Research Methods

The research methodology focuses on literature review and case study to identify best practices for an urban design model along the White River. The project will determine potential benefits that urban design models can contribute to enhance human interaction with nature. The urban design covers a concept plan and detailed plans.

1.6 Outline of Chapters

The introduction chapter presents research aims, research questions, research methodology, significance of the research, and the chapter outline. It also announces the purpose of this project: defining how dynamic cities benefit from mixed-use riverside redevelopment with leisure activities.

The literature review is a narrative examining credible primary and secondary sources that relate to each case, and show the trend, state, major debates, popular theories, methodologies, and gaps according to the research topic. This chapter will explore why urban riverfront recreations can revitalize cities, how riverfront urban design can provide opportunities for leisure in a strategic perspective, and how cities organize different “actors” include recreation activities in urban riverfront plans.

This project will also use the methodology of case study. This chapter will focus on three cases: St. Paul, Minnesota, Nashville, Tennessee, and White River State Park, Indianapolis, Indiana. The purpose of discussing these cases is to find and estimate the riverfront redevelopment urban design models for riverside leisure activities. Then a
comparison will be made among these three cases to summarize the best practice creative features for building an urban design model.

The creative project description chapter covers site context, suitability analysis, design criteria, planning method, concept plan, and detailed design.

The conclusion chapter summarizes general ideas involved in this creative project and makes suggestions for further study.
CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Literature review is a narrative examination of credible sources that relate to the research questions. It shows trends, major debates, contemporary theories, methodologies, and what is less understood about the research topic.

In this chapter, the literature review helps define the different ways cities benefit from urban riverside leisure activities from an urban design perspective. Literature sources are chosen based on three research questions: how urban riverfront recreation benefits cities, successful urban riverfront design strategies in the Midwest, and organization strategies involved in riverfront planning.

2.2 How Urban Riverfront Recreation Benefits Cities

Urban riverfronts benefit cities socially and economically. From the perspective of social benefits, urban riverfront recreation provides emotional needs, passive recreation, sustainability benefits, microclimate, community identity, and habitat preservation.
International-scale natural environment preservation mainly focuses on large, biodiverse and relatively untouched ecosystems; individual flora and fauna species; and endangered types. However, less attention has been paid to nature close to urban life. Preserving urban nature is an important strategy for enhancing residents’ quality of life (Chiesura, 2004). Urban riverfront is an important component of natural area. It provides social and psychological services, which increase the livability of modern cities. Natural recreation experience may reduce stress, enhance contemplativeness, rejuvenate city dwellers, and offer a sense of peacefulness and tranquility. Many studies demonstrate the restorative function of natural environments. For example, hospital patients recover faster if they can look out on trees and nature from their window. Natural environment also has a positive influence on psychological health (Chiesura, 2004). As a natural element, urban riverfront recreation benefits citizens’ well being by providing emotional and psychological needs.

Compared to “active recreation,” “passive recreation” refers to recreational activities that do not require prepared facilities like sports fields or pavilions. Placing minimal stress on a site’s resources, passive recreation can provide ecosystem service benefits and is highly compatible with natural resource protection (U.S. EPA, n.d.). Urban riverfront passive recreation can include camping, hiking, viewing wildlife, observing and photographing nature, picnicking, walking, bird watching, exploring history and archaeology, swimming, cross-country skiing, bicycling, trail running/jogging, fishing, etc. (abstracted from U.S. EPA, n.d.). Passive recreation offers significant unique benefits, such as protecting natural resources and restoring ecosystem
services. It also shares benefits with active recreation, like improving community health and promoting economic development (U.S. EPA, n.d.).

In terms of sustainability, less attention is paid to natural components and green space in urban area than to man-made components in urban environments (Chiesura, 2004). Once one of the most abused and degraded American waterways, the Los Angeles River has been restored from brownfields and urban run-off. The city has less park space per capita than any major urban area in the United States. However, since the restoration, it enhances the quality of life along the river; connects separate communities to stem urban sprawl; strengthens local economies; brings awareness to the area’s forgotten natural and cultural heritage; improves water quality; increases local water resource availability; restores native habitats; provides more opportunities for public art; promotes bicycle commuting; and creates more recreational activities (Otto, McCormick, & Leccese, 2004). Sustainability is promoted in aspects of habitat, natural resources, sprawl prevention, economic development, and quality of life.

Riverfront recreation has a surface structure that produces an environment with specific microclimate qualities to balance energy of individuals’ “thermal perception” (Mahmoud, 2011, p. 2641). The evaporative power of water bodies increases human thermal comfort and reduces negative health effects during warm summers. Water bodies can limit the urban heat island effect and undesirable human thermal comfort (Steeneveld, 2014). Recreation along riverfront mitigates heat stress during extreme weather situations. For example, microclimate benefits can come from green infrastructure and water-sensitive urban design, vegetated public realm, hydrology strategies, etc. (watersensitivecities, 2014).
Another reason that urban riverfront reclamation benefits cities is that it increases community identity and social cohesion. “Rivers play a vital role in the community by encouraging social interaction and bonding.” River corridors bring communities together in positive actions, fostering a community spirit, pride in the environment and a sense of belonging (RESTORE, 2013). Rivers are usually parts of human settlements, carrying communities’ local cultures, religions, and spiritual values.

In addition, urban riverfront restoration benefits habitats and biodiversity in a context close to where people live, work, and enjoy small-scale green areas. The only way aquatic biodiversity thrives is in irregularly shaped riverbeds and riverbanks, where fish, amphibians and insects can hide from predators. Biodiversity also requires natural water, which connects habitats in wider surroundings and purifies water. This is important both for human and wildlife use. By preserving ecosystems, river restoration contributes to biodiversity (RESTORE, 2013).

From the economic perspective of urban riverfront recreation, reclaiming rivers and riverfronts can significantly increase services provided by healthy ecosystems. For instance, in New Mexico, the effort restoring the Middle Pecos River is a good example of demonstrating economic benefits of recreation restoration. Funded by the state’s River Ecosystem Restoration Initiative in 2007, the Pecos River project annually draws 150,000 visitors to Roswell. This project was accomplished without increasing the net depletion of water. One significant achievement is the revenue generated from tourism. Wildlife viewing, which includes bird watching, is the single largest national recreational activity. This project also provides healthy rivers that support industry through long-term sustainable economic growth. River restoration also creates jobs for local residents. The
Department of Interior estimates that every $1 million invested in restoration created an average of 30 jobs, largely in the private sector. Restoration also leverages federal and private funding and services (Bardwell, 2011). This case clearly illustrates that riverfront restoration generates economic benefits.

In summary, urban riverfront recreation can benefit cities in many different ways, especially for residential areas. Yet, they are neglected compared to single large ecosystems. The small-scale green areas are more likely benefiting urban dwellers and their own habitats.

2.3 Urban Riverfront Design Strategies

Urban riverfront plans require harmonizing flood control, environmentally sensitive recreation, economic development, and strategies that enhance rivers’ ecological systems. Every riverfront redevelopment requires a unique combination of strategies, which mirror current development intensity, planned development intensity, riverfront constraints, and intended outcomes (Otto, McCormick, & Leccese, 2004).

After reviewing several sources, seven strategies stand out for urban riverfront design. The first thing to know in strategies should be plan context, which pinpoints community characteristics for the whole plan. Second, an urban riverfront plan should have multiple aims to adapt varying demands. Third, identifying major players in the plan is important since success requires broad participation from different community groups. The other strategy is protecting rivers’ natural features by designing from a broader context to keeps river development on the right track in a regional watershed scale. Successful waterway design is impossible without connections between rivers and
neighborhoods, which means public access is the key for riverside neighborhood revitalization and recreation development. The last strategy encourages people to get to know their river with riverfront signage interpretation systems. These seven strategies are crucial for successful urban riverfront design.

2.3.1 Identifying Riverfront Plan Contexts

Tailoring riverfront plans to fit different contexts prevents urban riverfront development from a “me-too” mentality. Ideas transplanted from other places often do not work. Since every riverfront has unique conditions, planners should carefully define their urban riverfront before applying these ideas. Four factors define waterway contexts: river size, development intensity, infrastructure, and watershed planning (Otto, McCormick, & Leccese, 2004).

Defining river size starts with knowing the stream order classification system. Stream systems are classified by their relative position in a stream network. This classification explores similarities and differences between streams. Arthur Newell Strahler developed the Strahler Stream Order system in 1952, classifying streams according to the power of their tributaries. In this system, the smallest headwater tributaries are called first-order streams. Where two first-order streams meet, a second-order stream is created; where two second-order streams meet, a third-order streams is created; and so on. Stream order is important because it affects drainage area and stream size. Many headwater streams in the Midwest region of the United States are constructed agricultural ditches or have been deepened to facilitate the removal of excess water from agricultural fields. Stream order is also important for forecasting changes in topography
and hydrology. It makes a template for biological community adaptations (Ward, D’Ambrosio, & Mecklenburg, 2008). Urban rivers and rural rivers are quite different. In an urban river corridor, fourth-order or higher streams have been developed as neighborhoods or for commerce. Precisely classifying river size is essential for restoring riverfront, because different stream orders have different functions (Otto, McCormick, & Leccese, 2004).

Another concept for defining river contexts is development intensity, which is classified by the percentage of impervious surfaces (Otto, McCormick, & Leccese, 2004). For example, buildings, streets, parking lots, sidewalks, and roofs are hard surfaces. The biggest problem facing urban watersheds and streams is excessive impervious coverage. When streams run through watersheds with high levels of impervious coverage, their volume dramatically increases due to run-off. Two-thirds of all impervious coverage today is for cars. Even a mere 10% of impervious surface doubles stream volume (Schueler, 2006). Impervious cover varies along riverfronts from dense urban areas to naturalized suburban areas. Goals for urban riverfront redevelopment should respond to specific site conditions (Otto, McCormick, & Leccese, 2004).

Infrastructure such as street networks, bridges, sewers, and storm-drain pipes present significant challenges for reclaiming riverfronts. They jeopardize water quality, wildlife habitat, and public access. Identifying infrastructure before planning is important for context analysis (Otto, McCormick, & Leccese, 2004).

Watershed is a land area drained by a river and its tributaries. The river’s health cannot be improved without comprehensive treatment of stormwater and pollution sources across the whole watershed (Otto, McCormick, & Leccese, 2004).
Encouraging plans to fit into unique riverfront contexts is important for urban waterway restoration. Therefore, context identification should be the first strategy involved in urban riverfront plans.

2.3.2 Determining Multiple Planning Aims

Implementing a scheme that has a wide range of benefits for people and the environment is likely to draw greater public support. For example, urban riverfront restoration benefits both cities and environment by creating access and recreation, green spaces, biodiversity, heritage and cultural environments, education, natural flood risk management, maintenance cost, and so forth (RESTORE, 2013). Urban waterfront redevelopment is often interwoven with recreational trails and wetlands. A plan will not be possible or even desirable if it only focuses on a single economic development or environmental preservation. Riverfront plans aim to boost cities’ economic development while protecting natural features, reducing riverfront damage, and improving public access. Riverfront communities will benefit from integrating and balancing ecological, social, and economic concerns (Otto, McCormick, & Leccese, 2004).

2.3.3 Community Participation in Riverfront Planning

Waterfront projects, which benefit people and wildlife, ensure better value. First, it is important to network local experts. They provide detailed information and local knowledge, including current pressures, risks to watercourses, and opportunities to improve local environment. Obtaining information from local authorities helps new riverside plans incorporate existing planning strategies and neighborhoods desires.
Community approach is also vital to success. Local people are important but often undervalued resources in the design and implementation process. Community approach includes consulting with local residents and businesses to bring a number of benefits. Encouraging and communicating with local residents creates a sense of ownership. Community members offer fresh insights for how to approach problems. Third, involving interested groups ensures new plans consider everyone’s needs and priorities. Interested organizations include river and wildlife trusts which provide river conservation and education; local authorities or municipalities; environmental bodies who manage projects; academic institutions who monitor projects; design organizations; private sectors; landowners who can support long-term projects; and so on (RESTORE, 2013).

Urban riverfront plans need various community members to participate, including traditional stakeholders, local experts, local residents, and all other interested groups. Only when different groups are involved can riverfront plans ensure everyone works toward the same vision (Otto, McCormick, & Leccese, 2004).

2.3.4 Protecting Natural River Features and Functions

Rivers’ long-term health is vital to people who enjoy more natural riverfronts. Healthy, functioning rivers are appealing and attractive to residents. Besides economic benefits, rivers’ ecological goals have received more attention, including flood control, water quality improvement, and so on (Otto, McCormick, & Leccese, 2004).

Urban riverfront plans should protect rivers’ natural features and functions. Many governments in European countries have committed to “ecosystem service approach.” Ecosystem services are the benefits provided by the natural world such as clean water, air
and soil. For example, the Mayes Brook restoration project in the UK created the first climate change adaptation park. Reconnecting the river with its floodplain has increased flood storage by one hectare. The river corridor provides a “green network,” which dramatically improves natural infrastructure. This project also increases a greater feeling of safety for local residents and visitors (RESTORE, 2013).

Other river natural feature protection strategies include: buffering sensitive natural areas, restoring riparian and in-stream habitats, using nonstructural alternatives to manage water resources, reducing hardscapes, managing stormwater on site, and using nonstructural approaches (Otto, McCormick, & Leccese, 2004).

2.3.5 Designing for Larger Context

Urban riverfront design should consider development in rivers’ natural structural context, which includes characteristics of the watershed; the floodplain and river channel with structure of its bed and banks; hydrology; water chemistry; and biological needs of wildlife, including insects, fish, amphibians, reptiles, birds, and mammals. Riverfront corridor planning is best performed within the context of sound watershed planning, which is conducted at a much larger scale (Otto, McCormick, & Leccese, 2004).

2.3.6 Connection, Public Access, and Recreation Uses

The purpose of improving connection is increasing public use. “‘Connectivity’ is a key concept for riparian and landscape ecologists and hydrologists, who use it as a measure of natural integrity in a river ecosystem. Urban designers and politicians use the same term to promote human access to riverfronts.” Approaches for connecting riverfront
to neighborhood include biophysical, cultural, design, and cognitive approaches (May, 2006). More specifically, successful waterfront projects are designed to include spaces that accommodate recreation, such as parks, trails, docks, and places for public assembly. “Good riverfront designs consider the needs of all neighborhoods, ages, and cultures in the community. They allow community members to experience the river up close.”

Physical and visual access creates lively, diverse places that encourage a sense of belonging and “an appreciation for nature” (Otto, McCormick, & Leccese, 2004, p. 37).

High accessibility is important for attracting people to riverfronts. Connections between rivers and neighborhoods can be both physical and visual. Successful riverfront plans carry many uses, including active recreation such as soccer or golf, and passive recreation such as bicycling, walking, or bird watching. “Economic revitalization along riverfronts, such as new mixed-use development with housing, restaurants or cafes, and open space, is more successful when it includes visual and physical access to the water” (Otto, McCormick, & Leccese, 2004, p.37).

Riverside connectivity should also balance recreation and public access with river protection. “Riverfront communities should provide facilities for as many recreational uses as possible while balancing some conflicting uses (for example, between power boats and bird watching platforms) and managing possible overuse of the river corridor” (Otto, McCormick, & Leccese, 2004, p.87).

Riverfront connectivity is important for waterway plans. River communities should provide recreation along water, but also balance public access with environment protection.
2.3.7 Reflect Environmental and Cultural History

Riverfronts are rich both in human and natural history, so their design should extend community culture through informal and formal education. Ecological education along urban rivers is meaningful. Rivers can be powerful tools for science and nature education. From an urban design perspective, signage systems explain rivers’ special features. People should be invited to participate in activities so they can explore the riverfront while learning cultural information.

2.3.8 Summary

Seven urban riverfront design strategies have been highlighted. At the beginning of riverfront planning, site context should be identified to review the community’s unique features and relationship to its river. Riverfront plans also require multiple aims. Main users and interested groups are important and should be invited to participate in planning processes. The allure of a healthy, functioning riverfront to residents and visitors indicates that new riverfront plans should protect rivers’ natural features and functions. Designing starts with broader-scale benefits more than with only urban river scale. To draw people to the riverfront, mixed-use, public access, and recreation uses are the keys for increasing riverfront connectivity with neighborhoods. Lastly, a successful waterfront redevelopment plan should mirror the river’s environmental and cultural history.

2.4 Organization Strategies

In their article “Introduction to ‘Political ecologies of urban waterfront transformations,’” Bunce and Desfor (2007) explain political ecological issues involved
in waterfronts. “Contemporary urban waterfront transformations both reflect and constitute changes in governances, economic regulation, and societal imaginaries of the non-human environment” (p. 251). Urban waterfront transformations affect economic restructuring of human interventions in the non-human environment. This transformation includes issues of urban political economic regulations, governance practice restructurings, urban ecology and social relationships with nature, urban planning theories and practices, plus cultural politics and civil society actions (Bunce & Desfor, 2007).

Edited by Harry Smith and Maria Soledad Garcia Ferrari in 2012, the book *Waterfront regeneration: Experiences in city-building* originated from a research project called the Waterfront Communities Project (WCP), funded by the section of the European Commission focused on the North Sea. The WPC involved nine North Sea port cities. The book explains the current change in waterfront regeneration, which is a response to processes of globalization. Thus, theories and strategies considered in this book are in the global context. Authors discuss the impact of globalization and the relationship between waterfront regeneration and city-building. The book presents three analytical frameworks for negotiating city-building in waterfront communities around the North Sea. These three frameworks include allocative structures, authoritative structures, and systems of meaning from a political economy perspective (p. xiii).

City-building contains complex interactions among actors and organizations, among local communities and the wider public. Results of interactions include benefits generated and places developed for people. Key issues consider interactions influencing
how places are created, who is involved, who benefits from the new waterfront, what the state’s involvement should be, and so forth (Smith & Ferrari, 2012, p. xiii).

With a brief discussion about the North Sea port transforming history, the book presents the idea of the “action research model.” The North Sea’s traditional harbors were gateways to cities. However, the decline of industry and the consolidation of business left vast underutilized former industrial land. Land use led cities to rediscover waterfronts by refurbishing historic buildings and adding new development. However, these are not enough. Then, as part of the solution, waterfront redevelopment with high-tech appears in the 21st century. Yet, this effort brings “risks that generation is dominated by the interest of speculative property development, ignoring residents’ pressing need for socio-economic renewal and wider public benefit.” In other words, financial gain has overshadowed human interest. “Another risk is superficial redevelopment aimed at providing housing for wealthy households and/or tourist facilities.” To reduce these risks, the first step is to link lead partners with their academic partners, and link cities to research organizations (Smith & Ferrari, 2012, p. xiv). This is the main idea of the “action research model.”

In the action research model, city governments build relationships with local research organizations, who work with practitioners to better understand their own institutional environment. By doing this, researchers can best tailor practitioners’ responses to fit their environment, and achieve organizational and policy objectives. “In this context, cities and local research organizations work steadily to improve the quality of governance.” This relationship is based on cooperation among governments, citizens,
research teams, and other stakeholders. This cooperation provides constructive feedback (Smith & Ferrari, 2012, p. xiv).

The action research model also assists research organizations to obtain “direct results of innovation in policy, planning and implementation.” This model also involves intervention from researchers, which leads on-going studies. The action research model replaces “the neutral observer with a multidisciplinary learning group” as well. Finally, the action research model “always attempts to generate adaptable learning from urban management experiences” (Smith & Ferrari, 2012, p. xv). It bridges the gap between urban planning decision makers, professionals, and academics (Smith & Ferrari, 2012, p. 17).

The three analytical frameworks presented in this book are allocative structures, authoritative structures, and systems of meaning from a political economy perspective. These are tools for generating “critical consciousness” in waterfront regeneration. Allocative structure has been discussed in terms of land resources, finance, human labor, materials and energy, and “institutional resources.” Since the 19th century, lands have been controlled by public or semi-public bodies as cities have expanded along water. Now waterfront changes are transferring lands from public to private-sector owned. Key factors are how these lands are parceled up, and who controls them. “For example, allocation of large areas of waterfront to large developers, to master plan and development as a single concern are seen as contusive to different results compared to allocation based on small-scale plots going to different developers and designers.” With regards to financing, public sectors often finance cleaning up sites and building key infrastructures. Private sectors invest lands after public sectors’ process. In terms of
“institutional resources,” new organizations are always created during the waterfront redevelopment process. Each having different influences on development, these new organizations also generate existing organization restructurings. They are crucial for implementing waterfront redevelopments (Smith & Ferrari, 2012, p. 17, pp. 22-24). Therefore, three very important components have been highlighted in allocation structure: land uses and land owners, financing, and “institutional resources.” These identify how public and private sectors interact, and how they affect the creation of new organizations for implementing waterfront projects.

Authoritative structure “can take the form of organizational arrangements, including…different levels of state organization, from local, national and regional through to transnational.” Globalization is broadening the complexity of these relationships. “[The] partnerships between state-sector organizations and private-sector companies have become a widespread norm for investment in infrastructure, and are also characteristic of key examples of waterfront redevelopment.” There are two major shifts in authoritative structure in terms of waterfront regeneration: increasing participation from private sectors, and varying forms of public sector engagements. For example, waterfront regeneration projects around the North Sea are mainly public-sector driven. Meanwhile, private-sector participation is increasing by establishing new companies to manage previously public-sector assets, and engaging private sectors as partners in waterfront projects. The North Sea also has experience in civic engagement (Smith & Ferrari, 2012, p. 24, p. 207).

Systems of meaning “permeate actions related to city-building at many levels.” Smith and Ferrari (2012) point out that urban planning and design play important roles in
the interaction between systems of meaning and the political economy. High quality of urban space is a factor that attracts investments and increases cities’ competitiveness. A good urban environment is “now increasingly seen as enablers of economic growth” (p. 26).

In conclusion, Smith and Ferrari’s book explores the complexity of applying city-building in waterfront redevelopment. To improve interactions between different sectors, the “action research model” builds a strong relationship between research organizations and practitioners during institutional environment analysis. Then, three important analytical frameworks explain how to coordinate different sectors during the waterfront redevelopment process, plus the trend of partnerships involved in waterfront projects. The last analytical framework, “systems of meaning” explains the importance of a good urban design for urban environmental building and economic growth.

From a developer’s perspective, Barry F Hersh’s book The Complexity of Urban Waterfront Redevelopment (2012) discusses waterfront brownfield revitalization in terms of regulatory and funding strategies at the federal, state, and local levels. Based on several cases, this study suggests specific strategies for mixed-use redevelopment of formerly contaminated waterfronts. Hersh’s suggestions mainly facilitate private-sector-led urban waterfront redevelopment, including involvement of regulation and funding at all levels, impact analysis, and mitigation strategies. Strategies discussed in this study include “[l]eadership roles and team building; [i]nnovative financing tools, including government programs; [t]echniques such as charrettes, checklists and critical paths to aid information flow and support creative planning and design; [and s]pecific approaches to
difficult aspects such as acquisition strategies and synchronizing remediation and redevelopment” (Hersh, 2012, p. 4).

“There is a real estate truism that waterfront ‘always sells.’” Real estate institutions are interested in redeveloping contaminated waterfronts because developments on existing sites do not require much new infrastructure. “One benchmark study found that it took 4.5 acres of greenfields to accommodate that same growth as one acre of brownfield redevelopment.” With relatively high density and existing infrastructures, waterfront brownfields become strong market opportunities (Hersh, 2012, p. 5).

Brownfield is “a vacant or underused industrial or commercial property whose redevelopment is complicated by real or perceived contamination” (Public Law 107-118). As of 2011, the U.S. EPA ACRES database identified over 500,000 brownfield properties, totaling 15 million acres. “Waterfronts have often been industrial and often contaminated; a 2005 study of New York City found that over 40 percent of brownfields were along waterways, although this is likely a higher percentage than occurs nationwide.” Redevelopers restore a brownfield so that it is valued as conventional real estate (Hersh, 2012, pp. 5-6).

Hersh (2012) discusses several strategies in waterfront redevelopment, including leadership and building a team, approval strategies, roles of stakeholders, innovative financing, site acquisition strategies, synergy between remediation and redevelopment, and creating true mixed-use.

Waterfront redevelopment projects cannot be achieved without leadership and efficient teams. Developers are often the key leaders in these complex projects.
Successful waterfront projects require partnerships with elected officials, executives, legislators, and regulators. Teams including architects, hydrologists, civil engineers, environmental engineers, sustainable stormwater designers, and other possible specialists also play important roles in waterfront redevelopment. In terms of approval strategies, the main effort should focus on shortening the time period. “Projects build momentum, political support and market awareness; slowing down is almost always a negative.” (Hersh, 2012, p. 25). Successful waterfront projects always move forward quickly, “agreeing to land use or remediation requests, even at additional cost, in order to move ahead.” “Innovative approaches” such as Geographic Information Systems (GIS) and three-dimensional modeling can help projects, especially large-scale projects, achieve quickly. In terms of stakeholders, waterfront projects involve participants whom real estate developers may not familiar with. Therefore, multiple types of communication tools are required, including face-to-face contacts and charrettes (Hersh, 2012).

In terms of innovative financing, some typical methods such as construction loans, mortgages, and equity for acquisition are not enough. Hersh (2012) presents several innovative financing methods, including assessment funding, finding additional equity, the HUD Brownfield Economic Development Initiative, land acquisition, building financing, remediation assistance, waterfront assistance, and corridor and area-wide planning. With regards to site acquisition strategies, “[d]evelopers generally seek to control property for as little up-front cost as possible.” Waterfront brownfield redevelopment contains real risk such as tenants, business, or other potential users are not willing to come because of the contamination. “Looking at waterfront brownfields or similar complex redevelopment suggests rethinking acquisition strategy.” Developers
with environmental knowledge often can negotiate a lower purchase price for buying properties. Another way is government assistance on assessment and front-end risk reduction. Joint venture with a property owner is another site acquisition strategy, which may avoid “the expiration risk of an option.” Another strategy for waterfront redevelopment is synergy between remediation and redevelopment. Techniques for this include self-certification, presumptive remedies, Triad, new techniques, environmental liability protections and insurance and institutional controls. Presumptive remedies are guidelines for clean-up, generating quick design. Triad keeps updating remediation information while new gaps are identified during working process (Hersh, 2012, p. 32).

The last strategy is creating true mixed-use. Many successful waterfront redevelopments include mixed-use of “residential, commercial (retail, office and hotel), recreational, maritime and institutional uses that actually support one another.” This indicates waterfront design is essential, including “understanding the interactions between land and water, public access and private use.” Successful waterfront projects must consider “water-dependent uses” (Hersh, 2012, pp. 23-34).

From a developer’s perspective, assistance from the city, planners, designers and other relative participants is crucial for success during waterfront redevelopment process. Innovative approaches are required for shortening project timelines, and should be applied during redevelopment. Site acquisition strategies help purchase properties at a lower price and lower risks. Synergy between remediation and redevelopment makes projects efficient. Waterfront with brownfield always requires lengthy schedules, so faster and more efficient approaches should be applied if possible. True mixed-use
depends on high-quality design. Multi-function waterfronts with different design features attract people and investment.

In conclusion, contemporary waterfront redevelopment involves complexities of techniques, partnerships, and environmental and economic risks. A successful plan starts with a comprehensive site analysis. The “action research model” is a good approach for understanding institutional context by collaborating between research organizations and practitioners. Three analytical frameworks coordinate public, private, and non-profit sectors during waterfront redevelopment process, and interpret relationship between a good urban design and urban environment and economic growth. From the developers’ perspective, seven strategies solve problems considering complexities in waterfront redevelopment projects. These strategies deal with issues from partnerships to financing, from site acquisition to site design.

2.5 Literature Review Conclusions

Urban riverfront recreation benefits cities in different ways, especially for target residents. Small-scale green areas are more likely benefiting urban dwellers and habitats. Successful urban riverfront redevelopments reflect communities’ unique features during site context study. Multiple aims are required for involving vast stakeholders. New riverfront plans intend to protect natural water features, develop from broader scale rather than only urban river scale, and mirror rivers’ environmental and cultural history. The keys for improving connectivity include mixed-use, public access, and recreation uses. Waterfront redevelopment contains complexities of partnerships consulting and risk forecasting. The “action research model” enhances communication between researchers
and practitioners for better understanding of institutional context. Allocative structures, authoritative structures, and systems of meaning coordinate public, private, and non-profit sectors. Developers involved in urban riverfront plans can use innovative strategies to solve problems considering partnerships, financing, site acquisition, and site design.
CHAPTER 3: CASE STUDY

3.1 Introduction

In urban planning research, case studies provide opportunities to see how real-world projects address design strategies and policy issues. With real-world experiences, intuitional features, and similar contexts, case studies provide feasible ideas for further design and research.

3.2 Case Selection Criteria

Case selection criteria are prerequisites for choosing cases. The chosen site for this creative project is the White River in Muncie, Indiana. Thus, cases should cover riverfront redevelopment projects in Midwest cities, distressed neighborhood(s), or post-industrial sites. The three case studies are Nashville, Tennessee, St. Paul, Minnesota, and Cincinnati, Ohio.

3.3 Case 1: Nashville, Tennessee

3.3.1 Introduction

Along the Cumberland River, the Nashville Riverfront Concept Plan (2007) is
based on the Plan of Nashville urban design principles, which reflect the importance of the river as an “environmental, recreational, and economic development asset” (Nashville Riverfront Concept Plan, 2007).

Why the river is so important for this city

The planning area stretches almost 5.5 miles long and 1 mile wide. Today’s Nashville tries to attract residents back downtown, to Germantown, and to East Nashville. This trend is based on riverfront redevelopment. Most of the study area is dominated by single land use surface parking, which is underutilized but also presents a tremendous opportunity. Even with this inactive use, downtown Nashville hosts about 3 million tourists per year, but just a small fraction visit the river. “However, the recreational use of parks, LP Field and even the bridges has increased significantly and will potentially reach 2 million recreational visits per year when the Sounds Ballpark is complete” (Nashville Riverfront Concept Plan, 2007) (Figure 3.1).
Figure 3.1: Study area. (Nashville Riverfront Concept Plan, 2007).

According to the Nashville Riverfront Concept Plan (2007), the city’s “future (clearly) depends on expanding interesting mixes of new development opportunities, new open spaces, new transportation connections and new recreational boating opportunities that would work together to create a distinct and identifiable riverfront to complement and not compete with surrounding neighborhoods and downtown” (p.4).

Stakeholders in this riverfront redevelopment project

In 2005, Mayor Bill Purcell announced a collaboration between the Metro Nashville Parks and Recreation Department and the U.S. Army Corps of Engineers to produce the Nashville Riverfront Concept Plan. With consultation from the Nashville Civic Design Center, a 23-member Steering Committee guides the planning. More than a hundred stakeholders reached consensus on this concept plan, including government, businesses, community sectors (Nashville Riverfront Concept Plan, 2007).

General goals for this riverfront redevelopment project

“[B]eyond simply returning to its river[,] Nashville wants to reinvent its riverfront and in doing so shape its own future.” The Nashville Riverfront Concept Plan emphasizes the “importance of the river as an environmental, recreational and economic development asset” (Nashville Riverfront Concept Plan, 2007, p3).

General organizational strategies for this riverfront redevelopment project

The Nashville Riverfront Concept Plan has two strategies. One approach is more
conventional, taking large “bites” out of the riverfront and creating a spine of new
development. Another approach is more aggressive, creating an island and an inland
waterway. More ambitious, the island scheme offers more value and reflects Nashville’s
characteristics. The island scheme has four phases spanning 20 years.

The first phase is based on approximately $80 million public investment per year.
The Metro government and its State and Federal partners implemented phase one without
major land acquisitions. Unlocking the riverfront’s full potential, phase 2 and 3 include
developing affordable housing, transportation, open space projects, and brownfield
remediation simultaneously. Therefore, phase 2 and 3 require about $350 million public
investment to leverage about $1.4 billion in private investment. “This can only be
implemented by a true public/private partnership involving all levels of government,
property owners and the development community to draw on all advocacy, technical and
fund-raising skills” (Nashville Riverfront Concept Plan, 2007, p.5). The last phase
emphasizes restoring nature. Based on phase 3 Cayce Landing, which transforms the
current industrial uses into an affordable residential neighborhood and small businesses.
As industrial use phase out, phase 4 can locate newer development closer to I-24.

General benefits

With an ambitious 20-year plan, reinventing the riverfront’s benefits generate “(1)
economic development with private investment over $ 1.4 billion; (2) environmental
clean up of over 190 acres of degraded land with new ‘green’ development; (3) culturally
significant place for Metro Nashville to come celebrate, recreate and learn” (Nashville
Riverfront Concept Plan, 2007, p5). These achievements significantly promote economic
development, improve environment condition, and celebrate the local culture.

3.3.2 How did this redevelopment project design for recreation along the river?

The challenge of the Nashville Riverfront Concept Plan has been visualized as “a crane [bird], a football player, an ice cream cone, and a collection of barges.” The crane represents environmental issues. The football player represents Nashville’s sports-led economic recovery. The barges represent industrial shipping and working. The ice cream cone represents the “missing links for activating Nashville’s waterfront such as places for children and families, as well as venues which would support activities such as bike rentals, walking and touching the water, or enjoying an afternoon treat” (Nashville Riverfront Concept Plan, 2007, p.13). The “missing link” is recreation, including active and passive options for all ages. Phase 1 of this project starts with existing recreation improvement.
As shown in figures 3.2 and 3.3, improving the existing park is the first step for recreational development of this project. Re-branding its existing Riverfront Park (figure 3.4) provides attractions and events for local residents and visitors. Improvements include adding a river fountain, floating walkways, a family adventure playground, overlooks, piers, docks, and enhanced tailgating (Nashville Riverfront Concept Plan, 2007).

Phase 2 emphasizes creating an island, which is the most important concept of this project. It provides fantastic leisure opportunities, including a new inland recreational waterway, an indoor entertainment center, LP Field (figure 3.4), waterfront restaurants, picnic points, sports fields, esplanades, festival lawns, an outdoor music pavilion, urban forest tailgating, riverwalks, bridges, and a boulevard with multimodal transit options (Nashville Riverfront Concept Plan, 2007).
3.3.3 How does this redevelopment project include mixed-use design?

Cayce Landing (figure 3.2) transforms the current industrial uses into an affordable residential neighborhood with integral small business opportunities. The existing mixed-use is 3%. The island scheme proposes a new north/south boulevard, which acts as a spine for mixed-use development. It is concentrated between the Titans’ stadium and major transportation links. Mixed-use development starts at phase 2. Public meetings identified several needs: preserving mixed-use entertainment, public art, statues, main historic markers, existing greenways, existing public spaces, and Metro Center Lakes. Mixed-use residential development should cover the east side, mixing with service, amenities, and grocery stores. Major mixed-use development on the East Bank has density from medium to high. The mixed-use development also includes converting thermal site to mixed-use, and creating mixed-use park-like access (Nashville Riverfront Concept Plan, 2007).
3.3.4 How does this riverfront project protect nature through design?

During phase 4, the redevelopment extends to the north (downstream) of the Cumberland River. This phase is not as intense as previous phases. Phase 4 finds ways to restore natural habitat, eco-systems, and original river features. It encourages fishing, non-motorized boating, and so on. To protect natural structures, this project also applies infill during the last phase.

3.3.5 Summary

This Nashville Riverfront Concept Plan has a scale larger than a recreational river, and smaller than a working river. The general objective is to develop the river as an environmental, recreational, and economic asset. The general strategy is to balance the relationship among environmental issues, community identity, connectivity to the river, and working functions of the river. The future for Nashville waterfront is to expand interesting mixes of places, new open spaces, multiple choices of transit connections, and new recreations.

Lessons learned:

- Merging cultural and historical events or activities into design enhances community identity. Nashville makes commitment to the sports-led economic recovery.
- Improving existing recreational activities by adding contemporary waterfront activity concepts such as an island, inland recreational waterways, floating walkways, waterfront restaurants, overlooks, picnic points, sports fields, esplanades, festival lawns, and family adventure playgrounds.
- Creating different densities adapts different environments and economic potentials. Nashville’s densest, most dynamic areas are located near downtown, upstream and middle stream since these two sections contain more existing facilities which attract local residents and visitors. The downstream focuses more on natural environment protection.

- “Increasing Density” does not mean simply increasing population or building square footage. Depending on people’s needs, increasing density helps the riverfront create a dynamic city.

- Applying mixed-use development at waterfront hot spots provides many kinds of services for people of all ages.

3.4 Case 2: St. Paul, Minnesota

3.4.1 Introduction

St. Paul’s Great River Passage Master Plan (2011) addresses a 17-mile area along the Mississippi River, which has been called “the life blood of the nation, America’s fourth coast.” The master plan “presents recommendations for orienting the city toward the river and integrating new and enhanced parks and natural areas along all 17 miles of the Mississippi River through St. Paul” (Great River Passage Plan, 2011, p.5).

Why the river is so important for this city

St. Paul is located along the Mississippi National River and Recreation Area (MNRRA), which is a national park with significant cultural, natural, recreational, economic, scenic, and ecological resources. “The Mississippi River is connecting and
sustaining communities across cultures and generations.” “The river acts as working waterway, food supplier, and destination for recreation and adventure.” The Mississippi River is a rich legacy carrying the future for the city of St. Paul; therefore, future development must continue to protect it. The project covers over 3,500 acres, containing high-quality scenery, nature, culture, and history in an urban setting (Great River Passage Plan, 2011).

Industrialization of the upper Midwest made the Mississippi River an industrial corridor, bringing successive waves of immigrants from around the world. “The decline of industry has provided an opportunity to rediscover the river corridor’s natural, recreational, scenic, and spiritual qualities, and has prompted a discussion about new ways of living, working, and playing along the river’s edge” (Great River Passage Plan, 2011, p. 5).

*Stakeholders in this riverfront redevelopment project*

This project is led by the City of St. Paul Parks and Recreation Department, and guided by a Steering Committee consisting of City department leaders and Riverfront Corporation. Community leaders, public agencies, and major interested groups act together as a Community Task Force to guide this master plan. Stakeholders and the general public participate in design forums providing ideas and discussing issues (Great River Passage Plan, 2011).

*General goals for this riverfront redevelopment project*

General goals for this riverfront master plan are “More natural, more urban, and
more connected.” These goals represent “a grand vision for unifying the entire length of St. Paul’s riverfront. This plan sets the stage for natural spaces, recreation areas, ecological restoration and economic vitality while connecting the City and its people to St. Paul’s unique Mississippi River resources.” This project addresses the complex relationship between improving urban life and protecting natural system. Designing innovative parks, this plan assures the riverfront can be protected and enjoyed at the same time (Great River Passage Plan, 2011, p3).

**General organizational strategies for this riverfront redevelopment project**

In this master plan, landholders include the city, county, state, federal, and quasi-government agencies such as the St. Paul Port Authority and Metropolitan Airport Commission. Strategies used for land acquisition include land purchase, intergovernmental agreement, conservation/public use easements, public-public partnerships, public-private partnerships, and land dedication. The implementation strategy consists of consolidated operating budgets, a dedicated stewardship structure, and strong intergovernmental leadership (Great River Passage Plan, 2011).

### 3.4.2 How did this redevelopment project design for recreation along the river?

The Great River Passage Master Plan finds “gaps” for identifying key issues, covering natural and water resources, parks and open space, economic redevelopment, sustainability, access and connections, and art, history and culture.

Public meetings and design forums indicate that recreation needs along the waterfront are changing in St. Paul. The plan points out “[e]xisting recreation facilities
along the river need to be adaptable to changes brought about by a focus on healthy living, active lifestyles and new types of recreational pursuits.” Recreation trends turn from small recreation centers to “fewer higher quality community centers.” Nature-based recreation has become more popular, including “outdoor adventure, extreme sports, experiential team building and environmental education,” and a “network of walking, bicycling and boating trails that provide access for all ages and abilities” (Great River Passage Master Plan, 2011, p25). For adapting these changes, existing parks should have built-in flexibilities. Communities in St. Paul are more willing to have higher quality recreation rather than recreation with lesser facilities. Also, “third places” such as coffee shops, cafes, pubs, public spaces are increasing in demand for leisure and social lifestyle. Environmental awareness such as outdoor education and interpretive programs are also becoming more popular. Communities also require more community gathering choices and linear recreation along the waterfront. Improving public health by adding healthy foods, walkable neighborhoods, and active lifestyle features is also a priority of this master plan. “Urban agriculture” is a good way to provide healthy local food. Another trend for waterfront recreation is creating more compact neighborhoods, which gathers working, living, and enjoying environment. For local residents, off-leash dog parks are growing more popular. For both local residents and visitors, “cultural tourism” such as museums and exhibits are in high demand for community identity and deep experience (Great River Passage Master Plan, 2013).

The Great River Passage Master Plan (2013) defines “Nature-based Recreation” as places that provide both passive and active recreation for all age groups while celebrating the nature (Great River Passage Master Plan, 2013, p. 46).
Contemporary recreation needs more natural experience. “Activities such as canoe and kayak adventures, mountain biking and interpretive trails and riverfront leisure, provide reasons for people to come to the river, enjoy its majesty and make sure that it is cared for” (Great River Passage Master Plan, 2013, p. 28). The master plan balances the relationship between “[preserving] and [enhancing] natural areas, and [expanding] access and recreation use in the river corridor.” The plan engages several strategies for balancing this relationship, including limiting new uses to existing and previously impacted areas, expanding recreation uses for all age groups and ability levels, improving riverfront facilities for accessibility, protecting sensitive resources, and expanding recreation without compromising the river’s natural quality. Working with the Nation Park Service, Department of Natural Resources (DNR), the U.S. Environmental Protection Agency (EPA), and other agencies, the master plan also provides environmental education opportunities for people to experience the dynamic ecosystem (Great River Passage Master Plan, 2013, p. 46).

3.4.3 How does this redevelopment project include mixed-use design?

The Great River Passage Master Plan divides the riverfront into four reaches so it can adapt to different constraints and potentials of each area. The four reaches are the Gorge, Valley, Downtown, and Floodplain (figure 3.5).
Figure 3.5: Four reaches in the master plan. (The Great River Passage Master Plan, 2013).

The Gorge reach (figure 3.6) is a deep river valley located west of downtown. It is a great place, which contains “scenic beauty, richness and diversity.” In this area, only a small portion is planned as mixed-use, which explores acquiring part of the existing Ford Plant property. Considering waste, debris, and contamination risks for groundwater and the Mississippi River, a feasible solution is to transfer part of this former industrial parcel to form a mixed-use center with recreational uses. This solution pursues environmental protection, public health, and land use efficiency. Major parts of the Gorge focus on protecting natural and cultural resources, improving nature-cased recreation, and adding access to the river (Great River Passage Master Plan, 2013, p. 94-101).
Figure 3.6: Grey color shows the Gorge reach. (The Great River Passage Master Plan, 2013).

The Valley reach (figure 3.7) is a broad floodplain, featuring “dynamic natural processes and frequent flood events.” Thus, the Valley area is constantly changing and undeveloped. This reach focuses on creating gathering places and enhancing natural areas by redesigning Shepard Road (Great River Passage Master Plan, 2013, p. 102).

Figure 3.7: Grey color shows the Valley reach. (The Great River Passage Master Plan, 2013).

The priority of the Valley reach redevelopment is enhancing the quality of Shepard Road, which has the potential to become a gateway of St. Paul. The Shepard Road redevelopment includes adding mixed-use along trail and river, increasing
transportation alternatives, designing roads through “context-sensitive” strategy, improving park access, enhancing private development, reducing traffic speed, improving trails, developing unified parkway-like landscape design, improving pedestrian and bicycle access from surrounding neighborhoods, and encouraging river-oriented redevelopment. These efforts encourage local residents to enjoy their river, and allow visitors to experience extraordinary views of the Mississippi River when approaching the City. Other redevelopments in the Valley area are Watergate Marina, Crosby Farm Regional Park, Victoria Park and Lower Crosby Farm Regional Park, Lilydale and Cherokee Regional Park, and Island Station (Great River Passage Master Plan, 2013, p. 102-109).

The Downtown reach (figure 3.8) has dynamic urban forms structured by river edges and engineered flood control levees. Small-scale commercial buildings present different urban river edge characters. This area emphasizes creating an urban promenade, which contains a River Balcony and a levee Riverwalk, linking the riverfront to redeveloping neighborhoods (Great River Passage Master Plan, 2013, p. 132).

Figure 3.8: Grey color shows the Downtown reach. (The Great River Passage Master Plan, 2013).
The key of the Downtown reach redevelopment is providing public access on both sides of the river. Each side will have “a distinctly different character that reinforces the identity of each district, and is supported by complementary mixed-use development.” Mixed-use provides more activity, including youth-oriented recreation, leisure attractions, panoramic views, small-scale retail and services, lunchtime and evening entertainment, and other river-oriented recreation services such as boat rentals and equipment sales (Great River Passage Master Plan, 2013, p. 133).

The fourth section of this plan is the Floodplain reach (figure 3.9). This area is mainly occupied by large open spaces of lakes, wetlands, and floodplain forests. Heavy industrial is the main land use in this area. Industrial uses are connected by high-speed highway and heavily used rail lines. The characteristic for this area is defined as “[t]he industrial uses and major transportation infrastructure contrast with the less densely developed and heavily wooded neighborhoods.” Redevelopment for this reach focuses on establishing buffers for natural areas and improving connections to lakes and the river (Great River Passage Master Plan, 2013, p. 150).

Figure 3.9: Grey color shows the Floodplain reach. (The Great River Passage Master Plan, 2013).
Mixed-use development in the Great River Passage Master Plan mainly focuses on the gateway and downtown areas. Mixed-use in this plan provides opportunities for both larger-scale mixed-use centers and small-scale commercial services. These mixed-use efforts prioritize protecting natural features, offering nature-based recreation and developing leisure-commercial uses.

3.4.4 How does this riverfront project protect nature through design?

The Great River Passage Master Plan preserves and enhances natural areas, restores streams, improves urban stormwater quality, and expands nature-based recreation uses along the river. Primary efforts in landscape resource management for this riverfront project include “preventing further degradation of existing resources, managing the existing high quality resources through monitoring and active management aimed at protecting existing ecological function, and applying wise planning to all development activities that might impact resources.” In terms of water resources, efforts include reducing suspended sediments and nutrient loads, restoring historic hydrology for increasing new development feasibility, disconnecting storm sewers wherever possible, encouraging infiltration to replenish ground water flow, improving urban stormwater runoff quality, and improving river shoreline habitat. With regards to preserving and enhancing natural areas, this plan pursues “environmental cleanup and restoration of known brownfield sites on parks property consistent with EPA and DNR requirements. The plan will also complete detailed ecological assessments during final planning and design. While creating new open spaces, green infrastructures are used for establishing natural corridors. In terms of the natural-based recreation, as discussed in 3.4.2, the plan
expands opportunities for naturel-based and river-oriented recreation uses (Great River Passage Master Plan, 2013. p. 36-46).

3.4.5 Summary

The Great River Passage Master Plan adheres to the principles of more natural, more urban, and more connected. This project starts with “gap” analysis so the city, urban planners and designers, stakeholders, and community members can promote the riverfront redevelopment trend. Understanding need changes in supply and demand sides, this plan proposes mixed-use redevelopment for recreation and economic development with prerequisite of river natural protection. The whole plan is divided into four sections so it can adapt to unique characteristics of each reach. Four reach redevelopments respond to the “gaps,” which represents contemporary needs of communities and the city, including more than 30 different kinds of activities.

Lessons learned:

- In terms of site analysis, the Great River Passage Master Plan uses the “gap” identification method to explore natural resources, open spaces, history and cultures, economic redevelopment, and so forth.

- In terms of promoting contemporary recreation trends, this plan combines ideas from the community. Contemporary recreation includes higher quality community centers, natural-based recreation, “third places,” environmental awareness, community gathering places, linear waterfront recreation, public health, compact neighborhoods, off-leash dog parks, and cultural tourism.

- In terms of nature-based recreation development, this plan improves existing park
facilities, prevents human activity impact, increases accessibility to river, and provides recreation for all age groups.

- In terms of park improvement, this plan emphasizes improving existing parks to adapt new needs and environment. Park improvement increases community identity for St. Paul since the city is located in the Mississippi National River and Recreation Area (MNRRA). This also supports more natural activities for people to experience new recreation.

- In terms of site design, planning areas have been divided into four reaches to adapt different constraints and potentials.

- In terms of mixed-use development, mixing functions links St. Paul to the riverfront by “scenic beauty, richness and diversity” (Great River Passage Master plan, 2013, p.94). This mixed-use solution pursues environmental protection, public health, and efficient land use.

- In term of floodplain treatment, this master plan emphasizes one major road to make it a gateway to the city. Designing the road through “context-sensitive” strategies, mixed-use can adapt to “dynamic natural processes” (Great River Passage Master plan, 2013, p.102).

- In terms of downtown waterfront redevelopment, this project encourages small-scale commercial buildings to present different river edge characteristics. Creating an urban promenade for leisure activities links the riverfront to redeveloping neighborhoods.

- In terms of existing industrial site adjustment, redevelopment focuses on establishing buffers for natural areas and improving connections to lakes and the
In terms of riverfront natural feature protection, this plan preserves natural areas, improves stormwater management, and expands nature-based recreation uses along the Mississippi River.

3.5 Case 3: Cincinnati, Ohio

3.5.1 Introduction

Cincinnati’s Central Riverfront Urban Design Master Plan (figure 3.10) operates based on cooperation between Hamilton County, the City of Cincinnati, and public participation. The plan includes two new stadiums and develops an overall urban design framework for the central riverfront (Central Riverfront Urban Design Master Plan, 2000). Planning documents for the central riverfront include the Concept Plan (1997) and the Central Riverfront Urban Design Master Plan (2000). The Concept Plan identified three possible scenarios for stadiums’ locations. The Central Riverfront Urban Design Master Plan proposed the overall site design for selected scenario. This case study explores the latter.
Why the river is so important for this city

Cincinnati’s central riverfront is a huge asset for the city, carrying multi-function, including sports events, mixed-use development, urban parks enhancement, downtown redevelopment, multi-modal transits and parking opportunities, riverfront attractions, and housing (Central Riverfront Urban Design Master Plan, 2000). More important, the city was settled because the river provided reliable transportation for industry and agriculture.

Stakeholders in this riverfront redevelopment project

The Central Riverfront Master Plan began with cooperation between Hamilton County, the City of Cincinnati, and Urban Design Associates in 1996. The plan includes a Riverfront Steering Committee consisting of city and county elected officials, focus
groups, public meetings, a Riverfront Advisors Commission with 16 prominent citizens, a Riverfront Development Commission made up of the City and the County for implementation, and property owners and developers (Central Riverfront Urban Design Master Plan, 2000).

**General goals for this riverfront redevelopment project**

The Central Riverfront Master Plan has three goals. The construction of the two stadiums—the Reds Ballpark and the Bengals Stadium—must be seen as an economic development project which attracts other private investment. The second goal is for the riverfront urban design to reflect history and reconnect downtown to the Ohio River. The third goal is public participation (Central Riverfront Urban Design Master Plan, 2000).

**General organizational strategies for this riverfront redevelopment project**

The Central Riverfront Urban Design Master Plan develops an urban design framework, “which [capitalizes] on the major public investment in the stadiums and structured parking.” The Riverfront Advisors Commission is charged to “recommend mixed usage for the Riverfront that guarantees public investment will create sustainable development on the site most valued by our community.” According to the plan, “The City and County will work with property owners and developers to facilitate commercial office development and parking on the north side of Third Street” (Central Riverfront Urban Design Master Plan, 2000. pp. 2-4).

3.5.2 How did this redevelopment project design for recreation along the river?
For recreation design along the Ohio River, four anchor attractions have been defined, including one existing (Firstar Center) and three new (Paul Brown Stadium, Reds Ballpark, and National Underground Railroad Freedom Center). Another recreational improvement is the establishment of a new 70-acre riverfront park, presenting the signature front door for the City and hosting major festivals.

To reconnect the city to the Ohio River so people can enjoy the riverfront, first, the street grid has been reduced, and connections to the riverfront have been extended (figure 3.11).

Figure 3.11: Major streets, travel directions, transit routes, and intermodal transit center access locations. (The Center Riverfront Urban Design Master Plan, 2000).
Another effort for improving connectivity is the Fort Washington Way reconstruction project. The section in figure 3.12 shows the Fort Washington Way is between Third Street and Second Street. This highway reconstruction improves access to downtown Cincinnati and reconnects the north/south city street network to the riverfront. The reconstruction creates safer traveling experience for both motorists and pedestrians. Designed bridges, landscape decks, and sidewalks accommodate high-quality walking experience from the CBD to the riverfront.

Figure 3.12: North/South site section. (The Center Riverfront Urban Design Master Plan, 2000).

The new Paul Brown Stadium is the home for the Cincinnati Bengals football team. This stadium hosts large sports events, but also provides places for post-game activities, including riverfront restaurants and entertainment. The Cincinnati Reds Ballpark provides fans a public plaza for game time assembly and is also partly open during non-game days. “The seating bowl of the ballpark will be oriented southeast to capture views of the Ohio River and Northern Kentucky. The National Underground
Railroad Freedom Center is a national educational center celebrating history efforts of the underground railroad.

Besides street grid design and stadiums, the Riverfront Park (figure 3.13, 3.14, 3.15) is a significant feature of the central riverfront redevelopment. The new park features great public spaces, large lawn, and “street connections in a variety of settings.” “The riverfront park and new street… connect to the regional trail network and… support and accommodate recreational and commuter cyclists.” The Banks in this plan creates a “24-hour, seven-day-a-week, diverse, pedestrian-friendly urban neighborhood” (Center Riverfront Urban Design Master Plan, 2000, p.52).

Figure 3.13: Aerial view of an early concept for the park. (The Center Riverfront Urban Design Master Plan, 2000).
Figure 3.14: Aerial view of the park. (Google Map, 2014).

Figure 3.15: Street view of Riverfront Park. (UrbanCincy, 2014).
In this master plan, recreation design covers large-scale developments, such as stadiums and their surrounding facilities, Riverfront Park, and small-scale development with attractions and informal recreation along the Ohio River. The key is improving connectivity between the city and its riverfront.

3.5.3 How does this redevelopment project include mixed-use design?

In January 1999, “Hamilton County and the City of Cincinnati… appointed sixteen prominent citizens to the Riverfront Advisors Commission who were charged to ‘recommend mixed usage for the Riverfront that guarantees public investment will create sustainable development on the site most valued by our community.’” Concentrated on the Banks, the mixed-use development, “recommended a diverse, pedestrian-friendly urban neighborhood with a mix of uses, including residential housing, specialty retail stores, restaurants and entertainment, office and boutique hotel spaces.” The final plan defines the Banks as containing 900 to 1,300 housing units; 400,000 to 500,000 sq. ft. of retail and entertainment; and a hotel with 200 to 400 rooms. The Banks carries a 24-hour pedestrian-friendly neighborhood, integrates the central riverfront and Third Street development, enhances connectivity to the CBD with amenity improvements, creates the Boardwalk, creates useable green spaces and amenities, builds county-funded above-ground parking garages for the central riverfront area, collaborates private sectors, and encourages the city/county-joint Riverfront Development Commission (Central Riverfront Urban Design Master Plan, 2000. pp. 12, 60, 35, 54-55).
3.5.4 How does this riverfront project protect nature through design?

The City of Cincinnati has organizations for natural protection ranging from federal level to non-profit organizations. The U.S. Environmental Protection Agency (EPA) defined “the scope for Cincinnati’s EMS [Environmental Management System] following careful consideration of the range of activities undertaken by the Office of Research and Development (ORD) and the Office of Administration and Resources Management (OARM) staff.” Important features in designing Cincinnati’s EMS include identifying activities that have significant impact on the environment, energy consumption, chemical use, water and wastewater infrastructure, vehicle use, and so forth (EPA, 2014). Examples for non-profit organizations include the Cincinnati Parks Foundation, the Cincinnati Nature Center, and the Nature Conservancy, Ohio.

3.5.5 Summary

The Cincinnati Central Riverfront Urban Design Master Plan emphasizes improving connectivity between the downtown and the Ohio River. The stadiums development enhances a sense of belonging through placemaking. Areas surrounding stadiums and central River Park provide daily recreation opportunities by mixing uses. Different organizations protect the river’s natural features. The urban design for the central riverfront overlaps several layers, including streets and highways, parking, commercial, residential, parks and open spaces, and attractions. This plan also covers detailed design guidelines such as urban design and architectural guidelines, streets and parking typologies, and city streetscape standards.
Lessons learned:

- In terms of enhancing community identity, this plan starts with locating sites for stadiums, carrying mixed-use for both sports events and post-game activities.
- In terms of preserving historic features, this design reflects local history, including the development of the National Underground Railroad Freedom Center and connections with river activities.
- In terms of improving connectivity, this plan reconnects downtown to the Ohio River by reconfiguring street grid, extending major streets, and creating massive underground parking systems.
- In terms of improving recreational experience, this plan adds recreation facilities to stadiums. The Riverfront Park provides passive recreation by creating a great lawn and access to the riverfront.
- In terms of mixed-use, the plan creates a 24-hour, pedestrian-friendly, diverse neighborhood.

3.6 Case Study Conclusions

Case studies of the Nashville Riverfront Concept Plan, St. Paul’s Great River Passage Master Plan, and Cincinnati’s Central Riverfront Urban Design Master Plan provide design ideas and redevelopment strategies for Midwest riverfront redevelopment.

Comparing these three riverfront redevelopment plans, Nashville’s has the most aggressive concept, which is the island scheme. The scale of the Cumberland River is
between a recreational river and a working river. This scale supports the riverfront mixed-function, hosting major sports events and different passive recreation choices. This Nashville waterfront plan focuses on redefining culture, enhancing existing recreation, creating different densities for each stream section, and applying mixed-use development at waterfront hot spots.

The Great River Passage Master Plan in St. Paul, Minnesota, has the strongest sense of river natural feature preservation and enhancement since the site is located in the Mississippi National River and Recreation Park Area (MNRRA). The plan starts with “gap” analysis so the design proposal can respond to contemporary needs. The key design feature is the natural-based recreation concept, which balances recreation, environmental protection, and economic development. Similar to Nashville’s plan, St. Paul also divided its river into different sections (reaches) to adapt to different constraints and potentials.

The Central Riverfront Urban Design Master Plan in Cincinnati, Ohio, more emphasizes mixed-use development since the site is located in the downtown. The massive parking system stands out in this plan because the site contains two stadiums, is a transit core, and needs connections to the riverfront. Mixed-use development in this plan creates a 24-hour neighborhood through a variety of mixed functions. The great lawn makes recreation in this riverfront relatively informal and flexible.

**Ideas generated from these three Midwest riverfront redevelopment case studies:**

- Riverfronts provide opportunities for leisure:

  Riverfronts carry functions, including shipping, transportation, settlement, recreation, and so on. Cultural and historical events along riverfronts
enhance communities’ identities through good design. Nashville’s and Cincinnati’s riverfronts focus on providing leisure for sports fans. St. Paul’s riverfront provides natural recreation experiences.

- Riverfront plans include leisure and recreational activities:
  Methodologies for including leisure in riverfront plans include: (1) doing gap analysis for identifying contemporary recreation trends, (2) enhancing sense of belonging, (3) encouraging natural-based recreation, (4) preserving and enhancing existing recreation facilities, (5) dividing riverfronts into different sections for different conditions (particularly large-scale sites), (6) developing mixed-use for diversity, (7) buffering industrial sites, and (8) improving connectivity and accessibility to riverfronts.

- Riverfronts are catalysts for neighborhood revitalization:
  Riverfront redevelopments revitalize neighborhoods by balancing recreation experiences, environmental preservation, and economic development. Riverfront projects create different choices for both active and passive recreation, provide opportunities for natural adventure experiences and education, offer multiple transit options, and develop housing, commercial, and office.
CHAPTER 4: CREATIVE PROJECT DESCRIPTION

Drawing from the literature review and case studies, this chapter explores desired urban design principles and methods for the White River planning area in Muncie, Indiana. The planning program includes recreation and mixed-use strategies. The chapter includes planning context introduction, site analysis, goals and objectives, urban design framework, and detailed design sections.

4.1 Planning Context

In 1923, the Muncie Park Commission proposed a linear park along the White River, connecting McCulloch and West Side parks with a 60-feet-wide boulevard, stretching from Jackson Street to Tillotson Avenue, with new park construction. Many sections of this proposal were implemented through the 1930s, including White River Boulevard, Bunch Boulevard, the Appeal to the Great Spirit, and levee controls along Wheeling Avenue (figures 4.1, 4.2, 4.3, 4.4) (White River Greenway Master Plan, 2000).
From 1924 to 1971, the community mostly ignored the White River, but in 1972, the Bureau of Water Quality was established, making effort to restore the water quality through their internationally recognized industrial waste water pretreatment program. Positive results from the agency’s efforts revived the community’s interest in linear recreational spaces along the river. Recent projects show the city’s on-going interests, including the construction of the Minnetrista Cultural Center campus, several overlooks, the Cardinal Greenway, Tuhey and Riverbend Parks, the historic reconstruction of the...
Washington and Broadway Street bridges, increased usage of West Side Park, and the development of the Ontario Systems Corporation campus (White River Greenway Master Plan, 2000).

In 1995, the White River Corridor Development Committee was founded, composed of citizens, community leaders and government officials. “The Committee’s mission is to extend the educational, recreational and ecological benefits of the White River Greenway’s natural and cultural context to the community at-large” (White River Greenway Master Plan, 2000).

The City of Muncie and the Committee have expended and allocated $9.2 million from public and private sectors for projects adjacent to the White River Greenway, including resurfacing White River and Minnetrista Boulevards, developing Riverbend Park, constructing Cardinal Greenway/White River Greenway Combined trailhead, reconstructing the riverbank along the Minnetrista Cultural Center and Muncie Central High School floodplain, and constructing of the Wheeling Avenue Promenade and High Street Bridge (White River Greenway Master Plan, 2000).

In 2000, the White River Greenway Master Plan was prepared for the White River Corridor Trail Development Design and Steering Committee, affirming a commitment to developing the corridor into a positive educational and recreational facility which preserves and enhances natural environment, developing links to parks and cultural sites, protecting natural resources, providing safe access, and creating strategies assuring quality and continuity of design along the corridor (White River Greenway Master Plan, 2000).
4.2 Site Analysis

4.2.1 Scope

The 1.87-square-mile planning area is along the White River in the City of Muncie, Indiana, bordered by Centennial Avenue, Gavin Street, Jackson Street, Reserve Street, Riverside Avenue, and Linden Street (figure 4.5). River inside the site is roughly 2.76 miles and 400 acres. This project explores the site in three scales. In figure 4.6, “context” scale stands for the community planning context. “River corridor wide” stands for the riverfront scale. “Two gaps” stands for opportunity sites in this plan.

Figure 4.5: Maps showing the site context through state and county scales. (Delaware County GIS Department, 2014, edited by Author).
Figure 4.6: Maps showing the site context in the city scale. (Delaware County GIS Department, 2014, edited by Author).

4.2.2 Demographics

The following demographic analysis identifies basic information about the market/consumers in this site. The analysis covers three levels: site, county, and state. Main questions discussed include who lives here, what they do, and what the market is like.

Who lives here

Statistics in figure 4.7 show the percentage of 20 to 24-year-olds is the highest age group, which indicates this is a relatively young neighborhood. The median age is
27.6 years (2013), which is significantly younger than the state’s median age of 37.4 years (figure 4.8). In terms of race, white is the majority with 68.8%, and African Americans represent 25.2% (figure 4.9). State’s African Americans are 6.7% (Esri Community Analyst, 2014).

![Population Pyramid (the site, 2013)](image)

Figure 4.7: Population Pyramid showing age distribution. (Esri Community Analyst, 2014, edited by Author).

![Median Age (2013)](image)

Figure 4.8: Median age comparison. (Esri Community Analyst, 2014, edited by Author).

![Race Distribution (the site, 2013)](image)

Figure 4.9: Race Distribution. (Esri Community Analyst, 2014, edited by Author, 2014).
What they do

Figure 4.10 indicates people in this site are mainly employed in the service industry (59%), including professional, scientific, management, administrative, waste management, education, health, social, arts, entertainment, recreation, accommodation, food services, and other services. Most residents hold at least high school degree (89%) (figure 4.11). The dominant Civilian employed occupation is mainly White Collar workers (52%) (figure 4.12), including management/business/financial, professional, sales, and administrative support. Blue Collar workers (20.9%) include farming/fishing/forestry, construction/extraction, installation/maintenance/repair, production, and transportation/material moving (Esri Community Analyst, 2014).

Employed Population 16+ by Industry (the site, 2013)
Figure 4.10: Employed population by industry. (Esri Community Analyst, 2014, edited by Author).

Figure 4.11: Education attainment. (Esri Community Analyst, 2014, edited by Author).

Figure 4.12: Employed population by occupation. (Esri Community Analyst, 2014, edited by Author, 2014).
What the market is like

Residents in the chosen site have expenditures mainly for housing needs (figure 4.13), covering shelter, utilities, fuel, and public services. Additional expenditures are on entertainment, recreation fees, and admissions (figure 4.14). Figure 4.15 shows Services occupy a major portion of business (number of Services: 1,367; 46%). The total numbers of vacant housing units are 625, representing 26.6% of total housing units in 2013. State vacant housing rate is 11.5% in 2013. Vacancy distribution is shown in figure 4.16. Vacant housing is classified as seven categories, including for rent, rented-not occupied, for sale only, sold-not occupied, seasonal/recreation/occasional use, for migrant works, and other vacant (there currently is no housing for migrant workers in the site). The average household income in the planning area is $32,709.

Figure 4.13: Household budget expenditures. (Esri Community Analyst, 2014, edited by Author).
Figure 4.14: Recreation expenditures. (Esri Community Analyst, 2014, edited by Author).

Figure 4.15: Numbers of businesses and employees. (Esri Community Analyst, 2014, edited by Author).
Figure 4.16: Vacant housing units by status. (Esri Community Analyst, 2014, edited by Author).

Figure 4.17: Household by income. (Esri Community Analyst, 2014, edited by Author).
Summary of Demographics

The planning site covers 1.87 square miles of land, including 0.63 of water surface. Demographic study compares information from site, county, and state levels, emphasizing who lives here, what they do, and what the market is like. It is a young neighborhood with daily expenditures mainly for entertainment. This area has a high residential vacancy rate, and the average household income is below state average.

Important demographic information comparison is shown in figure 4.18:

<table>
<thead>
<tr>
<th>Census 2013</th>
<th>Site</th>
<th>Delaware County</th>
<th>Indiana</th>
</tr>
</thead>
<tbody>
<tr>
<td>Square Miles</td>
<td>1.87</td>
<td>393</td>
<td>35,826</td>
</tr>
<tr>
<td>Total Population</td>
<td>4,698</td>
<td>116,816</td>
<td>6,554,636</td>
</tr>
<tr>
<td>Population Density</td>
<td>2512.3</td>
<td>297</td>
<td>183</td>
</tr>
<tr>
<td>Median Age</td>
<td>27.6</td>
<td>35.2</td>
<td>37.4</td>
</tr>
<tr>
<td>Median Household Income</td>
<td>$32,709</td>
<td>$37,136</td>
<td>$46,401</td>
</tr>
<tr>
<td>Median Home Value</td>
<td>$74,779</td>
<td>$109,655</td>
<td>$123,935</td>
</tr>
<tr>
<td>Total Households</td>
<td>1,900</td>
<td>46,316</td>
<td>2,533,146</td>
</tr>
<tr>
<td>Total Housing Units</td>
<td>2,738</td>
<td>52,363</td>
<td>2,828,441</td>
</tr>
<tr>
<td>Average Household Size</td>
<td>2.25</td>
<td>2.33</td>
<td>2.51</td>
</tr>
<tr>
<td>Vacant Housing Units</td>
<td>625</td>
<td>6,022</td>
<td>294,158</td>
</tr>
</tbody>
</table>

Figure 4.18: Demographic summary. (Esri Community Analyst, 2014, edited by Author).

4.2.3 Daily Activities

The White River riverfront urban design proposal reflects target residents’ daily activities and their desired lifestyle. The “Lifestyle-Esri Tapestry Segmentation” concept “[categorizes] US neighborhoods into 65 market segments based on socioeconomic and demographic factors, then consolidates them into LifeMode and Urbanization Groups” (Esri, 2014). The Tapestry Segmentation map in figure 4.19 shows several daily activity districts in the planning site.
Figure 4.19. Tapestry Segmentation map showing different “LifeModes.” (Esri, 2014, edited by author).

Esri Tapestry segmentation contains different types of “LifeMode Summary Groups,” which are coded as “L1” to “L12” and “Unclassified” (for categories, see figure 4.19). Each LifeMode Summary Group has been classified into several segments. Daily activity analysis is discussed at the “segment” level.

The Tapestry Segmentation map (figure 4.19) shows 7 LifeMode Summary Groups, each containing one segment. In other words, the planning site consists of 7 kinds of segments.

Segment #1 L6 Scholars and Patriots-Segment 63 “Dorms to Diplomas”: Most residents in this segment are current Ball State University students, and three-fourths are employed by part-time jobs. They have a carefree lifestyle and focus on education.
Residents of “Dorms and Diplomas” prefer convenient prepared and frozen foods. Daily activities include college sports, walking, jogging, working out at on-campus gyms, football, basketball, volleyball, and yoga. In terms of home life, they prefer watching sports and playing cards. They also do shopping in branded clothing stores such as American Eagle and Old Navy (Segment 63, Tapestry Segmentation, 2014).

Segment #2 L7 High Hopes-Segment 48 “Great Expectation”: Residents in this segment are young singles who live alone and married-couple families. The median age is 33.3 years. They are just beginning their careers, including manufacturing, retail, and service industry sectors. Occupancy type is divided as half owned and half rental. Residents in “Great Expectation” enjoy a young and active lifestyle, such as going out for dinner, watching movies, playing Frisbees, playing football, swimming, canoeing, and enjoying music and sports on the radio. In terms of shopping, they do grocery shopping at Wal-Mart Supercenters, Aldi, and Shop ‘n Save; eat at Arby’s and Dairy Queen; and shop at major discount and department stores. They rarely travel (Segment 63, Tapestry Segmentation, 2014).

Segment #3 L3 Metropolis-Segment 51 “Metro City Edge”: Residents in this segment are married couples, single parents, and multigenerational families. The median age is 29.4 years. Over half of residents live in single-family homes. They tend to shop at Marsh and Aldi but not wholesalers or superstores. They eat at fast-food and family-style restaurants such as Old Country Buffet or Ryan’s. Their daily activities include watching movies and professional football games, and watching sports such as pro wrestling on TV (Segment 63, Tapestry Segmentation, 2014).
Segment #4 L8 Global Roots-Segment 60 “City Dimensions”: This segment contains mixed household types and ethnicities. Residents are young with the average age of 29 years. Jobs are primarily in the service, manufacturing, and retail trade industry sectors. This segment has mixed housing types, with 70% of units built before 1960. Most households own a vehicle. Average commuting time for work is 22 minutes. “City Dimensions” residents watch TV a lot, especially sports. They are the top market for sports team clothes. Daily transportation mainly relies on vehicles, and they service their own cars. Residents in this segment also go out for movies and dinner (Esri Tapestry Segmentation, 2014).

Segment #5 L10 Traditional Living-Segment 34 “Family Foundations”: This segment contains mixed family types, including married couples, single parents, grandparents, and young and adult children. Workers in this neighborhood start to retire, and over 20% work for the government. This area has been classified as “small urban communities are located in large metropolitan areas.” Activities include attending church, serving on church boards, helping fundraising projects, and participating in civic activities. Residents in this area eat at home, and shop at discount stores such as Marshall’s and T.J. Maxx. They always watch TV. Basketball is popular in this community (Esri Tapestry Segmentation, 2014).

Segment #6 L5 Senior Style-Segment 57 “Simple Living”: Residents in this segment have an average age of 41.3 years, which is older than the U.S. median age. Nearly 40% of households collect Social Security benefits. Jobs cover areas of health care, retail trade, manufacturing, educational services, and food services. Neighborhoods are located in the urban outskirts and suburbs, and 62% of houses were built before 1970.
Only 20% of households do not have a car. Average commute time to work is 20 minutes. Daily activities in this segment depend on age. Younger residents prefer nightclubs and playing musical instruments; seniors usually go fishing. For this area, TV is highly required, especially daytime TV (Esri Tapestry Segmentation, 2014).

Segment #7 L11 Factories and Farms-Segment 53 “Home Town”: This segment contains married-couple families, singles, and single-parent families. Many families have two generations. Education attainment is lower than the U.S. average. This neighborhood is occupied by low-density housing. New development is inadequate. “Home Town residents savor their quasi-country lifestyle by spending time outdoors fishing and playing football.” They do grocery shopping at Marsh, Aldi, and Wal-Mart Supercenters, and buy clothes at small local malls. They prefer fast food or restaurants such as Bob Evans (Esri Tapestry Segmentation, 2014).

In conclusion, daily activities along the White River in the selected site are distributed by age, household types, income, home locations, and other related factors. As shown on the pie chart in figure 4.20, Dorms to Diplomas, Great Expectations, City Dimensions, Family Foundations, and Simple Living have similar percentages in this planning site, which indicates the major consumer types along the river include college students, young singles, married couples, mixed ethnicity, single parents, and seniors. Desired active recreation includes college sports, working out at on-campus gyms, football, basketball, volleyball, yoga, swimming, and canoeing. Preferred passive recreation includes fishing, walking, jogging, throwing Frisbees, and so on. Other daily activities they enjoy include watching TV and playing cards at home, and going out for dinner and movies. Activities along the White River should adapt to different groups,
replying to different demands. Inducement and opportunities such as healthier food and more connection to greenways engage people to the river and optimize lifestyle.

Figure 4.20: Tapestry Segmentation distribution. (Esri Tapestry Segmentation, 2014, edited by Author).

4.2.4 Existing Land Uses

Existing land uses include agricultural, commercial, residential, multi-family residential, industrial, public owned, exempt, and vacant use. Agricultural use includes working farms and vacant agricultural land. Commercial use includes retail, auto service, commercial parking, and so on. Residential Use includes single-family dwelling, duplex, house trailer, and so on. Multi-family residential includes apartments. Industrial use includes light manufacturing and assembly, industrial warehouse, heavy industrial, and so on. Public-owned land belongs to municipality, county, township, state, board of education, and other entities. Exempt use includes charitable organizations, such as
churches/public worship, and cemetery/monuments. Vacant lands in this site are mainly residential vacancy, occupying approximately 155 acres, 26.6% of total residential area (figure 4.21). Major land uses along the White River include residential use and public-owned land. The vacancy rate of the planning site is about 12%. The Tax Increment Financing District (TIF District) is mainly located in the downtown area, covering 115 acres and 8.8% of land. Park use occupies 14% of land (figure 4.22).

Figure 4.21: Existing land use map. (Delaware County GIS Department, 2014, edited by Author).
Existing land uses indicate the White River waterfront has development potential based on high percentage of public-owned land and high vacancy rates in residential areas. A TIF District gives opportunity to reconnect downtown to the river while also developing mixed-use.

### 4.2.5 Floodplain

The floodplain map in figure 4.23 shows flood hazard areas, green spaces, and brownfield locations within the 10-foot contours. Flood hazard areas in this site have been divided into four categories: A, AE, 0.2-percent-annual-chance floodplain, and X. According to the Federal Emergency Management Agency (FEMA), “A” and “AE” both mean “[a]reas subject to inundation by the 1-percent-annual-chance flood event.” The
only difference is “A” does not show the Base Flood Elevation (BFEs) or flood depth. “0.2-percent-annual-chance floodplain” means there is 0.2% flood possibility each year. “X” stands for areas that are in the 0.2-percent-annual-chance floodplain, but outside the 1-percent-annual-chance and 2-percent-annual-chance flood event. Areas in X are always protected by levees. Thus, A and AE have relatively higher risk than 0.2-percent-annual-chance floodplain and X (FEMA, 2014).

Figure 4.23: Floodplain. (Delaware County GIS Department, 2014, edited by Author).

Figure 4.23 indicates lands along the White River are mainly located in the 0.2-percent-annual-chance flood zone, demonstrating that redevelopment in these areas can be achieved with flood control. Areas in A and AE (1-percent-annual-chance floodplain) are already covered by green spaces, which can be redeveloped for recreational use. This map also identifies four brownfield locations in the planning area.
4.2.6 Parks and Recreation

The Parks and Recreation map in figure 4.24 identifies four city parks (Tuhey, McCulloch, White River, and Riverview) and several smaller neighborhood parks, two schools, one cultural center, two recreation trails, one culture trail, and bike lanes. Donated by George McCulloch in 1892, McCulloch Park covers 118 acres of land, and is the biggest community park in Muncie, and accessible to the whole community. It has integral amenities, such as a playground, a baseball field, a soap box derby track, basketball courts, Frisbee Golf, picnic benches, picnic shelters, picnic tables, BBQ grills, park lodge rental facility, restrooms, and fishing/boating (City of Muncie, 2014). The two schools are Muncie Central High School and Washington Carver Elementary School. Another attraction along the White River, Minnetrista Cultural Center is “a gathering place by the water,” carrying the Ball Family Legacy, heritage collection, gardens, and natural areas (Minnetrista, 2014). Trails include White River Greenway, Cardinal Greenway, and Art & Culture Trail. White River Greenway and Cardinal Greenway intersect at the trailhead on McCulloch Boulevard, located south of McCulloch Park, facing the waterfront. Parallel to Cardinal Greenway, a non-functional railroad bridge crosses the river, retaining a piece of engineering architecture in the landscape. Other existing assets along the White River include several overlook spots, dams, Oakhurst Gardens, downtown Muncie, and John Craddock Wetland Nature Preserve (Delaware County GIS Department, 2014).
Figure 4.24: Existing parks and recreation map. (Delaware County GIS Department, 2014, edited by Author).

4.2.7 Transportation System

This existing transportation system study (figures 4.25 and 4.26) evaluates connectivity in terms of vehicular system and bicycle/pedestrian access. The existing vehicular system map identifies motor vehicle roads to the river, parking lots, and transit stops. Most streets terminate before they reach the river. Bridges are the waterfront access for vehicles. Another reason for low vehicle accessibility is the shortage of parking spaces along the riverfront. Transit stops (MITS Bus shelters) concentrate in downtown. Only two bus stops are close to the White River in the planning area. Thus,
the site should increase connection by extending streets to the river, adding parking, and improving transit access.

Figure 4.25: Existing vehicular system map. (Delaware County GIS Department, 2014, edited by Author).

The Existing Bicycle/Pedestrian map (figure 4.26) identifies two recreation trails, one art and culture trail, a bike system, transit stops, and sidewalk conditions. These three trails are important assets for the White River waterfront redevelopment. Trails improve connections from riverfront to downtown, link parks along the river, and present local culture in linear spaces. The bike system has an integrated north/south network across the river. The City of Muncie is planning to develop more west/east connections so the bike system can operate with three trails. Sidewalks are classified into four conditions: excellent, good, fair, and poor. The map in figure 4.26 indicates most sidewalks
connecting to the river are in poor condition. Some neighborhoods do not have sidewalks. This becomes an obstacle for people who want to enjoy the river.

The White River redevelopment needs more connections for both vehicular and bicycle/pedestrian dimensions. Existing transportation conditions reduce physical and visual connections.

Figure 4.26: Existing bicycle/pedestrian map. (Delaware County GIS Department, 2014, edited by Author, 2014).

4.2.8 Site Analysis Conclusion

Studies of demographics, daily activities, existing land uses, floodplains, existing transportation systems, and recreation facilities identify five opportunity sites along the
White River for future redevelopment (figure 4.27). Criteria for estimating an opportunity site consider four aspects: land use, floodplain, transportation, and park/recreation system.

In terms of land use, vacant land, brownfield, public-owned, or location close to downtown gives a site opportunities for further redevelopment. Vacant land or brownfield contains land that can be developed without demolishing structures. Public-owned land attracts private investment since the land can be cleaned up by the city, and reduces costs for purchasing land from private owners. Sites near downtown are easier to activate since downtown Muncie contains several eating and shopping venues. In terms of the floodplain, sites in floodplain are less flexible to develop. However, these locations can still be used as greenway. Transportation systems are the spine connecting every feature along the river. Both vehicular and bicycle/pedestrian systems are considered in choosing potential redevelopment locations along the river. The vehicular system contains important features, including parking, connections to the river, and transit. The bicycle/pedestrian system includes existing and potential bike lanes, and sidewalk conditions. In terms of park and recreation systems, parks, trails, and cultural spots are considered. The planning area includes four city parks, three trails, and several cultural spots, providing open, linear, and point spaces, linking natural and manmade features along the river. Sites with existing recreation facilities have opportunities to become centerpieces for the community.

These five areas identified by previous site analysis as opportunity sites for redeveloping the White River: Tuhey Park area, Wheeling Avenue/White River area, Minnetrista area, McCulloch Park area, and White River Park area (figure 4.27).
Figure 4.27: Opportunity sites map. (Delaware County GIS Department, 2014, edited by Author).
Tuhey Park (figure 4.28)

This area is in a TIF district, mostly public-owned, and outside the flood zone. Two bridges and one bus stop increase connectivity to the river and downtown. White River Greenway and the Art & Culture Trail intersect here. Tuhey Park area has opportunity to be the Gateway of the planning site, welcoming visitors and showcasing community identities.

Figure 4.28: Tuhey Park Pool. (Tuhey Pool, 2014).

Wheeling Avenue/White River

The Wheeling Avenue/White River area (figure 4.29) contains public-owned land, mainly occupied by commercial and residential uses, close to Muncie Central High School, and outside the flood zone. One bus stop, good sidewalk conditions, and future
bicycle lanes enhance accessibility to the riverfront. This area is close to Minnetrista Cultural Center and the trailhead.

Figure 4.29: Wheeling Avenue/White River. (Google Map, 2014).

Minnetrista

The Minnetrista area (figure 4.30) also has significant redevelopment potential and has chance to become a centerpiece of the community. The area contains commercial, residential, and industrial uses. It faces downtown, is outside the floodplain, and is the location of the trailhead, which is shared by three trails: White River Greenway, Cardinal Greenway, and the Art & Culture Trail. Attractions inside this area include Minnetrista Cultural Center, cultural locations, the trailhead, landscape bridge structure, and adjacent McCulloch Park, and a baseball field.
McCulloch Park

The McCulloch Park area (figure 4.31) is mostly public-owned. It is close to Washington Carver Elementary School, Minnetrista Cultural Center, the trailhead, and one bus stop. White River Greenway and Cardinal Greenway go through this area.
The White River Park

The White River Park area (figure 4.32) is mainly occupied by residential use and partly public-owned. This area and McCulloch Park are both in the flood zone. The White River Park area contains two parks and is crossed by two trails.
Constraints: Existing parks need better connections to the riverfront. McCulloch Park has a good location. However, lack of connectivity and landscape design becomes obstacles for making a gathering place to reach the waterfront. Connections between the river and neighborhoods need improvements in term of sidewalk qualities and street networks. For example, McCulloch Park area contains assets such as the trailhead, two greenways, and bike lanes. The existing rail road at west of McCulloch Park also limits connections between neighborhoods and the park. Connectivity is easy to be built by improving sidewalk qualities in surrounding neighborhoods and extending several streets to the river. Several sections along the river also need visual connection improvement. Neighborhoods along McCulloch Boulevard have poor views to the river due to the elevation and vegetation.
4.3 Goals and Objectives

The goal of this project is to redevelop the White River corridor, rediscover potential waterfront recreation, and redevelop riverside neighborhoods. The White River riverfront proposal addresses three objectives (figure 4.33):

- Create a Green-river Network for more connections between neighborhoods, river, and trails.
- Improve waterfront recreation to accommodate different interests.
- Redevelop neighborhoods along the river for housing and leisure needs.

4.4 Urban Design Framework

Figure 4.33: Framework.
This section explores a concept plan at the river corridor scale, including three objectives and several strategies. This White River corridor concept plan explores the White River redevelopment by emphasizing five crucial locations: Tuhey Park, Minnetrista Cultural Center, McCulloch Overlook Neighborhood, McCulloch Park River Recreation, and Riverview Landing (figure 4.34). These five locations are keys for achieving three objectives, which are implemented by several strategies.

Figure 4.34: Five key locations. (Delaware County GIS Department, 2014, edited by Author).
Strategies for creating a Green-river Network:

1. Rebranding existing parks

   A green-river network contains three layers: place, connection, and activity. Place means place-making, focusing on rebranding existing parks. This plan emphasizes five important function districts (figure 4.35), each taking advantages of these community assets, using them as centerpieces for redeveloping recreation and neighborhoods.

   Connection focuses on vehicular/pedestrian systems, access points, and gateways.

   Activity appeals to local culture, art, and community events which identity community’s characteristics.

   The planning area along the White River contains three important parks. Operating with existing recreation trails, these parks are leisure assets for the community, yet underutilized and losing attention from the community. People hardly know how to get to these parks and enjoy leisure time there. Filling these gaps with new functions and context-sensitive design (St. Paul, 2013, p. 69) along the river provides opportunities for further recreation and neighborhood redevelopment.

   Five function districts serve and promote the community in different ways (figure 4.35). Existing land uses in Tuhey Park area include single-family and multi-family residential, commercial, and a few vacant lots. Houses near the riverfront have better condition. Commercial uses contain big parking lots near the river. People can hardly reach the river because impervious paving and a cluster of straggly trees. Residents in this area are mainly college students with a median age of 21.7 years, and 42% of residents have roommates, and 38% live in single-family houses. Demand for off-campus rental housing is high. Daily activities are youth-oriented active and passive recreation
Improving the supply of healthy local food will attract college students and provide them healthier lifestyles. Therefore, Tuhey Park area has opportunities to become a young neighborhood with a high-quality park, well-connected riverfront, residential use, and a gateway with local retail.

From Tuhey Park to the upstream, Minnetrista Cultural Center is an important cultural asset for the community. This area is well designed and connected by the White River Greenway and bike lanes. Neighborhoods near this cultural center contain large, high-quality houses along the river. The city already has plans for future on-street bike lanes which will connect to the White River Greenway. However, neighborhoods have weak views to the river even within walking distance. Clusters of straggly trees and steep slope make it hard to enjoy the river’s scenic beauty. This is an opportunity to create riverfront overlooks and fishing spots for non-structured recreation. Residents in this area are young singles and married couples with median age of 33.3 years. House occupancies are half owner-occupied and half rented. People prefer young and active lifestyles. They need decent restaurants and bars for entertaining and socializing. Therefore, Minnetrista Cultural Center area has opportunities to provide culture and art exhibits, riverfront overlooks, fishing, and other non-structured recreation.

McCulloch Overlook Neighborhood contains commercial use and a brownfield. In this concept plan, this area is proposed as mixed-use neighborhood redevelopment with riverfront recreation, recreational trailhead, and park recreation. People in this district are also young singles and married couples. Affordable housing with activity facilities, healthy food, and outdoor recreation spaces are highly demanded. A trailhead, three recreation trails, a large urban park (McCulloch Park), a baseball field, current
vacant land, and beautiful river view make up an ideal place that accommodates affordable, leisure, and fresh lifestyles.

McCulloch Park River Recreation is one of five function districts that provide gathering places for daily leisure and events. This area is in the 100-year flood zone, so planning for this district mainly focuses on recreation development. The method for rejuvenating this large urban park is to create an internal recreation trail system instead of the existing wide concrete road. An Internal trail system will help McCulloch Park interact with the White River Greenway. The baseball field is at the southwest corner of the park and close to the river. The plan should include temporary facilities for after-game recreation along the rivers such as food carts and ice cream stands. McCulloch Park River Recreation also has ability to accommodate other recreation activities, such as skateboard park, seating, and other facilities for all ages. With contemporary functions, McCulloch Park can adapt to new community needs.

The fifth function district is the Riverview Landing, mostly covered by 50-year and 100-year flood zones. The plan for this area focuses on protecting riparian zone, creating canoe and kayak launches, developing passive recreation with nature protection process, and establishing gathering places, overlooks, and gateway. Area outside the flood zone should focus on housing development because of the high vacancy rate. Development can focus on important existing housing stock and diversify typologies. People in this district have higher age than previous four districts. Rediscovering leisure recreation is necessary for substituting indoor activities such as watching TV.
Figure 4.35: Function Districts.
2. Improving connections to the river

Improvements to connections for pedestrians, bicyclists, and motorists should (figure 4.36):

- Extend streets to improve neighborhood vehicle and pedestrian connections to the waterfront and recreation trails.
- Create continuous vehicular and pedestrian access to the river and parks, improving signage and wayfinding systems for park and river access, defining gateways, and adding canoe/kayak landings.
- Repair sidewalks and improve their aesthetic qualities, including enhancing streetscape and landscape, adding street lights, and improving paving.
- Provide bicycle parking stations at the trailhead and MITS bus shelters, create an internal trail system in McCulloch Park for improving walk and bicycle connections to existing recreation trails, add soft trails and floating walkways which have low impact on the natural environment, and apply other context-sensitive design features.
- Avoid endless linear space along the White River, add overlooks as nodes for the river corridor to keep different open space typologies and identify waterfront access.
Figure 4.36: Connections.
Graphics in figures 4.37-4.40 show several important accesses to the river.
Figure 4.39: Section C-C, McCulloch Park access.

Figure 4.40: Section D-D: Canoe and kayak access at the Riverview Landing.
3. Enhancing community identities

   Enhancing community identities includes highlighting art and culture facilities along the river corridor, exploring places for daily and annual events such as sports games and farmers market (figure 4.41).
Figure 4.41: Art and culture. (Delaware County GIS, 2014, edited by Author).
Figure 4.42 illustrates strategies as:

1. Increase gathering places and protect nature at the same time.

2. Add contemporary riverfront leisure activities corresponding to community daily activities.

3. Create education-oriented recreation, including building a laboratory such as Natural Resources and Environmental Management (NREM) for Ball State University students and improving signage interpretation systems.
Figure 4.42: Planned Recreation. (Delaware County GIS, 2014, edited by author).
Figure 4.43 shows three strategies for riverside neighborhood redevelopment:

1. Develop mixed-use with third places for neighborhoods which are located in low flood risk zone.

2. Leverage potential infill housing outside the flood zone.

3. Increase supply of healthy local food by encouraging urban agriculture.

Figure 4.43: Potential redevelopment sites. (Delaware County GIS, 2014, edited by Author).

### 4.5 Detailed Design

This section focuses on redesigning two urban development opportunity sites at neighborhood scale: the McCulloch Overlook Neighborhood and Riverview Landing.
The McCulloch Overlook Neighborhood redevelops an existing brownfield. The goal is to transform the currently underutilized vacant land into a mixed-use neighborhood, providing desirable residences, riverfront recreation, and third places. The Riverview Landing reuses the land located in greater flood risk zones as gathering places for the community. Plans for this site leverage the existing riparian protection zone, the well-designed riverside landscape, and the John Craddock Wetland Nature Preserve to create a gateway, accommodating riverfront passive recreation, canoe/kayak launches, formalized park access, infill housing, plus laboratory and signage interpretation systems for educational purposes (figure 4.44).

Figure 4.44: Planned land use for the McCulloch Overlook Neighborhood and Riverview Landing.
The detailed designs address networking issues concerning connections between these opportunity sites. The McCulloch Overlook Neighborhood and Riverview Landing feature integrated community functions. Better connections between neighborhoods, riverfront, and existing and planned recreation attractions help these significant locations interact with the whole White River network and improve connections to jobs. Several important streets are highlighted to become major connections that enhance connectivity between neighborhoods, river, and recreation assets. From west to east, Highland Street connects Minnetrista Cultural Center, the McCulloch Overlook Neighborhood, McCulloch Park, and the Whiteley Neighborhood. This street has opportunity to become a boulevard that accommodates daily walking, bicycling, and jogging. Supplementing existing trails along the river, Highland Street will enhance connectivity between neighborhoods, trails, and the river. From north to south, Dr. Martin Luther King Jr. Boulevard and Macedonia Avenue are two ideal streets to make connections between the Whiteley Neighborhood and the riverfront. The intersection of Bunch Boulevard and Macedonia Avenue has already been redesigned to provide a safer access to the White River (figure 4.45).
Figure 4.45: Site concept plan for the McCulloch Overlook Neighborhood and Riverview Landing.
Detailed designs for these two neighborhoods consider how to develop sites to also address how they connect to the larger context. The McCulloch Overlook Neighborhood redevelopment should develop mixed-use, rediscover riverfront recreation, and create third places (figures 4.46, 4.47, 4.48, 4.49).

Figure 4.46: McCulloch Overlook Neighborhood.
Activities connecting this neighborhood to the river include outdoor dining, McCulloch Boulevard, bike lane, sidewalk, and recreation lawn (figure 4.48).
The McCulloch Overlook Neighborhood develops mixed-use, create third places, and provide places for both day and night such as coffee shops, bars, and restaurants (figure 4.49).

Riverview Landing provides passive recreation opportunities with context-sensitive design, canoe landing, and educational uses. This site should provide passive recreation with interpretation systems, develop infill housing, and rebrand the existing White River Park by formalizing access. Connections between these two significant sites, riverfront recreation assets, and trails will start with three important streets: Highland, Dr. Martin Luther King Jr., and Macedonia (figure 4.50, 4.51).
Figure 4.50: Riverview Landing.
Riverview landing’s activities are mainly passive recreation, including a soft trail along the river, seating, a new trail for formalizing park access, and recreation lawn (figure 4.51).

4.6 Summary

This White River waterfront redevelopment project addresses issues from a large river corridor scale concept to smaller neighborhood scale detailed plans. Site analysis informs who lives here, what they do, and what the housing and recreation expenditures market is like. Based on this information, the concept plan proposes a contemporary riverfront development, accommodating a green-river network, housing development,
and riverfront recreation with active and fresh features. This plan highlights five significant sites along the river. Each has different development emphasis based on its unique characteristics. The concept plan explores connections and access to the river, art and culture along the river, plus riverfront recreation opportunities. Detailed design focuses on two important opportunity sites standing out as most ideal locations for riverside recreation development. Plans for these two sites emphasize riverfront recreation and mixed-use development, including housing, third places, education-oriented uses, formalized access to the White River Park, plus waterfront active and passive recreation.
CHAPTER 5: CONCLUSION

5.1 Project Summary

This White River urban design proposal in Muncie, Indiana, explores why and how riverfront reclamation has become a catalyst for neighborhood revitalization through rediscovering riverside recreation while redeveloping neighborhoods. Three important research questions drive this creative project: (1) addressing how important riverfront recreation is for cities, (2) how riverfronts can provide leisure opportunities, and (3) how riverfront planning includes recreational activities.

To answer these questions, literature review explores urban riverfronts’ benefits, waterfront design strategies, and organization strategies, which cover riverside recreation development strategies, river environment protection methods, plus organization strategies from city and developer perspectives. Case studies focus on Midwest riverfront redevelopment, including Nashville, Tennessee, St. Paul, Minnesota, and Cincinnati, Ohio. Each case has unique design features with different scales, locations, functions, cultures, and markets. Several ideas are suitable for the White River waterfront redevelopment, such as gap analysis, celebrating culture, addressing contemporary needs,
context-sensitive design, riverfront neighborhood redevelopment, waterfront education-oriented development, and other riverfront redevelopment practices.

This White River project chooses contexts at river corridor and neighborhood scales. Starting with site analysis, the project explores who lives along the White River, what they do, and what the market is like. Results indicate that the project should focus on riverside recreation development for all ages, especially youths. Active lifestyles, healthy local food, quality housing development, and environment protection are also required during the recreation development process.

After the literature review, case study, and site analysis, this creative project identifies three objectives for the White River development: (1) creating green-river network connections between neighborhoods, river, and trails; (2) improving waterfront recreation to accommodate different interests, and (3) redeveloping neighborhoods along the river. The project addresses issues from larger-scale concept plan and smaller-scale detailed plan. The concept plan explores design strategies for the river corridor by emphasizing five important function districts. Detailed plans focus on two urban development gaps which have important locations and opportunities to become a centerpiece and a gateway for the White River corridor. Plans for these two sites emphasize developing mixed-use, creating third places, providing non-structured passive recreation, creating educational uses, and designing with riparian zone protection.

In conclusion, first, riverfronts are important recreational assets for cities. Carefully planning stimulates waterfront development, providing amenities that make neighborhoods desirable places to live while protecting environment. Second, riverfronts provide opportunities for leisure time away from toils of urban life. Riverside recreation
can promote daily activities and community identities as an active neighborhood. Third, riverfront plans explore leisure and recreational activities in forms of improving connections and adjusting land uses. Waterfront planning enhances views across the river, creates third places to bring people to the water, plus improves auto, bicycle, and pedestrian access to the river.

5.2 Future Research

This White River redevelopment project explores riverfront recreation, requiring water quality improvement, low environmental impact, and implementation strategies. Future research should cover environmental impacts from engineering and management perspectives, addressing issues concerning environmental protection and improvement, especially for riverfront environment. Implementation strategy study should cover interactions between the city, private investments, non-profit participation, and other stakeholders. Regulation and policy-making should be considered during stakeholder participation. Integrated riverfront recreation systems with better environmental quality and feasible implementation strategies are keys for urban riverfront redevelopments.
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