30th Street Industrial Corridor Greenway Corridor Report

MMSD Contract M03062P01/M03062P02

Prepared For:

Milwaukee Metropolitan Sewerage District &

Wisconsin Housing and Economic Development Authority

Final

March 30, 2015

CDM Smith

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List of Abbreviations

BMPs	Best Management Practices
CAC	(30th Street) Corridor Advisory Council
CPTED	Crime Prevention Through Environmental Design
CSO	Combined Sewer Overflow
DCD	Department of City Development
DPW	Department of Public Works
EDA	Economic Development Administration
EPA	Environmental Protection Agency
FBI	Federal Bureau of Investigation
fps	feet per second
GI	Green Infrastructure
HUD	Department of Housing and Urban Development
HVAC	Heating, ventilation, and air conditioning
ISS	Inline Storage System
JIWRF	Jones Island Water Reclamation Facilities
MAWIB	Milwaukee Area Workforce Investment Board
MG	Million Gallons
MIS	Metropolitan Interceptor Sewer
MMSD	Milwaukee Metropolitan Sewerage District
MPS	Milwaukee Public School
MVP	Menomonee Valley Partners
NEEP	Neighborhood Environmental Education Projects
NSC	Near Surface Collector
RISE	Regional Internships in Science and Engineering
ROW	Right-of-way
TBD	To Be Determined
UEC	Urban Ecology Center
USACE	United States Army Corps of Engineers
USDOT	United States Department of Transportation
USEPA	United States Environmental Agency
UW	University of Wisconsin-Extension
WDNR	Wisconsin Department of Natural Resources
WEDC	Wisconsin Economic Development Corporation
WHEDA	Wisconsin Housing and Economic Development Authority
WisDOT	Wisconsin Department of Transportation
WRTP/BIG STEP	Wisconsin Regional Training Partnership/Building Industry Group Skilled Trades Employment Program

Executive Summary

ES.1 Mission/Objective

The 30th Street Greenway Corridor project (Greenway Corridor) will mitigate surface flooding and basement backups, and improve water quality in the 30th Street Industrial Corridor (Corridor). It will also contribute to a broader initiative to revitalize the area, provide a platform for redevelopment and preserve and connect to adjacent neighborhoods. This will be achieved by creating a Greenway Corridor that encourages active living, environmental sustainability, and economic development while linking the Corridor neighborhoods to the metropolitan Milwaukee area and beyond. Although only one of many critical factors necessary for revitalization of the Corridor area, implementation of the Greenway Corridor concept can make a significant contribution to a broader solution that will resolve a number of major environmental, economic, and social issues, and improve the overall quality of life for local area residents and businesses.

ES.2 Corridor Background

The Corridor area is a historic employment center where companies such as Eaton and A.O. Smith once employed thousands of workers. The core of the Corridor area is generally bounded by Hampton Avenue on the north, 27th Street on the east, Wisconsin Avenue on the south, and 35th Street on the west, and encompasses many neighborhoods such as Garden Homes, Franklin Heights, Villard, Miller Valley, Sherman Park, Walnut Hill, Lincoln Creek, Metcalf Park, and Washington Park. The industrial zone currently includes several major employers, including MillerCoors; Harley-Davidson Motor Company; DRS Power and Control Technologies, Inc.; Glenn Rieder; PAK Technologies; United Milwaukee Scrap; Capitol Stampings; and Master Lock. **Figure ES-1** shows the Corridor study area and the locations of these major industries.

Corridor Challenges

The Corridor area faces many challenges on a number of different fronts. On July 22, 2010, approximately 3,000 properties experienced basement backup problems and approximately 50 street locations experienced surface flooding during this storm event. **Figure ES-2** shows the locations of reported basement backups and surface flooding for the July 2010 storm event. The Corridor was especially impacted, suffering more than $32 million in reported damages in the private sector alone.

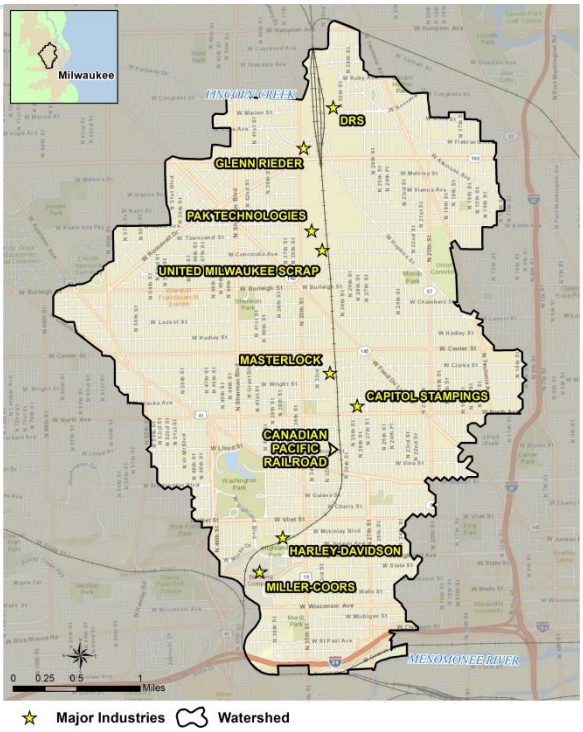


Figure ES–1. Corridor Study Area

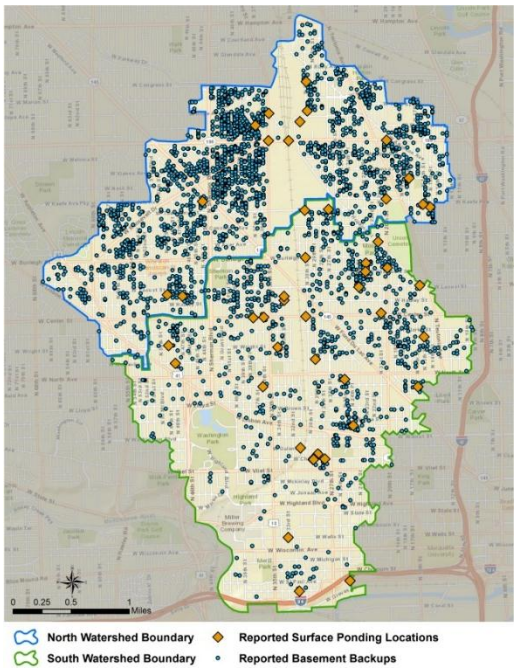


Figure ES–2. July 2010 Storm Event Reported Drainage Problems

Beyond the flooding problems, the Corridor faces significant social, environmental, and economic challenges. Crime rates are high, which contributes to a decline in neighborhood desirability and a disincentive for locating businesses in the area. Historic industrial use has left a legacy of contamination with over 750 acres of brownfields in the Corridor. The collapse of the housing market in 2007 (CBSNEWS, 2012), has contributed to significant degradation in property values with significant properties vacant or in foreclosure.

Corridor Revitalization

The City of Milwaukee (City) is in the midst of an ambitious effort to transform the Corridor into a major modern employment center and economic hub for the City and the region. This effort has included multiple preliminary studies and planning efforts, as well as the purchase of the 84-acre former Tower Automotive Site in the northern part of the Corridor. This site is being redeveloped as a modern industrial park, named Century City, and will serve as a centerpiece for revitalization in the Corridor.

Figure ES–3. Artistic Representation of a Greenway Corridor Vision

The Milwaukee Metropolitan Sewerage District (MMSD) initiated the North Corridor stormwater study in 2012 to analyze the flooding problems in the North Corridor (Corridor area north of Townsend Avenue) and develop recommendations to address flooding problems. In 2013, MMSD and the Wisconsin Housing and Economic Development Authority (WHEDA) extended the stormwater planning to investigate stormwater issues in the South Corridor (Corridor area south of Townsend Avenue) while facilitating economic development efforts, and collaborated to create the vision of a Greenway Corridor. This vision would not only address the drainage problems, but also would serve as a platform for redevelopment and revitalization that could lead to enhanced safety, job creation opportunities, increased property values, recreational enhancements, and neighborhood stability.

ES.3 Stakeholder Involvement

The Greenway Corridor concept was formulated with the input of key stakeholder representatives at important project milestones and decision points to reach consensus on an overall drainage and Greenway Corridor solution for the Corridor area. Seven workshops were held at different locations within the Corridor over a 17-month period. The stakeholder group was comprised of selected organizations to assist in the formulation of an initial Greenway Corridor concept that would set the stage for additional community outreach as the project moves forward.

Figure ES–4. Stakeholder Involvement

One outcome of the stakeholder group interaction was the formation of the 30th Street Corridor Advisory Council (CAC) in 2014, comprised of several stakeholder group participants. The CAC will take the lead to advance the Corridor concept and to serve as the responsible entity for Greenway Corridor implementation and maintenance.

ES.4 Greenway Corridor Solution Development

An iterative process was used to develop the Greenway Corridor concept, which integrates the required drainage system needs with selected greenway characteristics and components to achieve the overall objectives and performance criteria established for the project. First, the required drainage improvements were defined to address area flooding problems. Second, specific non-drainage way components such as urban agriculture, vegetative buffers, and recreational fields were evaluated for inclusion into the Greenway Corridor concept. Finally, the drainage and non-drainage features were integrated to complement one another and form a recommended overall Greenway Corridor solution.

Drainage System Solution Components

The proposed solution to the surface water drainage problems and basement backups requires a set of infrastructure improvements to effectively manage surface water runoff through new stormwater storage and conveyance facilities. The drainage solution is comprised of street inlet restrictors, stormwater storage basins, storm sewer conveyance, the Greenway Corridor drainage way, and associated green infrastructure (GI). **Table ES-1** summarizes the drainage system components of the solution relative to the North and South Corridor.

Table ES-1. Summary of Drainage System Solution Components

Drainage Component	Description
Inlet Restrictors	5,000 street inlet restrictors placed in selected subbasins (South Corridor)
Stormwater Conveyance	7,000 feet of 72- to 144-inch storm sewer from the south end of the drainage way at W. Vliet and N. 27th Street to the Menomonee River (South Corridor) 2,200 feet of 24-inch storm sewer for street flow relief in the W. Center Street and N. 32nd Street area (South Corridor) 1,500 feet of 5.5- x 8.5-foot box culvert from the intersection of N. 35th Street and W. Capitol Drive to the Bee Bus Storage basin near Lincoln Creek (North Corridor) 1,200 feet of 5- x 8-foot box culvert from N. 27th Street and W. Hope Avenue to the DRS East Basin (North Corridor) 965 feet of 4- x 6-foot box culvert connecting the East Basin to the North Basin (North Corridor)
Stormwater Storage	52.2 million gallons (MG) of stormwater storage at nine locations in South and North Corridors
Drainage Way	13,500 feet (or 2.6 miles) of drainage way from W. Auer Avenue to W. Vliet Street (South Corridor) including roadway crossings at 20 locations

Integrated with this drainage infrastructure, a greenway concept provides the opportunity for many additional benefits and opportunities beyond simple drainage improvements and flood damage reductions. It can provide a wide range of additional features to complement the adjacent neighborhoods, provide specific elements to strengthen the social fabric of the area, and greatly enhance the value of that portion of the Corridor area. This can be accomplished through four fundamental components:

- A drainage channel
- A landscaped strip of land
- A continuous path or trail for recreational and transportation use
- A continuous vertical marking of the Greenway Corridor with vegetation

Greenway Corridor Features and Elements

Specific features and elements were added to these fundamental components based on the preliminary opportunities and needs of individual blocks or segments of the Greenway Corridor. A number of elements were considered to be incorporated with the drainage way within the Greenway Corridor, including bike paths, vegetated buffers, GI best management practices (BMP), urban agriculture, etc. These elements, combined with drainage requirements and preferences of the Stakeholder Group, form the preliminary Greenway Corridor concept to provide environmental, economic, and social benefits to the entire Corridor area. **Figure ES-5** shows a conceptual cross section view of one segment of the Greenway Corridor along W. Clark Street from N. 30th Street to N. 27th Street. This segment contains the Greenway Corridor drainage way, urban agriculture, a bike path, and vegetated buffer elements.

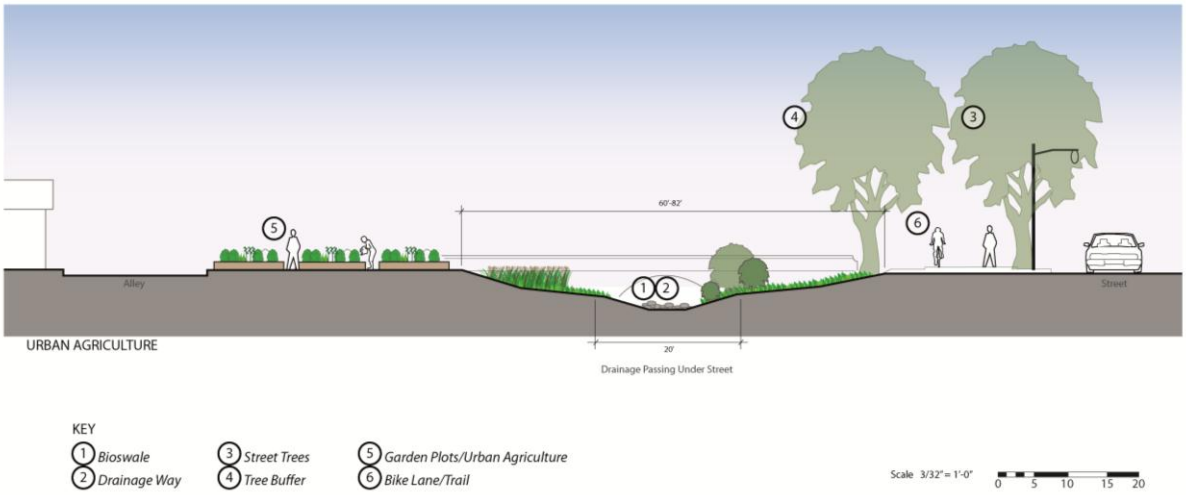


Figure ES-5. Conceptual Greenway Corridor Cross Section View on W. Clark Street from N. 30th Street to N. 27th Street

ES.5 A Catalyst for Re-Imagining the Corridor

The Greenway Corridor solution represents a bold vision by MMSD and WHEDA to address several fundamental challenges in the Corridor area associated with drainage and flooding problems. These problems result in significant damages to local residents, and are a contributing factor in limiting the economic growth of the area and overall quality of life. Although only one of many critical factors necessary for revitalization of the Corridor area, Greenway Corridor concept implementation can make a significant contribution to a broader solution that resolves a number of major environmental, economic, and social issues in the Corridor, and improves the overall quality of life for its residents and businesses.

Greenway Corridor Benefits and Value

The Greenway Corridor offers many primary and secondary benefits for not only those living immediately adjacent to the Greenway Corridor, but also to the residents of the entire Corridor area. GI, drainage improvements, environmental attributes, recreational features, and green open space all add value to the area. Measurable benefits can be realized not only for both near-term catalytic-type projects, but also for the long-term revitalization of the Corridor area, as shown in **Figure ES-6**.

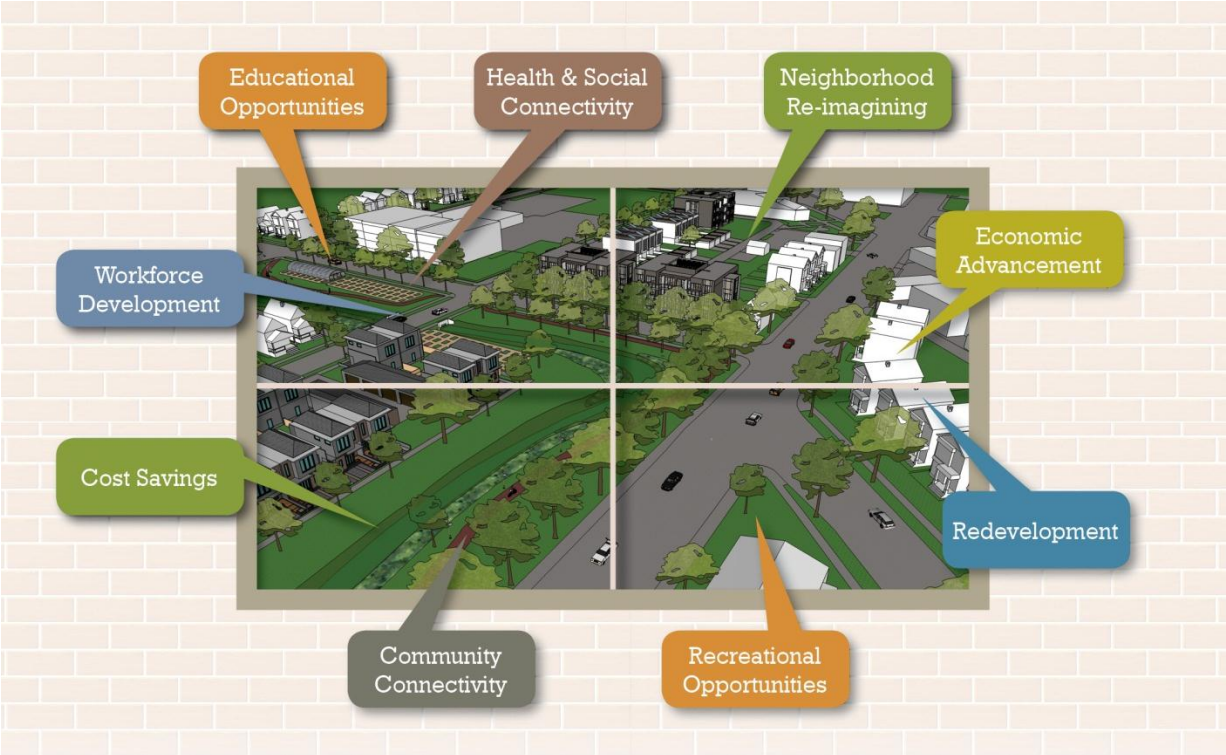


Figure ES-6. Greenway Corridor Benefits and Value

Job Creation and Workforce Development

The proposed Greenway Corridor improvements, combined with ongoing and planned redevelopment initiatives can be a major catalyst for economic redevelopment and job creation throughout the Corridor. The planned improvements will provide an influx of construction dollars over a number of years as the improvements are constructed and implemented. Estimates indicate that in the short term, nearly 1,300 jobs are anticipated to be associated with the construction of the Greenway Corridor and drainage improvements. An additional 70 long-term jobs are projected to be needed for the operations and maintenance of the Greenway Corridor improvements.

Several institutions and programs exist to leverage the Corridor project to ensure that the development of the workforce occurs to its full potential. MMSD, the City, Milwaukee County, the 30th Street Industrial Corridor Corporation (The Corridor), the Milwaukee Area Workforce Investment Board (MAWIB), the Wisconsin Regional Training Partnership/Building Industry Group Skilled Trades Employment Program (WRTP/BIG STEP), and WHEDA all have a role to contribute to workforce development for the Corridor area. These entities are responsible for a number of programs and initiatives related to creating job opportunities as well as the facilitation of training programs that will interface with the various Corridor related projects. Specific to its infrastructure work within its service area, MMSD has several facilitated training programs that are directly applicable to future Corridor work and potential job opportunities as presented in **Table ES-2**.

Table ES-2. MMSD-Facilitated Training Programs

Opportunities Provided or Facilitated by MMSD That Are Directly Applicable to the Greenway Corridor
Training to small and disadvantaged engineering and construction firms in the business development area to help them grow their businesses.
Engineering and Construction Management Training Program to increase the capabilities and capacity of local small business engineering and management staff.
RISE (Regional Internships in Science and Engineering), an intern program to provide local college/university students with internships and ideally long term job prospects.
Pre-Apprentice training through WRTP/BIG STEP to meet anticipated construction needs and requirements with the local workforce.
Green Infrastructure and its defined pathway to the construction trades.

MMSD and MAWIB routinely collaborate to define long-term and individual project strategies to achieve local workforce development goals through specific requirements in individual project bid documents. These strategies specify minimum requirements for local work force involvement and enhancement through individual construction projects associated with its service area.

Triple Bottom Line Benefits

Greenway Corridor Improvements offer exciting enhancement opportunities for economic growth, environmental awareness and positive social well-being that translate into directly quantifiable benefits for both the Corridor's immediate residents as well as the citizens of Milwaukee. Benefits include significant job opportunities, increased property values, and reductions in combined sewer overflows as summarized in **Figure ES-7**.

Social		
Recreational Opportunities	-	Playfields, game courts, and walk /bike path trails
Jobs Creation	-	1,300 short term and 70 long term jobs
Connectivity to Neighborhoods	-	8.5 miles of permeable pavement bike path
Economic		
Foreclosed Property Maintenance	-	$1.5 million in annual savings
Property Values	-	2- to 3-fold increases in property values
Environmental		
Water Quality Benefits	-	Reduced CSO volumes by 20 to 90 million gallons
Flood Damage Reductions	-	Savings of $130 million over 20 years
Area of Green Space	-	65 acres of green space

Figure ES-7. Greenway Corridor Triple Bottom Line Benefits

ES.6 Implementation

The timeline for implementation of the Greenway Corridor is at a formative stage with this report defining the first steps in the implementation process. A funding analysis for the Greenway Corridor solution is identified as one of the key first steps to implementation. Even in these difficult times, funding opportunities exist and must be explored for potential application to the Greenway Corridor project.

Funding, the First of Several Critical Initial Steps

The importance of securing an appropriate level of funding is the fundamental first step in defining an implementation timeline, but several additional activities should be initiated as soon as sufficient funding is available. As the CAC moves forward with implementation, the following tasks or activities should be initiated within the first six months of implementation:

- CAC Action Plan
- Community outreach
- Greenway Corridor Neighborhood Plan
- Economic analysis
- Required land preservation
- Funding plan
- Environmental review
- Workforce development strategy

Although the responsibility for establishing a schedule for implementation rests with the CAC, an initial timeline is presented in **Table ES-3** to begin this process and to identify several critical steps that must be taken as soon as practicable.

Greenway Corridor Early-out Projects

Early-out projects have been identified in the North Corridor area and have preliminary approval and funding in place. Design for the North Corridor stormwater solution is scheduled for completion in 2015 as the first early-out project with construction in 2016. Additional early-out projects may be identified as planning proceeds. These early-out projects will be significant first steps to reduce flood damages and will lay the groundwork for systematic implementation of the Greenway Corridor solution for the entire Corridor area.

Table ES-3. Greenway Corridor Timeline

	2015				2016			
	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Corridor Advisory Council Action Plan								
Community Outreach								
Greenway Corridor Neighborhood Plan								
Preliminary Engineering								
Design (TBD)								
Economic Analysis								
Required Land Preservation								
Funding Plan								
Parcel Acquisition Plan								
Property Acquisition (TBD)								
Environmental Review								
Environmental Assessment								
O&M Responsibility								
Early-out Project Implementation								
Workforce Development Strategy								
Greenway Corridor Construction (TBD)								

Workforce Development Strategy

MAWIB and MMSD are currently working together to develop a Workforce Development Strategy for the initial North Corridor construction projects to maximize the opportunity for job creation and worker skill acquisition. Some initial requirements include:

- A certain percentage of the work hours be provided by "Fresh Coast" workers. Although the percentage will vary depending on the specific project, selected projects could have a percentage as high as 50-60 percent
- Fresh Coast workers will be defined by a set of zip codes that include and surround the Corridor
- Utilizing prevailing wage rates and setting a wage floor on projects without prevailing wage requirements
- Maximize apprentice utilization through journey-worker to apprentice ratios
- Assistance by WRTP/BIG STEP in identifying the Fresh Coast workers

Section 1
Introduction

1.1 Background and Objectives

1.1.1 Background

The 30th Street Industrial Corridor (Corridor) is located in the City of Milwaukee (City), northwest of downtown. The Corridor is an older section of the City that was originally developed in the period from the late 1880's to the 1920's. While the area is largely residential, there is a strip of concentrated industrial land use several blocks wide that follows the Canadian Pacific Railroad along the entire north-south extent of the Corridor. Several of Milwaukee's most prominent employers are located along this industrial strip including DRS Power & Control Technologies, United Milwaukee Scrap, Master Lock, MillerCoors, and Harley-Davidson.

The Corridor area has experienced a continuous decline during the past few decades with a significant number of industries leaving the City. The area was hard hit by the recession from 2007 to 2009 and continues to experience problems associated with abandoned properties and foreclosures. The Corridor area is one of the most economically depressed areas of the City facing numerous challenges related to declining property values, high crime, and persistent unemployment. The area experiences widespread basement backup problems, surface ponding and associated flood damages during major rainfall events.

The City has been working with local, state and federal partners to redevelop the Corridor, moving forward on a number of initiatives, similar to the efforts that led into the revitalization of the Menomonee Valley. In 2012, Governor Scott Walker and the Wisconsin Housing and Economic Development Authority (WHEDA) unveiled Transform Milwaukee, a historic and comprehensive initiative aimed at growing the economy in the City. The Milwaukee Metropolitan Sewerage District (MMSD) initiated Corridor stormwater studies to analyze the flooding problems and develop recommendations to minimize the flooding and resulting property damage. In 2013, MMSD and WHEDA collaborated to create a vision of a 30th Street Greenway Corridor project (Greenway Corridor).

1.1.2 Mission

The Greenway Corridor project will mitigate surface flooding and basement backups, and improve water quality in the Corridor. It will also contribute to a broader initiative to revitalize the area, provide a platform for redevelopment, and preserve and connect adjacent neighborhoods. This outcome will be achieved by creating a Greenway Corridor that encourages active living, environmental sustainability, and economic development while linking many neighborhoods of the Corridor to the metropolitan Milwaukee area and beyond.

Two companion projects—the 30th Street Corridor Stormwater Study-North Section planning report and the 30th Street Corridor Stormwater Study-South Section planning report (North and South Corridor Reports)—provided the technical basis for the drainage way development, the core of the Greenway Corridor project. The Greenway Corridor is one component of Transform Milwaukee, a public-private partnership focusing on restoring economic prosperity to the industrial, residential, and transportation areas connecting the City Industrial Corridor, Menomonee Valley, Port of Milwaukee, and the Aerotropolis. The primary strategies for Transform Milwaukee are:

- Expand business development and innovation with new and existing financing resources to spur job creation

- Reduce the number of foreclosed and vacant properties to make neighborhoods more desirable for housing and business development
- Foster partnerships between state agencies and nonprofit community groups to increase job training, skill enhancement and educational opportunities
- Create stormwater runoff conveyance systems–bioswales–as an alternative to storm sewers to reduce future flooding events
- Direct resources to established intermodal transportation infrastructure–water, air, rail and highway systems

1.1.3 Objectives

The Greenway Corridor project must accomplish a number of primary and secondary objectives to achieve its overall mission. These objectives must be integrated together to produce a result that improves the environmental, social, and economic well-being of the Corridor area. They must also complement other parallel initiatives geared to improve the quality of life in the Corridor. Primary objectives include:

- Mitigating surface flooding, basement backups, and associated damages
- Linking neighborhoods together along and across the proposed Greenway Corridor
- Improving surface runoff water quality
- Bolstering property values by making the Greenway Corridor available for use by residents, area workers, and visitors
- Establishing the foundation for new economic growth and associated job creation

Secondary objectives include:

- Connecting the Greenway Corridor to the larger network of trails and environmental corridors in the Milwaukee area
- Developing an aesthetically pleasing, linear greenway system
- Providing opportunities for environmental education to be conducted along the Greenway Corridor
- Creating the potential for active recreation for health and well being
- Establishing places for residents to gather, meet, and socialize
- Implementing Crime Prevention Through Environmental Design (CPTED) standards
- Establishing community garden areas for residents to grow their own produce and reduce the food desert along the Corridor area

These above mentioned primary and secondary objectives complement the City, MMSD and WHEDA goals.

1.1.4 Project Partners and Stakeholder Involvement

The Greenway Corridor project is a joint effort led by MMSD and WHEDA in collaboration with the 30th Street Industrial Corridor Corporation (Corridor Corporation) and the City. These agencies formed the core of the Greenway Corridor team to foster the Greenway Corridor initiative, facilitating the participation of a

number of other agencies and interested parties to create the vision for the project. Collaboration and facilitation efforts included a series of meetings with the Stakeholder Group; special meetings with interested local, state, and federal agencies; and the formation of a Greenway Corridor Advisory Council to assist in this initiative.

1.1.4.1 Stakeholder Group

A stakeholder involvement plan was implemented for the Greenway Corridor to facilitate regular interaction with stakeholder representatives, to obtain their input at key project milestones and decisions, and to reach consensus on an overall drainage and Greenway Corridor solution. Seven workshops were held at different locations within the Corridor over a 17-month period. The stakeholder group was represented by selected organizations that could contribute to the formulation of an initial Greenway Corridor concept that would set the stage for additional community outreach in the next phase of the project. Stakeholder group representation included, but was not limited to, the Corridor Corporation, Wisconsin Department of Natural Resources (WDNR), the City, and local businesses such as Harley-Davidson. **Table 1-1** lists the stakeholder group representatives for the Greenway Corridor.

Table 1-1. Project Stakeholder Representatives

Harley-Davidson	Milwaukee Metropolitan Sewerage District
Master Lock	Wisconsin Housing and Economic Development Authority
Menomonee Valley Partners	Milwaukee Department of City Development (DCD)
Capitol Stampings	Wisconsin Department of Natural Resources (WDNR)
United Milwaukee Scrap	Milwaukee Department of Public Works (DPW)
Washington Park Partners	Merrill Park Neighborhood Association
30th Street Industrial Corridor Corporation	University of Wisconsin-Milwaukee
Lisbon Avenue Neighborhood Development	Children's Environmental Health Sciences Core Center
Citizens near Corridor Area	JONCO Industries
DRS Technologies	Milwaukee Area Workforce Investment Board (MAWIB)
Coalition for Hope Blockwatch	

1.1.4.2 Special Agency Collaboration Meetings

Two special meetings were held with a broader group of agencies and other parties to present the Greenway Corridor concept, discuss the overarching Corridor vision, identify funding opportunities and program synergies, and initiate potential partnerships. These meetings were held on January 10th and September 16th, 2013 and included the participation of the agencies shown in **Table 1-2**.

Table 1-2. Local, State and Federal Agencies	
30th Street Industrial Corridor Corporation	Milwaukee Metropolitan Sewerage District
Agency for Toxic Substances and Disease Registry	Milwaukee Office of Environmental Sustainability
City of Milwaukee-Department of Public Works	Northwest Side Community Development Corporation
City of Milwaukee-Department Of Administration-Intergovernmental Relations Division	Congresswoman Gwen Moore (Wisconsin's 4th District)
City of Milwaukee-Redevelopment Authority of the City of Milwaukee	U.S. Senator Ron Johnson
Wisconsin Coastal Management Program	Southeastern Wisconsin Regional Planning Commission
Corporation for National and Community Service	U.S. Department of Labor-Office of Federal Contract Compliance Programs
Department of Commerce-Economic Development Administration	U.S. Department of Labor
Federal Transit Administration	U.S. Environmental Protection Agency-Region V
General Services Administration-Chicago	U.S. Housing Urban Development
Department of Housing and Urban Development -Chicago	University of Wisconsin-Milwaukee
Milwaukee Education Partnership	Wisconsin Department of Children & Families
Wisconsin Department of Natural Resources	Wisconsin Housing and Economic Development Authority
Wisconsin Department of Transportation	

1.1.4.3 Corridor Advisory Council

On January 9th, 2014, MMSD brought together the Corridor Advisory Council (CAC), which is comprised of a number of partners whose work is engaged in or is influential to the Corridor area, including representatives from the City, faith-based groups, neighborhood representatives, financial agencies, and nonprofit organizations. Membership of the CAC includes:

- Milwaukee Metropolitan Sewerage District
- Wisconsin Housing and Economic Development Authority
- City of Milwaukee – Department of Public Works
- City of Milwaukee – Department of City Development
- 30th Street Industrial Corridor Corporation
- Milwaukee Pastors Strategy Group
- Department of Housing and Urban Development
- 1000 Friends of Wisconsin
- American Rivers
- Clean Wisconsin
- Holy Cathedral / Word of Hope
- Jabez Church
- Milwaukee Inner-City Congregations Allied for Hope
- Milwaukee Area Workforce Investment Board
- Milwaukee County
- New Hope Missionary Baptist Church
- Northwest Side Community Development Corporation
- Sixteenth Street Community Health Center
- Trust for Public Land (TPL)
- Uniting Garden Home, Inc.
- Urban League
- Victory Garden Initiative

This advisory group was assembled to discuss ongoing efforts in the Corridor and develop strong partnerships for moving forward. The group will meet periodically as detailed plans and activities are identified, and will facilitate the transition to funding and implementation of the Corridor improvements.

1.2 Corridor Description

As a major component of Milwaukee's economic engine, the Corridor experienced an extended period of growth and development. However, the downturn in American heavy industry in the late 20th century directly impacted the Corridor, contributing to its decline in industrial output, economic opportunities, and property values. These declines have led to broader social impacts that include job loss and unemployment, foreclosures, and increases in crime. Infrastructure limitations in the area have resulted in surface drainage problems and basement backups, contributing to further reductions in property values and economic opportunities for the area. These problems are a major factor in the overall decline of the Corridor and have established a critical need for revitalization of its neighborhoods and re-creation of economic opportunities for its residents—fundamental objectives for the Greenway Corridor project.

1.2.1 Corridor History

In the last half of the nineteenth century, the discovery of iron ore in Dodge County fueled Milwaukee's steel, iron, and manufacturing industries. In response, the Corridor area sprang up along the railroad lines from W. Hampton to W. Highland Avenues and N. 27th to N. 35th Streets. Much of the Corridor area developed to transform raw materials into finished products along a central rail line through the center of it. Over the last quarter of the 20th century, the Corridor area's economic wellbeing depended on the vitality of its manufacturing sector, spurring growth as stable blue-collar neighborhoods, as well as satellite suppliers and specialty shops.

Figure 1-1. MillerCoors Facility

Figure 1-2. Harley-Davidson Works in 1911

MillerCoors, which anchors the south end of the Corridor area, grew from the dreams of a German entrepreneur, Frederick Miller, who came to America in the mid-19th Century. Miller Brewing Company was founded in 1855 when Miller purchased the small Plank Road Brewery. The brewery's location in the City's Menomonee Valley provided easy access to raw materials produced on nearby farms, with the small brewery expanding into the current facility that exists today.

Figure 1-3. Esser Paint Building and Railroad Tracks

The largest of the manufacturing companies in the Corridor area was A.O. Smith, located along W. Hopkins Avenue from N. 27th Street to W. Capitol Drive. Founded in 1874 as a parts maker for baby carriages, A.O. Smith expanded its operations to bicycle frames and then to pressed steel car frames in 1899. In 1904, A.O. Smith dominated the neighborhood in both size and employment. At its peak, 10,000 local residents were employed by A.O. Smith at its 84-acre complex.

In 1906, the Harley and Davidson brothers built their first factory on W. Chestnut Street (later Juneau Avenue), and the location remains as Harley-Davidson's corporate headquarters. In 1910, the factory, with its many additions, took up two blocks along W. Juneau Avenue and around the corner of N. 38th Street. By the early 20th century, other important companies began manufacturing businesses in the Corridor, including Master Lock, Esser Paint, and Steeltech Manufacturing.

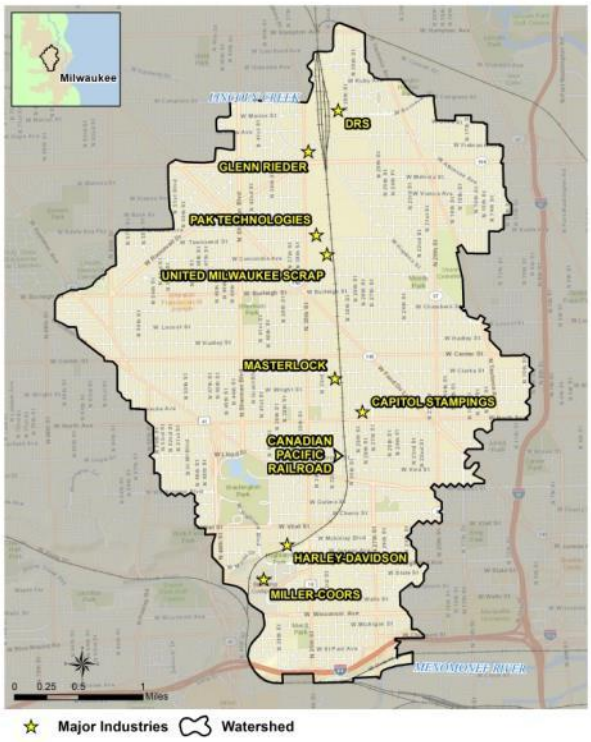


Figure 1-4. Corridor Study Area

1.2.2 Urban Setting and Corridor Characterization

The Corridor area is a historic employment center where companies such as Eaton and A.O. Smith employed thousands of workers. The core of the Corridor area is generally bounded by Hampton Avenue on the north, 27th Street on the east, Wisconsin Avenue on the south and 35th Street on the west, and encompasses many neighborhoods such as Garden Homes, Franklin Heights, Villard, Miller Valley, Sherman Park, Walnut Hill, Lincoln Creek, Metcalf Park, and Washington Park. **Figure 1-4** shows the Corridor study area and the locations of the major industries.

The Corridor watershed begins approximately one mile west of I-43, extends west to US Highway 41, and ranges north from I-94 for approximately five miles to Hampton Avenue. Capitol Drive is the largest commercial arterial street in the Corridor and separates the Corridor between its largest parcel, the former A.O. Smith Site, and several of the Corridor's larger tenants—Integrated Mail Industries, DRS Power and Control Technologies, and Glenn Rieder.

Several major east/west arterials cross the project area, beginning in the north end with Townsend Street and moving south with Burleigh Street, Locust Street, Center Street, North Avenue, Highland Boulevard, and Wisconsin Avenue. Major north/south aerials are N. 27th Street and N. 35th Street. The Canadian Pacific Railroad bisects the corridor running north and south with industrial facilities located adjacent to it.

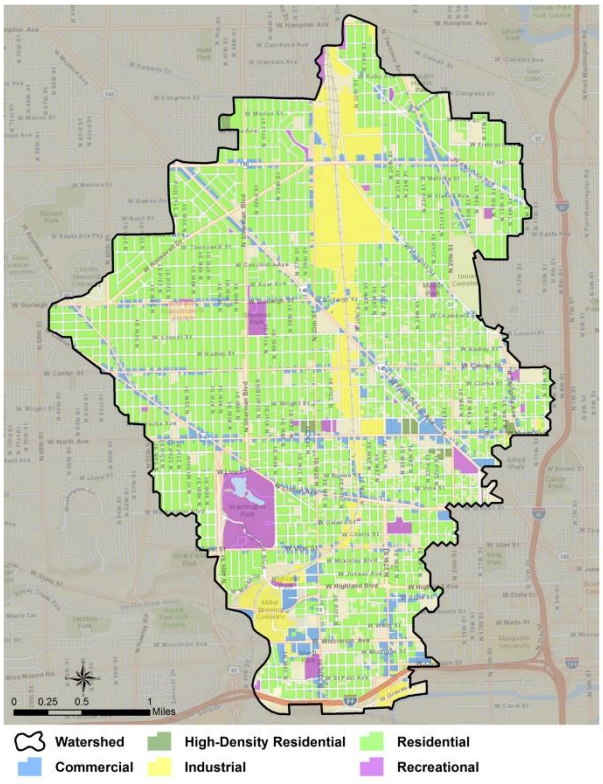


Figure 1-5. Corridor Land Use Distribution

Although the corridor has 513 acres of industrial-zoned land, roughly half of the industrial land is vacant and/ or classified as brownfield, and is expensive to redevelop. In the past five years, the City has been working to prepare the Corridor for redevelopment and revitalization, and has moved forward on a number of initiatives working with the U.S.

Environmental Protection Agency (EPA) to mitigate brownfields; however, there are additional challenges that still need to be addressed.

The former Tower Automotive and A.O. Smith manufacturing complex, now called Century City, is a vacant 84-acre industrial site in the northern end of the Corridor. This site is the largest brownfield in the State of Wisconsin, and is currently being redeveloped by the City. This property represents the most significant land use redevelopment for the Corridor area. **Figure 1-5** shows the Corridor land use distribution. The yellow shaded areas represent the "industrial" land uses and green shaded areas represent the "residential" land uses.

1.2.3 Watersheds and Drainage

The Corridor watershed drains an area of approximately 11 square miles. The watershed generally north of Townsend Avenue (North Corridor) discharges to Lincoln Creek and the watershed south of Townsend Avenue (South Corridor) discharges to the Menomonee River. **Figure 1-6** shows the historical wetlands and streams of the Corridor. Historically, there were several streams and wetlands within the Corridor. Due to man-made improvements over the years, the natural streams and wetlands were converted to residential and industrial land uses.

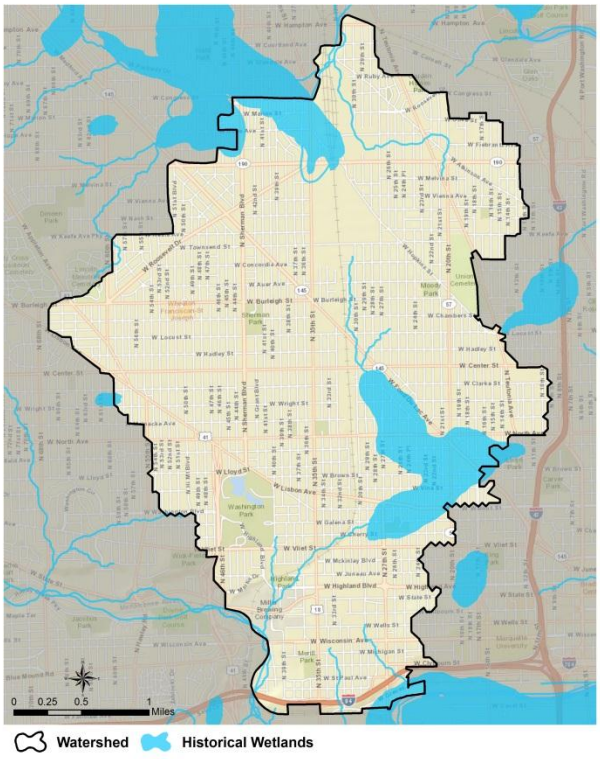


Figure 1-6. Corridor Historical Wetlands and Streams

Figure 1-7 shows the drainage system of the North and South Corridor watersheds. The North Corridor watershed drains an area of 4.4 square miles, and is drained by both combined (stormwater and sewage), sanitary (sewage only), and storm sewers (only stormwater runoff). The South corridor watershed drains an area of 6.3 square miles and is predominantly drained by combined sewers with some storm sewer systems on the west side of the watershed.

The North and South Corridor watersheds, with both separate sanitary and combined sewers, discharge into MMSD's conveyance systems: the Metropolitan Interceptor Sewers (MIS), the Near Surface Collectors (NSC) and the Inline Storage System (ISS). Separate sanitary sewer flows in the North Corridor watershed are conveyed to the MIS and then to the Jones Island Water Reclamation Facility (JIWRF) for treatment. The combined sewers, which carry both sanitary sewage and stormwater runoff, discharge dry weather flows to the JIWRF for treatment. During small rainfall

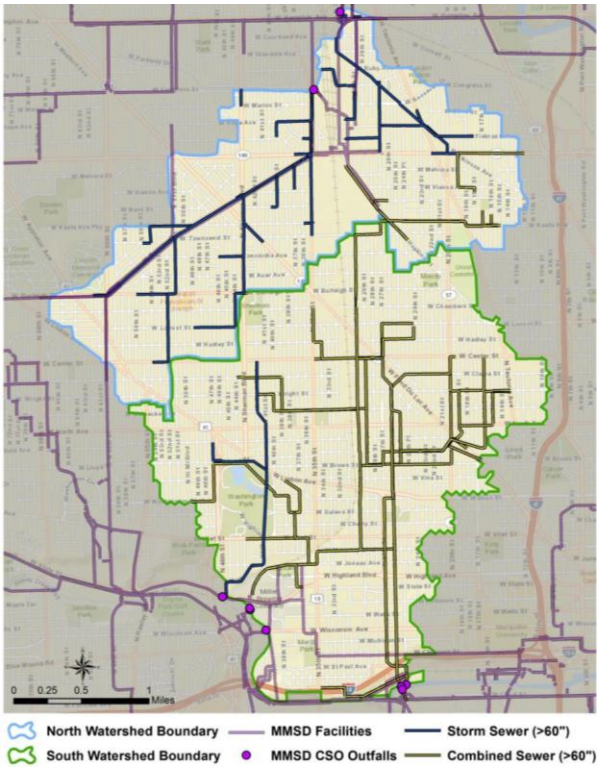


Figure 1-7. Corridor Drainage System

events, the combined sanitary and stormwater flows are diverted to the NSC sewers, into the ISS, and then to the JIWRF for treatment. When the ISS capacity is exceeded, combined sewer overflows (CSO) occur when excess flows are discharged to the local receiving waters to avoid causing basement backups. In the North Corridor watershed, excess combined sewer flows are discharged into Lincoln Creek. In the South Corridor, excess combined sewer flows are discharged into the Menomonee River. Separate stormwater flows from North Corridor storm sewers discharge into Lincoln Creek and separate stormwater flows from South Corridor storm sewers discharge into Menomonee River.

1.2.4 Corridor Challenges

The Corridor area has experienced a continuous decline during the past few decades with a significant number of industries leaving the City. The area was hit hard by the recession from 2007 to 2009, and continues to experience problems associated with abandoned properties and foreclosures. The Corridor area is one of the most economically depressed areas of the City, facing numerous challenges related to declining property values, high crime, and persistent unemployment. In addition, the area experiences widespread basement backup problems, surface ponding, and associated flood damages during major rainfall events.

1.2.4.1 Surface Flooding and Basement Backups

The City's combined sewers are generally designed for a 10-percent annual exceedance probability storm event—a 10-percent annual exceedance probability storm event has a 1 in 10 chance of being equaled or exceeded in any given year, and has an average recurrence interval of once every 10 years. The 10-percent annual exceedance is a reasonable and relatively common design standard for combined sewers.

The combined sewer system currently drains the majority of the area, replacing the original natural overland flow, wetland, and drainage features that were modified during development of the area. As a result, the combined system serves as the primary drainage system for the area. A storm event greater than the 10-percent annual exceedance probability event will begin to stress the City's combined sewers and MMSD's conveyance systems. Severe rainfall events, finite sewer capacity, the lack of defined continuous overland flow paths, and the limited capacity of the receiving system results in basement backups and flooding problems.

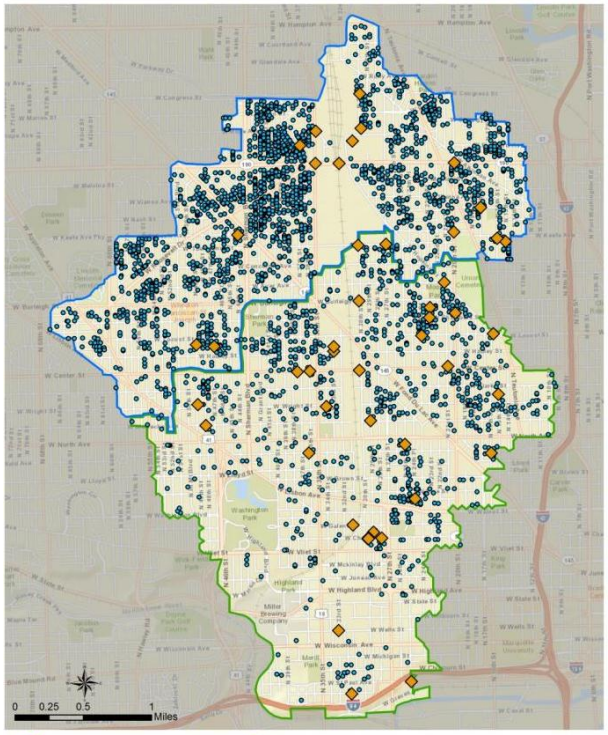


Figure 1-8. July 2010 Storm Event Reported Drainage Problems

Combined Sewer Overflows (CSO) occasionally occur to minimize sewage from backing up into basements. On July 22, 2010, the Milwaukee metropolitan area experienced a major storm event that resulted in widespread surface flooding and backups. According to the chief meteorologist at WTMJ-TV (NWS, 2010), the City's northeast side experienced 8.31 inches of rain recorded over a 24-hour period, with a maximum of 6.73 inches in one hour. Approximately 3,000 properties in the Corridor were reported to have had basement backup problems and approximately 50 street locations experienced surface flooding during this storm event. **Figure 1-8** illustrates the locations of reported basement backups and surface flooding within

the Corridor for the July 2010 storm event. Private sector damages in the Corridor alone exceeded $32 million. The proposed Greenway Corridor will significantly reduce these surface flooding and basement backups in the Corridor.

1.2.4.2 Foreclosures and Vacancy

The collapse of the national housing market in 2007 (CBSNEWS, 2012) has resulted in a dramatic increase in foreclosures across the nation, state, and in Milwaukee County. **Figure 1-9** shows the foreclosures in and around the Corridor area. There are approximately 1,000 foreclosures within the Corridor area. The initial effects of foreclosures can result in the displacement of homeowners and put mortgage lenders at risk. These impacts extend into nearby neighborhoods and adjacent municipalities, and result in:

- **Degradation of the property:** as a property sits vacant, utilities are turned off, vital core elements become deficient, including plumbing, structural features, and heating, ventilation, and air conditioning (HVAC) systems. The property can become a haven for illegal activities often leading to complete degradation.
- **Reduced adjacent property values:** as a property sells at a discount via sheriff's sales or auctions, adjacent properties are valued at reduced prices as well. A sampling of property values in the proposed Greenway Corridor range from $10,000 - $30,000 compared to adjacent neighborhood property values ranging from $40,000 - $70,000.
- **Vagrancy occupation:** as a property sits vacant, it often receives little oversight and can suffer from vagrant occupation and further deterioration.

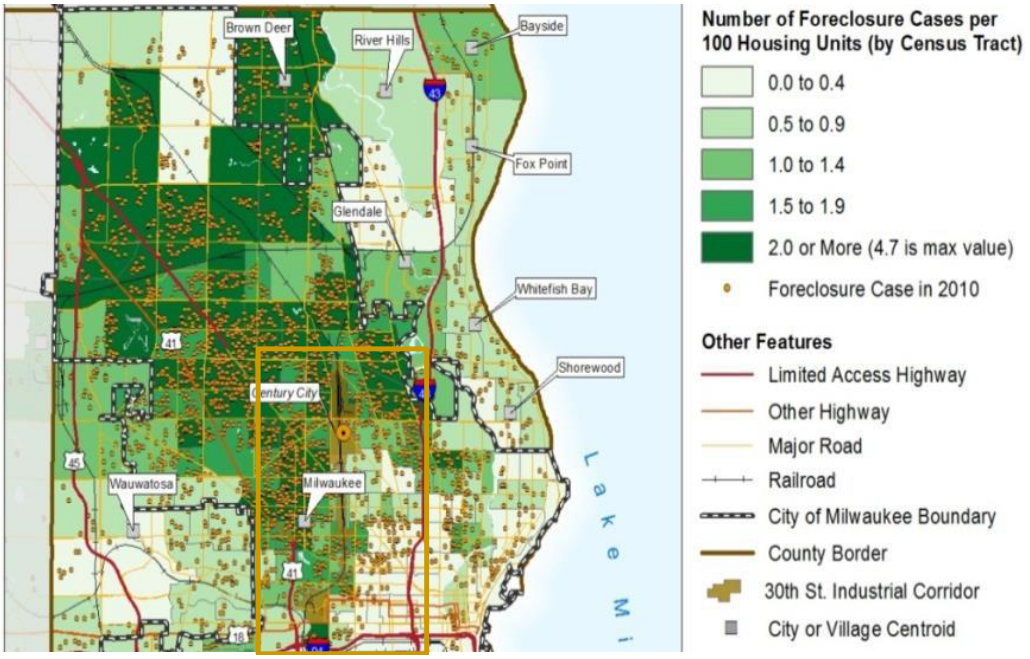


Figure 1-9. Foreclosures near Corridor Area
(Source: UW Extension and WHEDA)

The City's housing vacancy is above the national average with some census tracts exceeding 10 percent in the project area as shown in **Figure 1-10.**

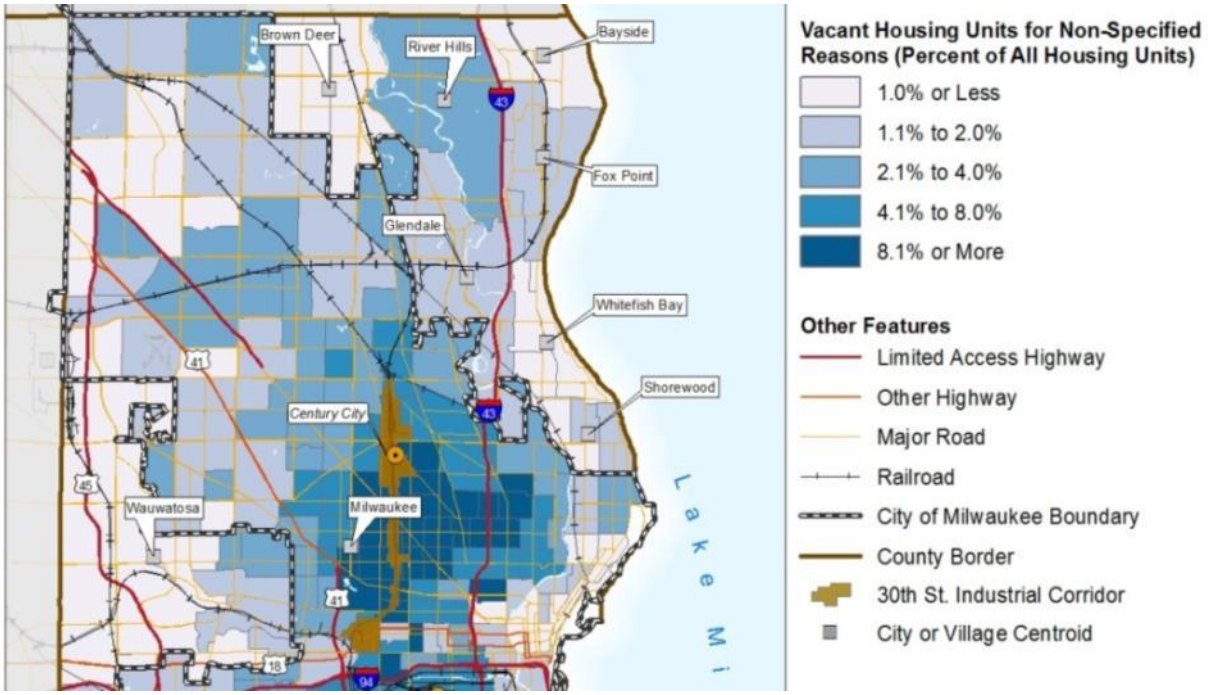


Figure 1-10. Vacant Housing near Corridor Area
(Source: UW Extension and WHEDA)

Foreclosure and vacant properties can be reduced by revitalizing the Corridor area. The proposed Greenway Corridor will create redevelopment opportunities and provide neighborhood stability.

1.2.4.3 Crime

According to Federal Bureau of Investigation (FBI) crime statistics for 2012, the City has a ranking of five out of 100, making it only safer than 5 percent of other cities in the United States (FBI.gov, 2012). The City has a violent crime rate of 9.99 per 1,000 residents, or over twice the national average (3.91) and three times the state (2.37) average. For property crime, the City has an incidence rate of 50.9 per 1,000 residents compared to 29.1 and 24.3 for the national and state averages, respectively. Crime reduces desirability for residents to live in a city and neighborhood, and this has the effects of lowering property values, dissuading employers from locating in the area, and reducing the quality of life of existing residents. The Corridor area has the least safe census tracks in the Milwaukee area. **Figure 1-11** shows the "Least Safe" and "Most Safe" areas in the Corridor. The cumulative impact of many opportunities and enhancements associated with the Greenway

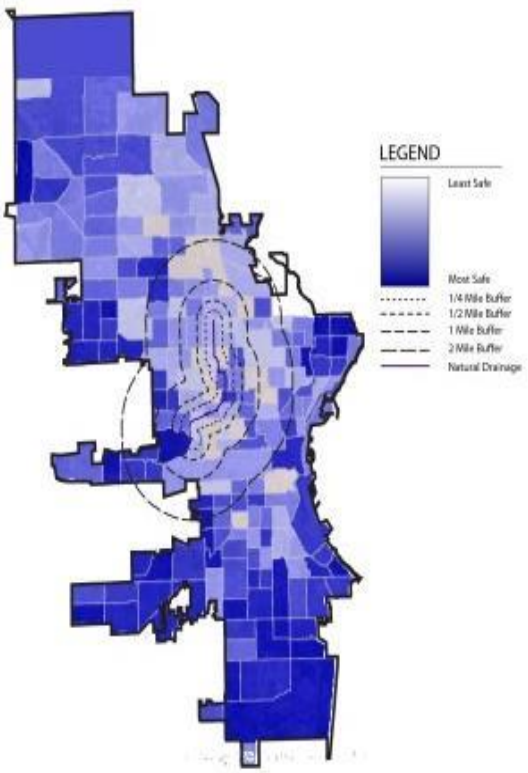


Figure 1-11. Crime near Corridor Area
(Source: UW Extension and WHEDA)

Corridor is expected to be accompanied by a corresponding reduction in crime over the long term.

1.2.4.4 Environmental

Milwaukee has a long history of industrial activity at a time when environmental regulations were far less stringent than they are today. There are considerable residential brownfields due to the use of toxic materials such as lead paint. In the City, there are 7,770 acres of brownfields. In the Corridor area alone, there are 771 acres of brownfields as illustrated in **Figure 1-12**.

The American Lung Association gives Milwaukee County a grade of F, which is based on the number of days when air quality is unhealthy for people in sensitive groups—especially children, the elderly, and those with respiratory issues. Milwaukee County had 10 such days in 2011, the most recent year where data was available (Bergquist, 2013).

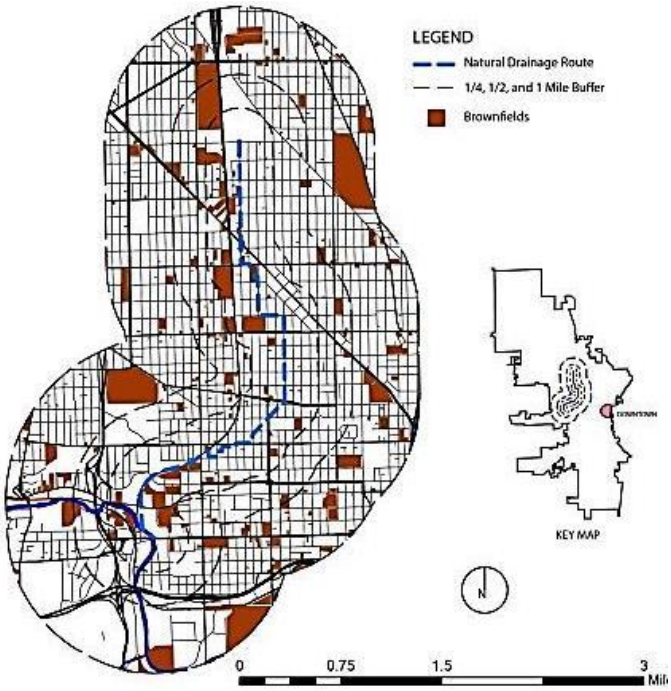


Figure 1-12. Brownfields within Corridor Area
(Source: UW Extension and WHEDA)

The City and Milwaukee County have made great improvements to water quality of its waterways. MMSD has reduced the number of sewage releases in the past two decades from roughly 50-60 per year to two to three per year (MMSD, 2012). The main challenge for water quality in the Milwaukee area is polluted stormwater runoff. As stormwater sheet-flows over impervious surfaces, it picks up oil, heavy metals, sediment, and other pollutants, which are ultimately deposited into Lake Michigan. The proposed Greenway Corridor will provide opportunities to convert the existing brownfields into future redevelopment and will produce improvements in stormwater quality for the area.

1.2.4.5 Low Property Values

Extremely low assessed property values as illustrated in **Figure 1-13** represent the current problem along the Corridor. While low property values make it easier for people to afford a home, it is symptomatic of the many other serious problems discussed in this section of the City, such as high crime, flooding risks, low employment options, and brownfield sites.

The majority of the housing in the Corridor area was constructed between 1880 and 1920 to support the workers employed in the nearby industrial and manufacturing centers. As employment has declined in the area, so has the demand for housing. High vacancies and

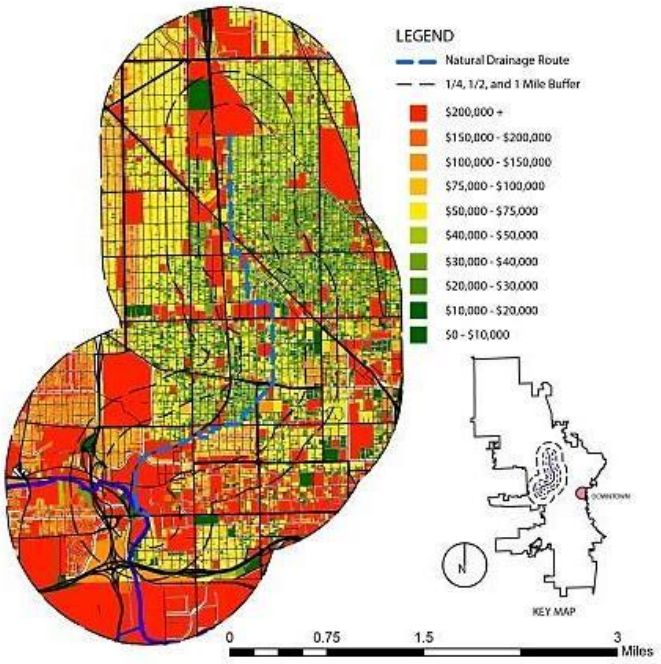


Figure 1-13. Property Values near Corridor Area
(Source: UW Extension and WHEDA)

foreclosures in the area indicate an excess of housing along the Corridor. Recent blight elimination conducted by WHEDA and the City has focused on demolishing the most-neglected properties to reduce excess housing and provide opportunities for redevelopment. Property values in the Corridor are a significant concern for the City, whose revenues are dependent upon the value of its tax base. City services and tax rates are a direct result of property values. If housing demand can be increased by attracting employers and mitigating the issues described in this section, property tax revenues will increase and City services can be elevated.

1.3 Corridor Revitalization

MMSD initiated the North Corridor stormwater study in 2012 to analyze the flooding problems in the North Corridor and develop recommendations to minimize the flooding and resulting property damage. In 2013, MMSD and WHEDA initiated activities to address the stormwater issues in the South Corridor while facilitating economic redevelopment efforts, and collaborating to create a vision of a Greenway Corridor. This vision would not only address the drainage problems, but also would serve as a platform for redevelopment and revitalization that could lead to enhanced safety, job creation opportunities, increased property values, recreational opportunities, and neighborhood stability.

Section 2
Greenway Concepts and Opportunities

2.1 Vision

The Corridor area developed in a rather short time span in the late 19th and early 20th centuries. As neighborhoods grew adjacent to the employment opportunities provided by the Corridor, these neighborhoods expanded to provide the necessary housing and meet employment needs with little attention to open space and park needs. At the time, this part of the City was not able to benefit from the evolving park planning efforts of Charles Whitnall, Secretary of the Milwaukee County Parks Commission from 1907-1941, who successfully advocated for acquiring lands along Milwaukee County's lakefront and waterways for public parks. The Corridor area neighborhoods had no such waterways and, to this day, lack green space for recreation and connection to the County's network of greenway spaces.

The notion that this green space deficiency could in part be addressed by a new greenway infrastructure solution to the area's heavy flooding damages was put forward by MMSD and WHEDA in a collaborative effort to address the major challenges facing the Corridor. Their vision defined a stormwater surface drainage way, with the introduction of adjacent vegetation to "green" the new infrastructure and the adjacent community. The Greenway Corridor Vision integrates drainage and other greenway opportunities to address stormwater and basement backup problems, while at the same time improving the quality of life in the Corridor neighborhoods. **Figure 2-1** presents a vision of the Corridor where urban decay and underutilized properties are replaced with a Greenway Corridor that serves as a backbone for needed drainage improvements and is complemented by other greenway elements that provide opportunities for open space, recreation, and urban agriculture, which all contribute to an improved quality of life for the area.

Figure 2-1. Greenway Corridor Vision

2.2 Corridor Concept

Greenways have been defined in many ways and can be found serving the needs of people in many cultures worldwide. They offer a common thread of improving the quality of life for users, in part by providing recreation opportunities linked to raising awareness of the natural and cultural environment. Greenways occur in widely divergent settlement patterns and successful models can be found in urban, suburban, and rural areas. In their most idealized form, greenways provide contiguous non-motorized, soft-traffic connections between the city and the country, thereby creating a network of linked landscapes.

Figure 2-2. Example Greenway (East London Greenway)

Greenways are highly adaptable to varied contexts and are compatible with an array of land uses. They are thresholds and transitions to many types of places of mixed purposes. Applied in rural settings, they have been associated with conserving prime agricultural land. In urban areas, they are often tied to playfields and other community facilities. Additionally, they can be used to integrate open space uses with stormwater management facilities, as shown in **Figure 2-3.**

Figure 2-3. Integrated Greenway/Stormwater Management Facilities (Santa Rosa, California)

2.2.1 The Menomonee Valley Model

The Corridor revitalization is not a first for the City. The Menomonee Valley (Valley) corridor and the associated Hank Aaron Trail have seen significant success with over 10 million people visiting the recreation and entertainment destinations in the Valley every year.

Prior to the original development, the Valley was a 1,200-acre wild rice marsh. To make the land developable, local residents filled the marsh with soil, gravel, and debris to create dry land for additional development. They also straightened the Menomonee River to increase its navigability for barges and other small ships. By the turn of the 19th Century, Milwaukee was known as the "Machine Shop of the World", making farm machinery, rail cars, electric motors, and cranes with the Valley as its heart. Thousands of workers arrived in the Valley for the employment opportunities and established the first large residential neighborhoods west of downtown.

By the late 1900s, the Valley was outdated in its manufacturing practices; buildings were blighted and abandoned, and the land was contaminated and polluted from decades of industrial activity. Bridges into the Valley were demolished as businesses left and the Valley was isolated from the surrounding city. The neighborhoods adjacent to the Valley were severely impacted as jobs evaporated and there was less money to support local businesses.

Figure 2-4. Milwaukee Road Shops (1879 – 1985)

The Valley greatly declined after the mid-1960s as rail and canal transportation gave way to trucking transportation, and manufacturing jobs were lost to more efficient production facilities and offshore manufacturing competition. The Valley was also plagued by a glut of brownfields from decades of manufacturing pollution.

Figure 2-5. Concept Plan Showing Industrial Business Center and Community Park

To spur redevelopment, the City purchased and land banked much of the property in the Valley. Working with the EPA, the City conducted a $20 million remediation of the soil to prepare it for potential redevelopment. Momentum increased in the 1990s with the creation of the Menomonee Valley Partners (MVP), whose members represent a comprehensive range of interests: Valley business owners, public officials, neighborhood groups, landscape architects, educators, and community advocates. MVP's stated goal is nothing less than to "Revitalize the Valley," with an emphasis on "high-quality, high-yield development." Anchors such as Potawatomi Bingo Casino and MMSD spurred development. Marquette University built an athletic field across the river just south of the main campus; Emmpak Foods helped to beautify the area with a sculpture garden; and Harley-Davidson built a $75 million 130,000-square-foot Harley-Davidson Museum at 6th & Canal Streets. A segment of the Hank Aaron Trail was also paved along the Menomonee River to return public access to the waterway. The abandoned 140-acre Milwaukee Road yards were made into a business park with an innovative stormwater runoff buffer using native plants. The Valley revitalization is the model the City and others look to replicate throughout the City and County.

One of the key components of the revitalization of the Valley was the creation of the Hank Aaron Trail. The goal of this trail was to restore, protect, and enhance the natural, scenic, historical, and cultural resources of the Menomonee River corridor while providing the public with recreational opportunities and access to the river.

Figure 2-6. Biking and Walking Trails

The Hank Aaron Trail, as shown in **Figure 2-6**, is designed for bicyclists, walkers, runners, and skaters. It is a 12-mile, continuous, dedicated trail with marked streets between the lakefront and Milwaukee's west end. The Trail starts at Lakeshore State Park near the Henry W. Maier Festival Grounds, winds its way through the Historic Third Ward and Menomonee River Valley past Miller Park, and then points west by accessing the new bridge at 37th Street. The Trail links to Milwaukee County's 100-mile Oak Leaf Trail at both its east and west ends, making it possible to bike from Lake Michigan along several trails across the state, and eventually link to the Ice Age National Scenic Trail, Glacial Drumlin State Trail, and Military Ridge State Trail.

The Valley revitalization and the implementation of the Hank Aaron Trail have helped 39 companies move to or expand in the Valley, creating over 5,200 jobs. The revitalization included 45 acres of native plants and wildlife habitat that is utilized by the Urban Ecology Center (UEC) to facilitate its environmental education mission, and a shared stormwater treatment

system, which is nationally recognized for its water quality benefits to the Menomonee River and Lake Michigan. Perhaps the most significant metric is that 10 million people visit the Valley's recreation and entertainment destinations every year.

The Valley is a local model for economic and environmental revitalization. It connects businesses to adjacent neighborhoods while providing residents, both local and non-local, with recreational opportunities. The Valley has been recognized by the Sierra Club as "One of the 10 Best Developments in the Nation."

2.3 Greenway Corridor Elements

Greenways can connect urban neighborhoods to local parks, business, and shops through a network of trails and paths. Greenway trails can be paved or unpaved, and can be designed to accommodate a variety of trail users, including bicyclists, walkers, hikers, joggers, skaters, horseback riders, and wheelchairs. These strips of green through the urban environment provide green infrastructure, open space, vegetative buffers, urban agriculture and other elements that comprise a comprehensive greenway system. Greenways complement important stormwater management and drainage components that reduce flooding and basement backups. In the end, multiple elements ranging from bike paths to stormwater trees can be selectively combined into a comprehensive and continuous Greenway Corridor concept integrating specific local opportunities and basin-wide drainage needs to provide environmental, economic, and social benefits to the entire Corridor area.

Figure 2-7. Accessibility through Walk/Bike Paths (Menomonee Valley, Milwaukee)

2.3.1 Walkability

Better walkability means a safer environment for walking and better access to more places without having to rely on a car. According to "Walk Score.com," most of the neighborhoods in the Corridor area such as Walnut Hill and Sherman Park have walkability ratings of "Somewhat Walkable," while several neighborhoods in the north end of the Corridor area such as West Roosevelt Drive and Franklin Heights have walkability ratings of "Car-dependent." (Walkscore.com, 2014). A simple paved path within a Greenway Corridor can greatly improve neighborhood walkability by giving more people the opportunity to walk for transportation, recreation, and health.

2.3.2 Bicycle Trails

Bicycle trails have clear quality-of-life benefits for local residents. These routes increase bicycle mobility and are a safer alternative to city street travel. Although the City has several East-West bike routes through the Corridor area, it lacks a clear North-South connection that could be provided within an urban greenway.

Figure 2-8. Bicycle Trails (East Side, Milwaukee)

2.3.3 Trail Systems

Trail systems, like Milwaukee County's Oak Leaf Trail, are greenway ribbons connecting parks, neighborhoods, and communities across the county. Many consist of paved trails separated from the street but may also include quiet parkway drives, and, where necessary, municipal streets.

Figure 2-9. Walking Trails (Elm Grove, Wisconsin)

2.3.4 Green Infrastructure

VEGETATED BUFFER	CONSTRUCTED WETLANDS
PERMEABLE PAVEMENT	BIOSWALES
RAIN GARDENS	STORMWATER TREES
NATIVE LANDSCAPING	

Figure 2-10. Green Infrastructure Strategies

Per MMSD's 2035 Vision, GI uses management approaches and technologies to infiltrate, evaporate, capture, and reuse water to maintain or restore natural hydrology. The preservation and restoration of natural landscape features, such as forests, floodplains, and wetlands, are critical components of GI. On a smaller scale, GI practices include rain gardens, permeable pavements, greenway roofs, bio-swales, trees, and rainwater harvesting. GI is a fundamental component of any greenway system, encompassing multiple green elements to reduce stormwater runoff and improve water quality while providing an overall "greening" of the area.

2.3.4.1 Vegetated Buffer

Vegetated buffers can be placed along bike paths, sidewalks, riverbanks, and streets to offer visual shielding, vertical diversity, and separation between different land uses, while at the same time acting as permeable zones that naturally store and infiltrate a portion of stormwater runoff into the ground. Buffers help to filter, diffuse, and evapotranspire both rainwater and snow melt. They are often planted in native vegetation, but can be engineered as strips of mowed grass, landscaping, or gardens.

Figure 2-11. Vegetated Buffer (Brown Deer, Wisconsin)

2.3.4.2 Constructed Wetlands

Wetlands are areas that have soils that are inundated or saturated for part of the year or for the entire year, supporting wetland vegetation. In their natural or man-made form, wetlands reduce and help solve stormwater runoff problems by catching and slowing the movement of stormwater. They help filter and clean runoff water and increase ground water aquifer recharge. Wetlands also provide for diverse flora and fauna, including birds, aquatic insects, fish, and amphibians, and can contribute to nature-based educational opportunities for local residents.

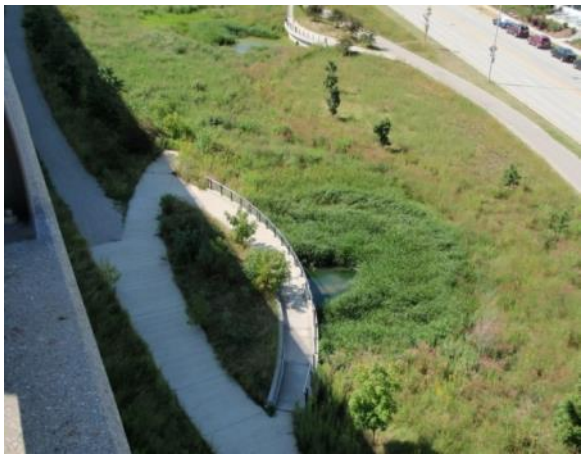


Figure 2-12. Constructed Wetlands (Menomonee Valley, Milwaukee)

2.3.4.3 Permeable Pavement

Permeable pavement can reduce and infiltrate a portion of surface runoff through its permeable surface into a stone or filter media below, and ultimately to the underlying soil. Stormwater is allowed to percolate into the ground, be conveyed off site as part of a stormwater system, or is collected and contained for future use. Permeable pavement material can be asphalt, concrete, or pavers. Permeable pavement differs from traditional pavement material because it excludes fine material, and instead provides pore spaces that store and pass water.

Figure 2-13. Permeable Pavement (Boerner Botanical Gardens, Hales Corners)

2.3.4.4 Bioswales

Bioswales capture dirty stormwater runoff from roads and parking lots, infiltrating it into the ground and cleaning it naturally using vegetation and soil materials that help clean polluted water. They can be installed as meandering or straight channels depending on available land, and are designed to maximize the time rainwater spends in the swale to improve water quality and enhance infiltration.

Figure 2-14. Bioswales (Greenfield, Wisconsin)

2.3.4.5 Rain Gardens

Rain gardens are watered by collected or pooled stormwater runoff, slowly infiltrating it into the ground along root pathways. They are typically planted with wildflowers and deep-rooted native vegetation, which helps infiltrate rain channeled to them from roofs, driveways, streets, and other impervious surfaces, but they can also be simple grass-lined depressions that capture first-flush rain water to reduce pollutants and stormwater runoff.

Figure 2-15. Rain Gardens (Bradford Beach, Milwaukee)

2.3.4.6 Stormwater Trees

Stormwater trees can hold rainwater on their leaves and branches, assist with infiltration, absorb it through root systems, and evapotranspire it to the atmosphere. They can be used in conjunction with engineered soils and other types of GI to provide a sustainable means to reduce stormwater runoff and, at the same time, create a greening of the urban landscape.

Figure 2-16. Stormwater Trees (Columbus, Indiana)

2.3.4.7 Native Landscaping

Native landscaping (also known as conservation landscaping) is the use of native plant species that can tolerate the drought and flooding cycles of an area for natural buffers and green open space. Native plants are those that evolved in a particular area and have adapted to local climate conditions. Native landscaping can include prairie and other plants that provide habitat for native animal species.

Figure 2-17. Native Landscaping (Menomonee Valley, Milwaukee)

2.3.5 Urban Agriculture

"The vegetable garden, it turns out, is a ripening political force: the best response to the energy crisis, the climate crisis, the obesity crisis, the family crisis, and the financial crisis," (Dominique Browning, 2011). Food is a "mega trend" in the media. From television cooking shows to documentaries on nutrition and the agricultural industry to legislative initiatives addressing public health issues, food awareness is increasing. In growing numbers, City dwellers are feeling satisfaction and empowerment from growing their own food in their back yards or collectively with neighbors in community gardens on residual parcels of public land where plots are made available. Nationally and locally, organizations have evolved with a focus on the integration of food production and city life. At the broad scale of planning and urban design, "Agricultural Urbanism" is making strides as a component of the sustainability movement. Commercially, "Artisan Agriculture" describes skills and careers advancing knowledge associated with producing high-quality, high-value food within the tighter confines of the existing urban fabric. Community organizations like the Victory Garden Initiative bring urban gardeners together in Milwaukee. Recognizing the opportunity and local implications of these trends, what follows are several elements of urban agriculture that can be integrated into the greenway design.

Figure 2-18. Urban Agriculture (Milwaukee)

Figure 2-19. Garden Plots on Vacant Land (Bay View)

2.3.5.1 Vacant Common Land

The City's Seasonal Garden Plot Pilot Permit Program gives individuals licenses to garden vacant land for a single growing season. The DCD also offers three-year leases to community agriculture groups. The use of vacant common land for urban farming is crucial in building and sustaining an urban food system and provides positive use for vacant property that is otherwise abused. Urban agriculture helps in brownfield remediation, adds to water retention strategies and green economic opportunities.

2.3.5.2 Community Connectivity

Programs like the City's Walnut Way show that local resource programs, education, and community connectivity follow in the wake of revitalization strategies that include urban agriculture. Urban farming can transform empty or blighted lots, raise property values, reduce crime, provide a local source of income, and be a point of community pride. By teaming with local schools and youth organizations, urban agriculture can connect with those who will benefit greatly by learning to grow their own food.

Figure 2-20. Local Market (South Shore Park, Bay View)

2.3.5.3 Food Distribution

The Corridor area is fortunate to have a thriving market nearby as an outlet for produce distribution. The Vliet Street Greenway Market (in front of the Washington Park Senior Center) is open every Sunday from June to October and features locally grown produce and other foods, artisan crafts, demonstrations, and local entertainment. Most of the proceeds from the sales of products stay in the community.

2.3.5.4 Growing Milwaukee

From neighborhood community gardens to Will Allen's internationally renowned Growing Power, the City is proud to be involved with urban agriculture initiatives. The City supports urban agriculture through land sales, zoning and policy revisions, staffing, and material contributions. The goal is to improve access to fresh food for Milwaukee residents, beautify neighborhoods, build stronger communities, and create jobs.

Figure 2-21. Fresh Produce

2.3.6 Stormwater Facilities

Stormwater facilities are engineered facilities that are designed to convey stormwater runoff, remove pollutants, and control flow rates. These facilities include ditches, swales, and detention basins, and are specifically designed to capture, treat, store, and then slowly release stormwater runoff in to the proposed Greenway Corridor drainage way or into the existing sewers.

Figure 2-22. Detention Basin (Matteson, Illinois)

2.4 Corridor Elaboration

The formulation of a greenway that incorporates the required drainage infrastructure to address flooding and basement backup problems in the watershed, and includes a potential array of supporting features and elements, not only achieves the basic objectives of the project, but also provides opportunities to enhance and complement existing development and redevelopment of the area.

Serving as a spine of a drainage and trail system, the Greenway Corridor provides a continuous path of movement through the community. The experience of this pathway is enriched by the places and activities to which it connects. In some instances, the greenway runs through or is adjacent to existing public institutions, schools, playgrounds, and playfields, which expands and becomes an integral part of these places and creates easier and more attractive access. Through selective placement of complementary features and elements, it can provide an overall enhancement to existing social, recreational, and environmental opportunities of the area.

Figure 2-23. Artistic Representation of an Example Greenway (Source: Lafitte Greenway Master Plan, City of New Orleans, Louisiana)

Inversely, new developments can build on the value and assets offered by the greenway. New development will find it advantageous to connect to and elaborate the greenway by way of small semipublic transition spaces, such as courtyards, gardens, or terraces, allowing continuous pedestrian circulation from individual residential units into the greenway system and beyond to other recreational facilities and neighborhood places. The economic and social implications can be significant; properties that border on greenway spaces are more likely to increase in property value and more likely to be a source of pride for their inhabitants, which has been proven to be the case at many other locations.

Section 3
Greenway Corridor Concept Development

The Greenway Corridor concept location was developed based on the natural drainage flow path of the Corridor and a susceptibility-to-change analysis for the land use in the Corridor. The susceptibility-to-change analysis identified "Greenway Opportunity Areas" where existing development might benefit from an enhancement in value by its association with the Greenway Corridor.

An iterative process was used to develop the Greenway Corridor concept, which integrated the required drainage system needs with selected greenway characteristics and components to achieve the overall objectives and performance criteria established for the project. First, the required drainage improvements were defined to address area flooding problems. Second, specific non-drainage way components such as urban agriculture, vegetative buffers, and recreational fields were evaluated for inclusion into the Greenway Corridor concept. Finally, the drainage and non-drainage features were integrated to complement one another and form a recommended overall Greenway Corridor solution.

3.1 Drainage Backbone

The proposed solution to the surface water drainage problems and basement backups requires a set of infrastructure improvements to effectively manage surface water runoff in storage and conveyance facilities. This runoff could be conveyed in a series of storm sewers and open channels to outlet points where it would not create a problem. In keeping with the greenway vision for the Corridor area, a potential green drainage way that follows the low points in the watershed could provide the "green" component as well as serve as a major component of the required conveyance improvements, forming the backbone of an overall Greenway Corridor concept.

3.2 Greenway Corridor Location Selection

Identification of a potential Greenway Corridor location began with the existing surface drainage flow path in the Corridor. This simple understanding of where surface water flows during a major rainfall event provided an initial guide to where a green drainage way might be ideally located within the Corridor area. The overland drainage path, when combined with an assessment of the susceptibility-to-change of the adjacent land use, which can also be characterized as Greenway Opportunity Areas, is the basis for the iterative selection of the preliminary location of the Greenway Corridor.

Map Milwaukee data was used to categorize properties that were susceptible to change as defined by those properties that were owned by the City, properties that were tax delinquent, or properties that were in foreclosure (Milwaukee Assessor's Data, June 2013). These categories were chosen as a measure of a property's susceptibility-to-change, which was viewed as an opportunity for association with the Greenway Corridor. The areas included in this analysis were generally those within approximately two blocks of the existing surface drainage flow path. If one-third or more of the properties on any given block face were identified in any of the three categories, the block face was identified as susceptible to change. The susceptibility- to-change criterion for the North Corridor area, which is dominated more by non-residential land use, was modified slightly to consider properties that were vacant, for sale, or City-owned.

By their nature and location, these areas offer opportunities for relatively easy association with the Greenway Corridor. They can be considered "Greenway Opportunities" because of their potential to be incorporated into the greenway area redevelopment or because of their potential to benefit from direct linkage with the Greenway Corridor. Over time, these areas are likely to realize enhanced economic value

associated with new ownership and new redevelopment. **Figure 3-1** illustrates these Greenway Opportunity Areas.

Properties characterized as major neighborhood institutions were identified and considered off-limits as greenway areas. These properties were deemed as key to neighborhood stability with high value to the social fabric of the community. These neighborhood institutions are regarded as activity centers that could benefit by being proximate to the new Greenway reinforcing the connectivity of the neighborhood. Several MPS facilities and community churches are included in this classification as shown in **Figure 3-1.**

The initial preliminary Greenway Corridor location was verified by field reconnaissance and input from stakeholders to make adjustments based on recent changes in land use or redevelopment, and to minimize potential impacts to existing viable properties.

The Greenway Corridor drainage way location selected from this analysis is preliminary and is subject to continuous change from ongoing property transactions, further planning and analysis, and community input. However, this initial location provides a reference for locating the Greenway Corridor, and a basis for proceeding with the hydrologic and hydraulic analysis, component sizing, and preliminary cost projections. This initial location also provides an opportunity to examine how the Greenway Corridor, as a new neighborhood amenity, can provide further impetus for neighborhood redevelopment and investment.

Note: The Greenway Opportunity Areas are not intended to indicate a specific or final location of the Greenway Corridor, and do not represent an inventory of property to be acquired. Rather, they represent areas for redevelopment and other investment opportunities that would be associated with the Greenway Corridor.

Figure 3-1. Greenway Opportunity Analysis

3.3 Existing Anchors/Institutional/Investments

Although founded on the residences and workplaces in the area, all urban neighborhoods are structured around nearby social and cultural institutions. The neighborhoods on the west side of Milwaukee are no exception. The proposed Greenway Corridor provides pathways to and connectivity between these facilities, and will leverage the opportunities they offer. The Greenway Corridor study area is home to the following schools, churches, and community organizations.

Clarke Street School at 2816 W. Clarke Street is an MPS kindergarten through 8th grade school with an enrollment of 430 students.

The Helwig Family Community Center is located at 2549 N. 29th Street. In 1992, the community center became the home of Next Door Foundation. Since 1998, Next Door has offered a kindergarten and pre-kindergarten Head Start program, and is licensed for 390 children. They are a local resource for autism family counselors in the City, as well as offering other family counseling.

Frances Brock Starms Early Childhood Center is located at 2616 W. Garfield Avenue. It is a MPS facility serving kindergarten through fifth grade with 302 students.

Starms Discovery Learning Center is located at 2035 N. 25th Street. The school is an ungraded elementary and middle school with students aged six to 14 years old, with an enrollment of 451 students.

Figure 3-2. Clark Street School Neighborhood

Figure 3-3. Frances Brock Starms Early Childhood Center Neighborhood

Figure 3-4. Starms Discovery Learning Center

Two major church structures are also located along the Greenway Corridor drainage way: Hopewell Missionary Baptist Church, located at 2375 N. 25th Street, and Damascus Missionary Baptist Church, located at 2447 N. 27th Street. Several government facilities are located in proximity to the Greenway Corridor: the Fire Station near N. 30th Street and W. Locust Street, and the State of Wisconsin Chaney Correctional Center is at 2825 N. 30th Street.

Figure 3-5. Chaney Correctional Center at N. 30th Street and W. Fond du Lac Avenue

3.4 Greenway Corridor Solution

The Greenway Corridor solution was developed in an iterative process to integrate the required drainage system needs with selected greenway characteristics and components to achieve the overall objectives and performance criteria established for the project.

3.4.1 Drainage Components

The Corridor area is comprised of two watersheds: the North and the South Corridor watersheds, which have specific drainage problems and require different drainage solutions. The North Corridor drainage solution components are proposed to mitigate the damages associated with significant surface flooding problems, while the South Corridor components are proposed to prevent widespread basement backups and surface flooding problems. **Table 3-1** summarizes the drainage system components of the solution for both the North and South Corridor watersheds. **Figure 3-6** presents the Corridor drainage solution components.

The proposed drainage system solution for the North Corridor consists of three stormwater storage basins and supporting storm sewer construction as shown in **Figure 3-6**. These improvements will provide additional flow and storage capacity to the existing storm sewer system and minimize street flooding. The three proposed detention basins provide capacity for 32 million gallons of storm water storage. One of the basins includes a bioretention area to provide pollutant removal prior to discharging to Lincoln Creek. Drainage improvements in the North Corridor are summarized in **Table 3-1**.

The proposed drainage solution for the South Corridor is comprised of street inlet restrictors, stormwater storage basins, storm sewer conveyance, the Greenway Corridor drainage way, and associated GI.

The proposed drainage system solution is developed to retain and manage stormwater on the surface reducing the volume that enters the combined sewer system by selectively installing flow restrictors in street inlets and catch basins across the watershed. Restricting the amount of stormwater that enters the combined sewer system reduces system flows, thereby reducing surcharging and basement backups. Inflows to the combined system can be controlled by restrictors in the street inlets that retain stormwater on the streets and prevent it from entering the underground pipe system. Retained surface flow becomes overland flow on the streets that must be effectively managed and contained without causing surface flooding problems. Street flow is routed down the street system to proposed storm sewers, six stormwater storage basins, and the Greenway Corridor drainage way which serves as the primary component of the proposed Greenway Corridor. The drainage way is generally located in the topographical low area of the watershed and would convey stormwater south to W. Vliet Street. and N. 27th Street, where stormwater would be captured by a proposed storm sewer that would convey the flow to the Menomonee River.

Table 3-1. Summary of Drainage System Solution Components

Drainage Component	Description
Inlet Restrictors	5,000 street inlet restrictors placed in selected subbasins (South Corridor)
Stormwater Storage	52.2 Million Gallons (MG) of stormwater storage at nine locations in South and North Corridors
Drainage Way	13,500 feet (or 2.6 miles) of drainage way from W. Auer Avenue to W. Vliet Street (South Corridor) including roadway crossings at 20 locations
Stormwater Conveyance	7,000 feet of 72- to 144-inch storm sewer from the south end of the drainage way at W. Vliet and N. 27th Street to the Menomonee River (South Corridor) 2,200 feet of 24-inch storm sewer for street flow relief in the W. Center Street and N. 32nd Street area (South Corridor) 1,500 feet of 5.5- x 8.5-foot box culvert from the intersection of N. 35th Street and W. Capitol Drive to the Bee Bus Storage basin near Lincoln Creek (North Corridor) 1,200 feet of 5- x 8-foot box culvert from N. 27th Street and W. Hope Avenue to the DRS East Basin (North Corridor) 965 feet of 4- x 6-foot box culvert connecting the East Basin to the North Basin (North Corridor)

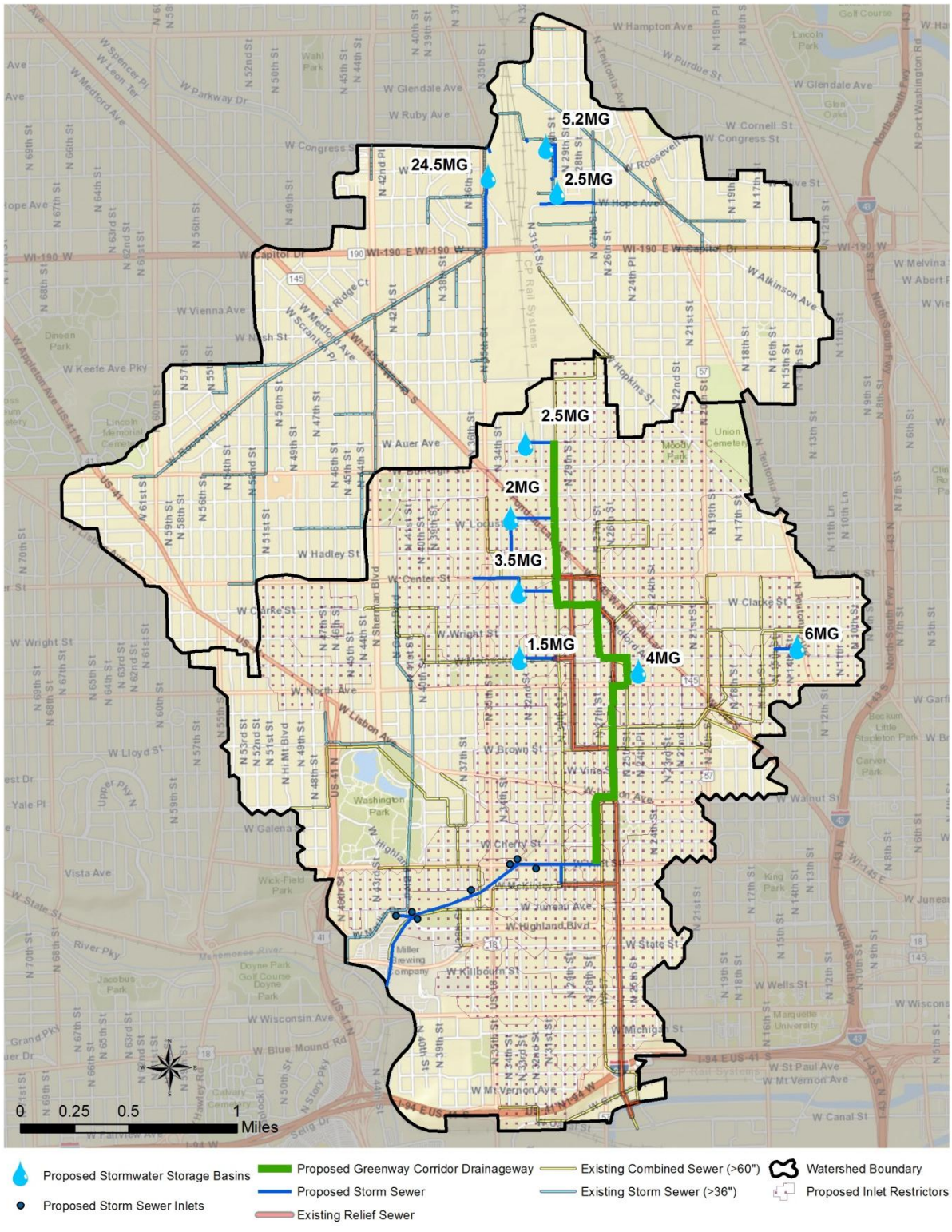


Figure 3-6. Corridor Drainage Solution Components

3.4.2 Greenway Components

An urban greenway provides the opportunity for many additional benefits beyond a drainage solution to surface flooding and basement backup flooding problems. An urban greenway can also complement the adjacent neighborhoods, provide specific elements to strengthen the local social fabric of the area, and greatly enhance the value of that portion of the Corridor area.

Definition of the appropriate features and elements of the Greenway Corridor began with four fundamental components:

- A drainage channel
- A landscaped strip of land
- A continuous path or trail for recreational and transportation use
- A continuous vertical identity of the Greenway Corridor marked with vegetation

Specific features and elements were added to these fundamental components based on the identified opportunities and needs of individual blocks or segments of the Greenway Corridor.

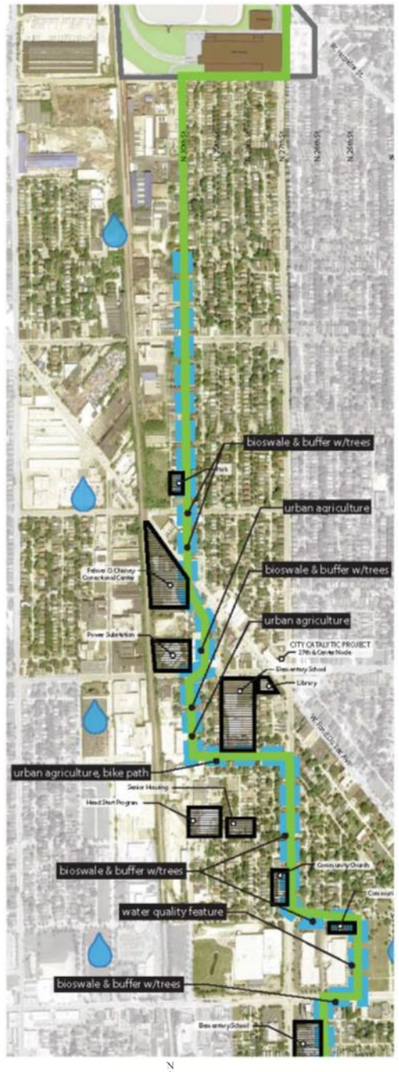
The concept of greenways is certainly not unique; it has been used extensively in many communities in the United States, including the renowned plan layout of Greendale, WI, and the much acclaimed environmentally progressive redevelopment of the Menomonee Valley. The overall concept of the Greenway Corridor is shown in **Figure 3-7**. The Greenway Corridor location is conceptual and generally shown down the centerline of the street from north to south. However, the final location of the Greenway Corridor will be on one side or another of the street based on the specific characteristics of the block, known development opportunities, drainage requirements, and the unique needs of the adjacent neighborhood.

As the Greenway Corridor drainage way winds its way from north to south, land uses vary along its edges. While the drainage and trail components provide a consistent framework for the Greenway Corridor, the landscaping in particular can provide multiple opportunities to flexibly address and adjust to local conditions. Landscape strategies combined with stormwater BMPs for any particular block will vary and therefore provide richness and variety that will allow the Greenway Corridor to visually transform the adjacent neighborhood settings.

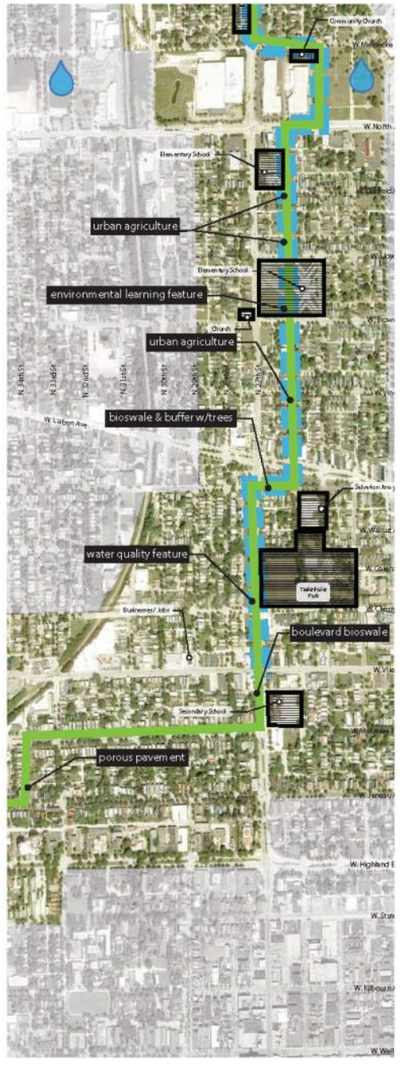
A number of elements were considered to be incorporated with the drainage way within the Greenway Corridor. Potential elements included bike paths, vegetated buffers, GI Best Management Practices (BMP), urban agriculture, etc. These elements, combined with drainage requirements and preferences of the Stakeholder Group, form the preliminary Greenway Corridor concepts by segment along the Corridor. Incorporation of these elements was considered on a reach-by-reach basis depending on the specific needs and opportunities associated with each reach.

W. Congress Street to W. Townsend Street

W. Townsend Street to W. North Avenue



W. North Avenue to W. Highland Boulevard



W. Highland Boulevard to W. Wisconsin Avenue

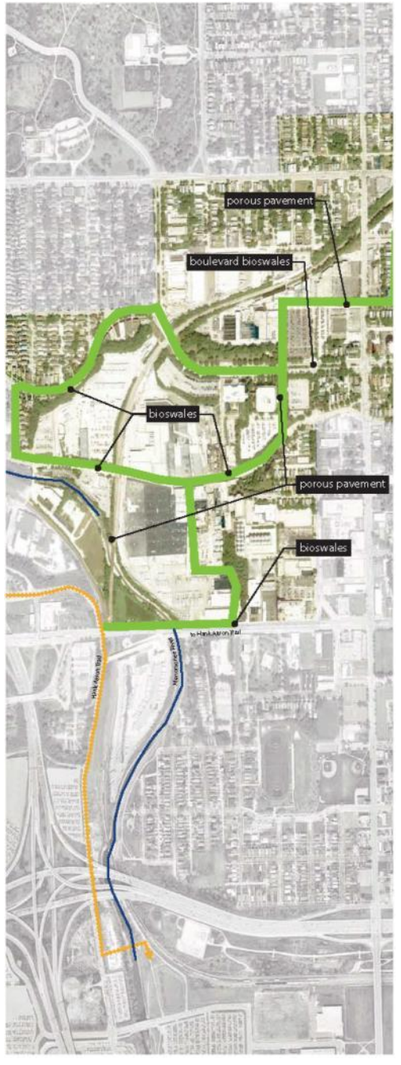


Figure 3-7. Overall Concept of the Greenway Corridor

N. 30th Street: W. Congress Street to W. Townsend Avenue

The north Greenway Corridor segment will be linked eastward to the Oak Leaf bicycle trail and all the adjacent neighborhoods and park amenities. The trail weaves through by way of city streets, including W. Roosevelt Drive, creating a new and dynamic set of connections. At N. 30th Street, the bike trail turns south between a newly landscaped edge along the DRS manufacturing facility and a planned stormwater storage basin on the east. **Figure 3-8** shows the artistic layout of DRS' north and east stormwater storage facilities.

At W. Hope Avenue, the greenway and trail will shift over to N. 31st Street and extend to W. Capitol Drive. This north segment will run through a planned urban industrial park, known as Century City II. As Century City II moves forward, it will be important to consistently provide space for continuity of the bike trail and reinforce its identity with tree planting and landscaping. Stormwater management in this area will likely include strategically located GI bioswales but should also visually support the Greenway Corridor concept as a neighborhood amenity.

South of W. Capitol Drive and west of W. Hopkins Street is Century City I. Recent focused economic development efforts by the City have stimulated business development interest in this area. The City has secured an Economic Development Administration (EDA) grant to build a green edge along W. Hopkins Street, which will initiate construction of the first leg of the Greenway Corridor. Plans call for a continuous bike trail/walkway from W. Capitol Drive and N. 31st Street south to N. 27th Street. This greenway connector will be enhanced by trees planted on both sides of the trail and aligned at 40 feet on center. Additional low landscaping with an urban character is planned at the property line edge to mitigate changes in topography and screen potential industrial uses. Special design elements along this greenway will include a Century City I sign at the southwest corner of N. 31st Street and W. Capitol Drive along with a small landscaped stormwater basin. A second, larger landscaped stormwater basin supporting the new business park development is planned to the south along the west side of W. Hopkins Street. Near this basin, a formal business park driveway will cross the Greenway Corridor and enter W. Hopkins Street. This entry will receive additional signage and entranceway design elements.

Figure 3-8. Artistic Layout of DRS North and East Stormwater Storage Basin

From the corner of N. 27th Street and W. Townsend Avenue, the greenway would extend west to N. 30th Street as a bike trail on the north side of the street. The sidewalk in that area runs along the Talgo industrial facility and has little pedestrian circulation. The bike trail would share that space and this linkage would be redeveloped as permeable pavement.

N.30th Street: W. Townsend Avenue to W. Clarke Street

Along N. 30th Street from W. Townsend to W. Clarke, the Greenway Corridor will largely provide a buffer between existing industrial land on the west and residential neighborhoods on the east. The width of the Greenway Corridor drainage way may vary depending on surface drainage requirements and available property. Drainage on some blocks with lower flows might be handled "on-street" with stretches of permeable pavement; other blocks may require space for bioswales. The west side sidewalk may be widened to accommodate bicycles since little pedestrian activity occurs along the industrial edge. The industries here typically fence the perimeter of their property. The landscaping in this segment should visually screen the industrial uses from the neighborhood with trees and shrubs where feasible. **Figure 3-9** illustrates a conceptual cross section view cut through this segment, which portrays the concept of the Greenway Corridor as a buffer.

Figure 3-9. Conceptual Greenway Corridor Cross Section View on 30th Street from W. Townsend Avenue to W. Clark Street

W. Clarke Street: N. 30th Street to N. 27th Street

Wherever possible, the Greenway Corridor will follow along the edges of the streets. At some block faces along N. 30th Street, the Greenway Corridor may move to the residential side of the street. Along W. Clarke from N. 30th to N. 27th Street, the Greenway Corridor's adjacency to residential properties provides for, and requires, a different design response. With the drainage channel generally in the middle of the proposed greenway, the street edge space is typically indicated for the public recreation bike trail. Based on lot depths, the drainage way may leave remnant areas of open land sufficient for neighborhood garden plots or other neighborhood amenities. While the Greenway Corridor can generally be described as public recreation space, a neighborhood gardens component may encourage neighborhood stewardship to any portion utilized for individual gardens. Care and maintenance for these areas may be assigned to local garden organizations or block clubs. This side of the drainage way channel would provide a more protected

zone where the public garden plots can be maintained as semi-public/semi-private territory that is more defensible by the gardeners. These gardens can provide an opportunity for social connectivity: a pleasing meeting ground for neighbors, as seen in **Figure 3-10**. Tree planting in this segment should occur only to the north of the garden plots allowing for plenty of southern sun for gardening.

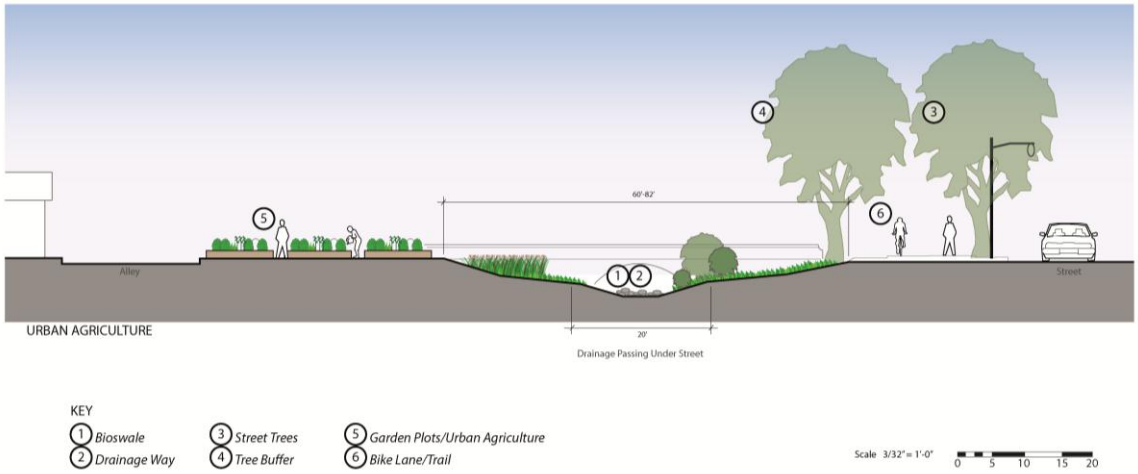


Figure 3-10. Conceptual Greenway Corridor Cross Section View on W. Clark Street from N. 30th Street to N. 27th Street

This segment also provides a trail connection to MPS's Clarke Street School. The new public greenway can become a walking and biking route for students traveling to their neighborhood school for classes and events. One concept for a portion of the greenway adjacent to the school might be a Will Allen Growing Power demonstration hoop house. The concept represents a creative elaboration of the greenway's programming beyond the basic concept which is to be encouraged, as shown in **Figure 3-11**.

Figure 3-11. Will Allen Growing Power Demonstration Hoop House (Milwaukee, WI)

N. 27th Street: W. Clarke Street to W. Meinecke Avenue

In this neighborhood, N. 27th Street is a major traffic arterial and a state highway to the south. Investors spoke of the difficulty to rent existing housing along this busy street. At W. Clarke Street, the Greenway Corridor drainage way would turn south down N. 27th Street, and would serve to reimage the neighborhood to the west and to the east as it crosses to the east side a block north of W. Meinecke Avenue. These Greenway Corridor segments are pictured as linear passive recreation parks. The outside edge again maintains the trail linkage while the inside edge could again provide space for garden plots, small play areas, and other neighborhood amenities maintained by local residents. As shown in **Figure 3-12**, the Greenway Corridor can transform the image of this segment of N. 27th Street.

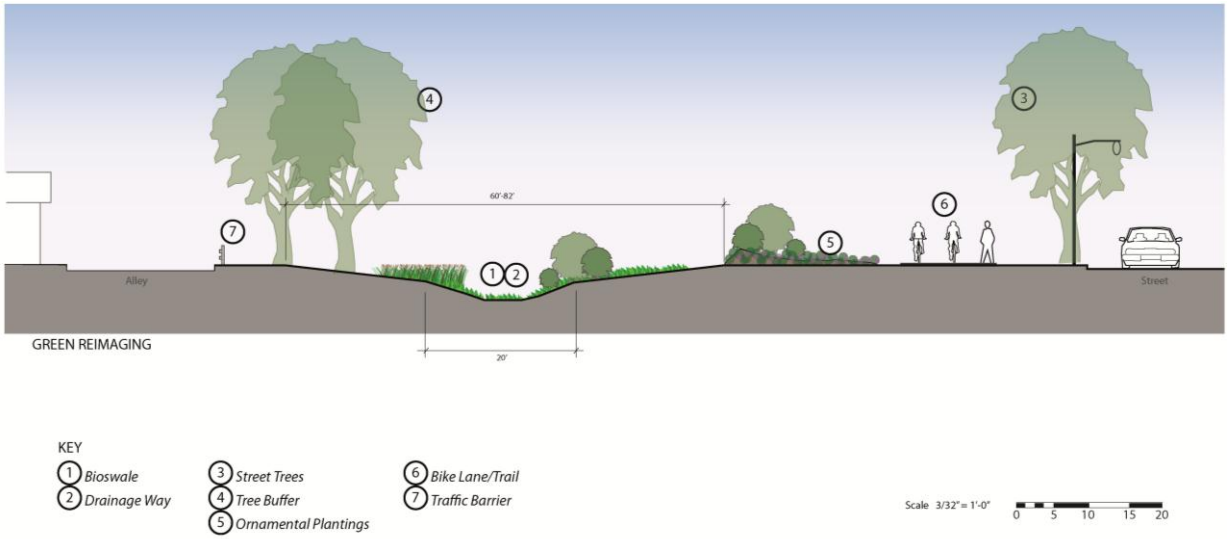


Figure 3-12. Conceptual Greenway Corridor Cross Section View on N. 27th Street from W. Clark Street to W. Meinecke Avenue

W. Meinecke: N. 27th Street to N. 25th Street

Turning east at W. Meinecke Avenue, the Greenway Corridor would again take on similar characteristics to those described for W. Clarke Street with a street edge bike path, drainage way, and, depending on width of Greenway Corridor parcels, the potential for neighborhood garden plots or other neighborhood amenities adjacent to the residential lots, as shown in the example in **Figure 3-13**.

Figure 3-13. Example of Garden Plots

N. 25th Street: W. Meinecke Avenue to W. North Avenue

To the east of N. 25th Street, a wet pond is required to store excess stormwater runoff that has been restricted from the combined sewer system. This pond or storage basin can become a landscaped feature in the neighborhood around which redevelopment could cluster. Between W. Meinecke Avenue and W. North Avenue on the east side of the street, a new multi-generational residential development is planned. A connection to the Greenway Corridor trail can be integrated into this development's site plan.

Figure 3-14. Example of Environmental Learning Site (Urban Ecology Center, Milwaukee)

N. 25th/26th Streets: W. North Avenue to W. Lisbon Avenue

The Greenway Corridor crosses W. North Avenue at N. 25th Street. The route then turns west to N. 26th Street. This short segment can be emphasized as a buffer to the residential neighborhood to the south from the busy W. North Avenue, as well as a portal or transition to the greenway as it heads south at N. 26th Street. The

plantings in this segment are pictured as trees, shrubs, and perennials providing an attractive visual effect along W. North Avenue.

Moving south along N. 26th Street, the Greenway Corridor can become a linear green space, tree-lined with a central landscaped drainage channel and shoulder green space suitable for garden plots, small play grounds with play equipment or other neighborhood amenities, and perennials. It can be designed as a seam in the neighborhood fabric where neighbors can come together and enjoy use of a common ground. Some recent residential redevelopment has occurred in this area with more than a few Habitat for Humanity homes completed. The Greenway Corridor can reinforce the community building spirit both north and south of the MPS Starms School site.

The Greenway Corridor will provide pleasant connections between the MPS Starms School, the N. 27th Street School, and the neighborhood surroundings from W. North Avenue to W. Lisbon Avenue. Greenway trails on Milwaukee's eastside and in the Menomonee Valley have germinated environmental learning programs, such as the UEC. A similar program in a special outdoor environmental learning setting might be possible in collaboration with MPS as the Greenway Corridor intersects with the Starms School site, as shown in **Figure 3-14**.

W. Lisbon/N. 27 Street: N. 26th Street to W. Vliet

The Greenway Corridor will cross W. Lisbon Avenue and shift westward across N. 27th Street. This is a segment with high visibility and public exposure. A designated bike route on W. Lisbon Avenue crossing the bike trail of the Greenway Corridor could be located here, and a rest area with map and public information on the Greenway Corridor. Similar to the W. North Avenue crossing, the plantings in this segment are proposed as trees, shrubs, and perennials, providing an attractive visual event at the corner of W. Lisbon Avenue and N. 27th Street.

From W. Lisbon Avenue south to W. Vliet Street, the Greenway Corridor would occupy remnant parcels left from the widening of N. 27th Street. Drainage requirements in this area anticipate the need for additional stormwater storage in this segment. With the appropriate hydrology, constructed wetlands are proposed within the area west of N. 27th Street to the adjacent north-south alley. These would occur in three segments: W. Walnut to W. Galena, W. Galena to W. Cherry, and W. Cherry to the alley north of W. Vliet. The concept is to provide stormwater storage and delay its entry into the proposed storm sewer system, and these three connected terraced basins would provide that delay. The street edge would provide for the continuous Greenway Corridor pedestrian/bike trail. The trail might need to cantilever over the storage basin to increase its capacity. The alley edge would be landscaped, lined with trees, and edged with a traffic barrier to protect vehicles from driving into the basin, similar to the stormwater improvements utilized in the Menomonee Valley shown in **Figure 3-15**.

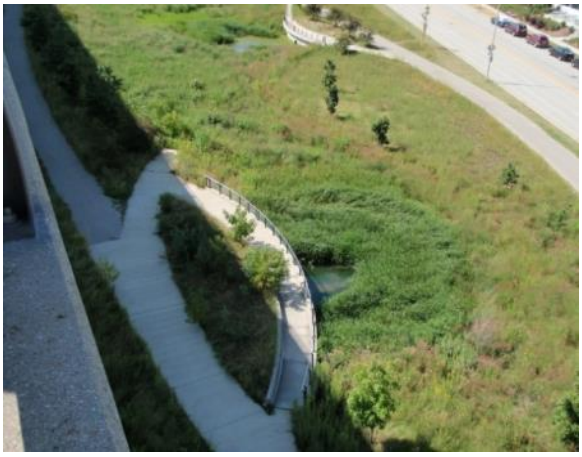


Figure 3-15. Mini Natural Habitat of Native Grasses within the Urban Environment

Similar protection would likewise be needed at the north and south ends of these basins. Plantings of native grasses and other vegetation can provide a mini oasis of flora and fauna habitat in the midst of the urban environment, not unlike the concept shown in **Figure 3-16**.

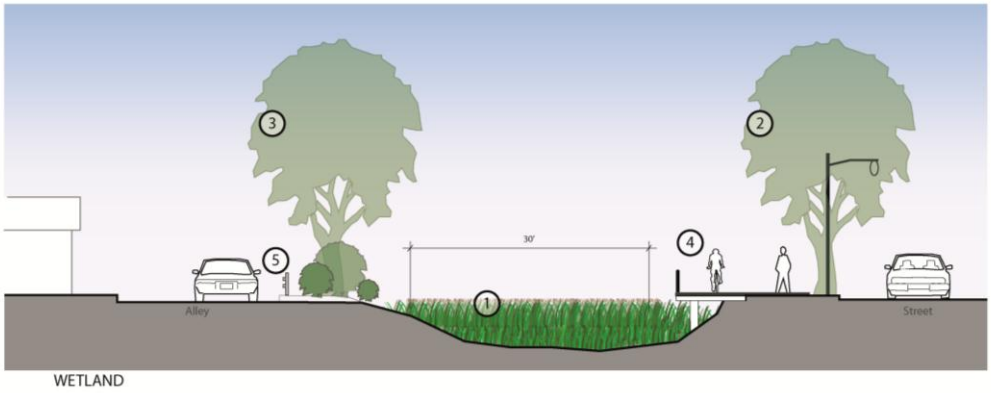


Figure 3-16. Conceptual Greenway Corridor Cross Section View on N. 27th Street from W. Lisbon Avenue to W. Vliet Street

W. McKinley Boulevard: N. 27th Street to N. 34th Street

The surface drainage component of the Greenway Corridor would stop just north of W. Vliet Street. Outflows from the basins would move water underground through a proposed storm sewer and west to the N. 30th Street railway corridor. The bike trail would continue south about one block to W. McKinley Boulevard, which is part of a historic residential district and would proceed on the street seven blocks west to N. 34th Street. The center boulevard along W. McKinley would be retrofitted between the large mature trees with bioswales to help manage stormwater runoff, as shown in **Figure 3-17**.

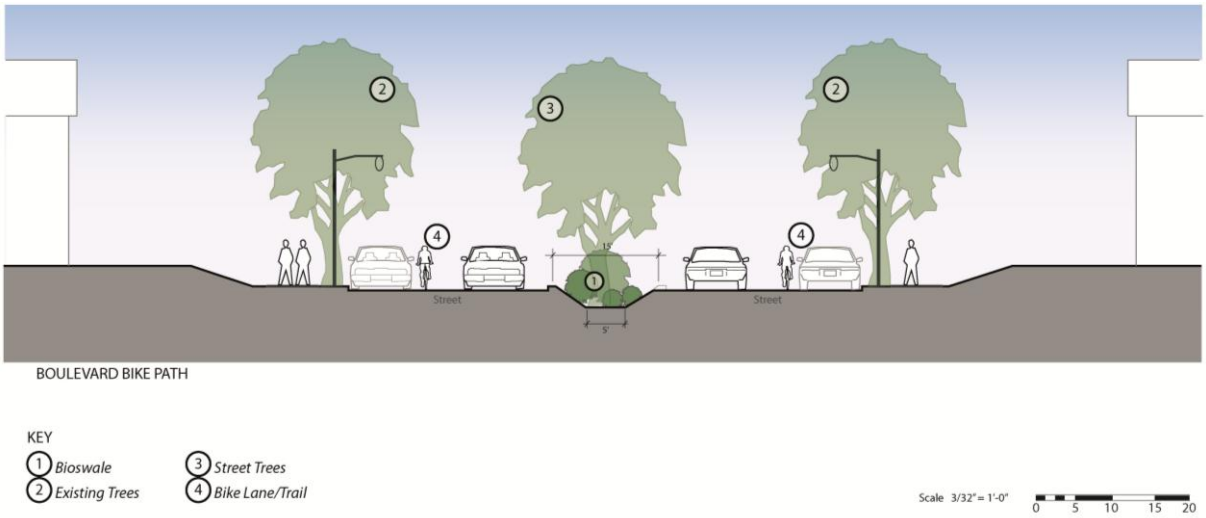


Figure 3-17. Conceptual Greenway Corridor Cross Section View on W. McKinley Boulevard from N. 27th Street to N. 34th Street

N. 34th Street to the Hank Aaron State Trail

Turning south on N. 34th Street for a block, then west on W. Juneau Avenue, the Greenway Corridor enters the Harley-Davidson campus at N. 37th Street. The permeable pavement trail turns south at N. 37th Street, then south to W. Highland Boulevard, again being retrofitted with bioswales between mature trees. At this point, the bike path divides into two branches. One branch moves west through the MillerCoors campus to W. Juneau Avenue at W. Martin Drive, then W. Martin Drive to N. 46th Street, then south to W. State Street, and back to N. 41st Street. The second branch continues on N. 37th Street to W. State Street, then west to N. 41st Street. The bike loop closes at N. 41st Street then continues south to W. Wisconsin Avenue. Proceeding west on the W. Wisconsin Avenue bridge across the Miller Valley, the trail intersects with the Hank Aaron State Trail. This bike trail segment traverses interesting terrain with historic structures and culturally prominent industrial sites.

3.4.3 Greenway Corridor Drainage Way and Functionality

The Greenway Corridor drainage way is approximately 2.5 miles long and begins at W. Auer Avenue and extends to W. Vliet Street in the South Corridor area. At W. Vliet Street, the drainage way discharges to the proposed storm sewer that runs along the railroad corridor right-of-way (ROW). The drainage way location, capacity and geometry are based on the receiving flows from the proposed flood storage basins, street flow and overland flow from areas adjacent to the drainage way. The drainage way carries a maximum peak flow of 300 cubic feet per second (cfs). **Table 3-2** summarizes the conceptual design parameters for the drainage way.

The proposed drainage way has an extremely flat slope in order to minimize cuts, retaining walls, and the required top width. Because of the flat, longitudinal slope, the drainage way is expected to hold significant stormwater storage, but still be able to drain from north to south. The drainage way bottom will include an underdrain pipe to facilitate draining the stormwater from the bottom in spite of the flat longitudinal slope. Roadway crossings will be defined in future planning efforts and will be based on the flow capacity of two 10-foot by 6-foot culverts.

Table 3-2. Conceptual Drainage Way Geometry Details

Geometry Parameter	Value
Typical Bottom Width	20 feet
Side Slopes	1:4 [H:V]
Maximum Water Depth	5 feet
Top Width	60 - 82 feet
Profile Slope Along Centerline: W. Auer Ave. to W. Locust St.	0.0015 feet/feet
Profile Slope Along Centerline: W. Locust St. to W. Vilet St.	0.0001 feet/feet
Channel Bottom Cross Slope	1:15 [H:V]
Equivalent Culvert Size	2 (10 x 6) feet

The drainage way will see at least minor flows on the average of once every year, but will not have flowing water for most rainfall events, significant flows will be infrequent. For typical annual events, depths would be expected to be two feet or less. For the design event, the one percent annual exceedance probability storm event, depths are expected to be in the five- to six-foot range with velocities less than two feet per second (fps). In general, the Greenway Corridor drainage way will be dry the majority of the time. **Figure 3-18** shows the depth of water in the drainage way for the typical and design rainfall events.

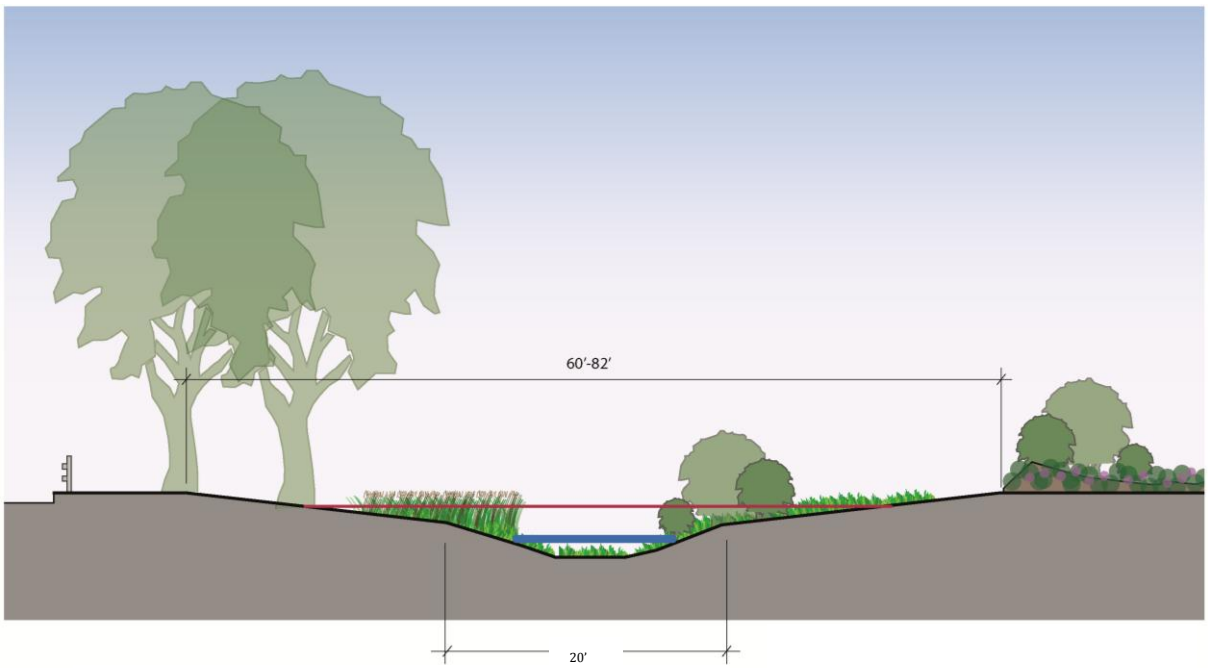


Figure 3-18. Conceptual Greenway Corridor Cross Section View with Water Depths (feet) for Different Rainfall Events

Section 4
A Catalyst for Re-Imagining the Corridor

4.1 Greenway Corridor Benefits and Value

The Greenway Corridor offers many primary and secondary benefits for not only those living immediately adjacent to the Greenway Corridor, but also to the residents of the entire Corridor area. GI, drainage improvements, environmental attributes, recreational features, and green open space all add value to the area. These improvements establish potential enhancement opportunities for economic growth—including job creation and workforce development—environmental awareness, and positive social well-being. Measurable benefits can be realized not only for both near-term catalytic-type projects, but also in terms of the long-term revitalization of the Corridor area.

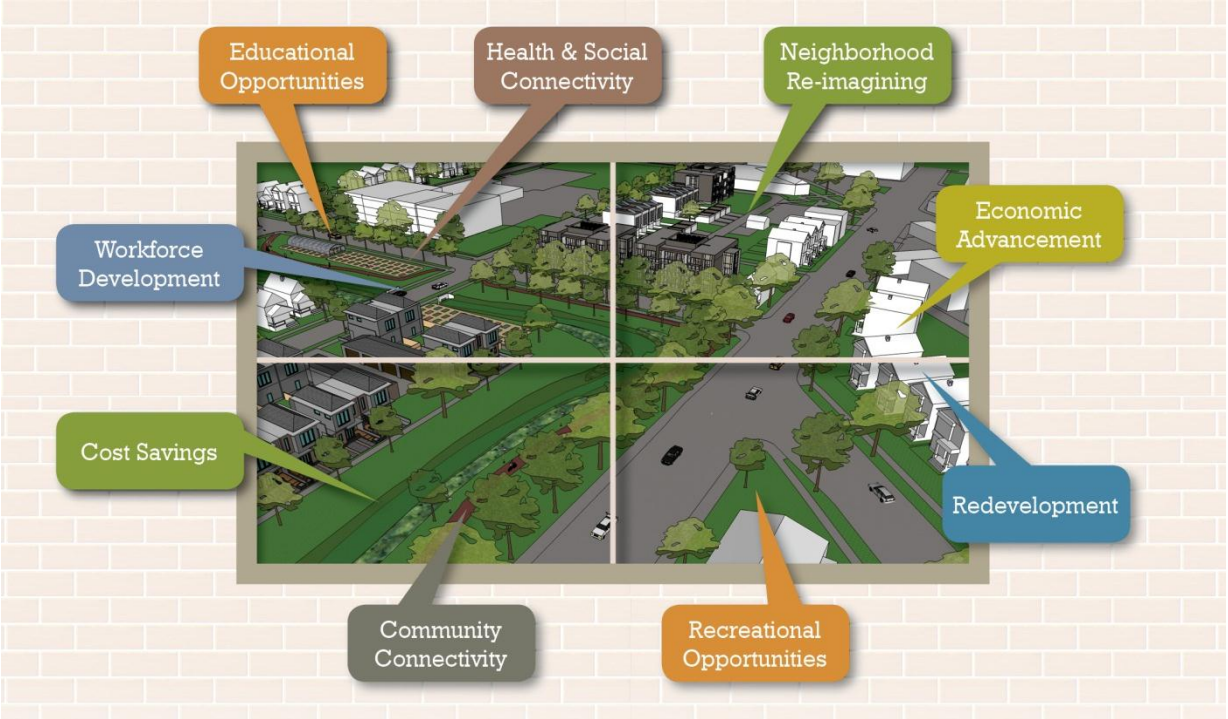


Figure 4-1. Greenway Corridor Benefits and Value

4.1.1 Environmental Enhancements

Environmentally, the Greenway Corridor will greatly reduce if not eliminate basement backups in the adjacent neighborhoods. The associated greenway infrastructure will also reduce CSOs, reducing pollution and assuring cleaner water in the City's rivers and Lake Michigan. Landscaping and planting will also increase the neighborhood's tree canopy area, reversing a period of decline, and contributing to reduce the urban heat island effect, thus helping to moderate local summer temperatures. Trees planted in the Greenway Corridor will help to clean and oxygenate the air and improve air quality.

4.1.1.1 Abandoned Site Clean-up

Although the corridor has 513 acres of industrial zoned land, roughly half of that land is vacant and/or classified as brownfield and expensive to redevelop. In the past five years, the City has been working to prepare the Corridor area for redevelopment and revitalization, and has made significant progress working with the EPA to mitigate brownfields, but there are additional challenges. The former Tower Automotive/A.O. Smith (Century City) manufacturing complex is a vacant 84-acre industrial site on the northern end of the Corridor, and is the largest brownfield in the State of Wisconsin. It is currently the largest environmental and economic development undertaken by the City. The site has been cleaned up and the City is in the process to redevelop the site with manufacturing and light manufacturing employers, with a goal of creating up to 1,000 jobs for local residents.

Figure 4-2. Proposed Century City I Redevelopment

4.1.1.2 Water Quality Benefits to Receiving Waters

The Greenway Corridor improvements provide several water quality benefits to the receiving waters. CSO volumes to the Menomonee River and Lincoln Creek will be reduced by 20 to 30 percent. Individual event overflow volumes are estimated to be reduced by 20 million gallons for small overflow events and as much as 90 million gallons for an extreme rainfall event. CSO volume reductions may be further optimized or enhanced by additional analysis as the project moves forward into design. The combined sewer system discharges into MMSD facilities for treatment at the Jones Island Water Reclamation Facility (JIWRF). With the proposed Greenway Corridor improvements in place, the typical wet weather combined sewer volume to MMSD facilities from the South Corridor drainage area will decrease by 15 to 20 percent, reserving more capacity in MMSD facilities for the discharges from other MMSD watersheds.

The Greenway Corridor improvements will result in a net increase in pervious area of approximately 65 acres. Under existing conditions for the South Corridor drainage area, the street runoff is discharged into the combined sewers and is treated by JIWRF. Under the proposed conditions, the majority of the street runoff would be discharged into the storage basins and the Greenway Corridor drainage way and ultimately to the Menomonee River. The proposed water quality features for the stormwater storage basins and the drainage way will provide water quality improvements to the street runoff before discharging into the local receiving waters.

4.1.2 Neighborhood Re-Imagining

The Greenway Corridor will significantly increase open greenway space in a part of the City that historically was densely developed, and lacks park and playground space. Where the Greenway Corridor parallels major streets, the noticeable impact will be transformational with century old detached wooden residential structures replaced by a continuous greenway trail. Along neighborhood streets, the greenway will serve to open up the tightly formed streets offering neighborhoods green space relief from the appropriately dense urban pattern. The impact will be visually dramatic, yet complementary and beneficial to the area.

Figure 4-3. Artistic Representation of Potential Greenway Corridor Features in the South Corridor Area

4.1.3 Health and Social Connectivity

The Greenway Corridor will provide opportunities for recreational and productive physical activity. Strolling, jogging, skating, and biking are all exercise options afforded by the Greenway Corridor. Gardening provides the opportunity for fresh vegetables, encouraging local residents to control the food supply and its quality. A further key component of health is social connectivity. Socially, the Greenway Corridor will add local gathering places, walks, play areas, and gardens not currently present. These social opportunities will attract all age groups from children to seniors. Local "grassroots" organizations will be formed or strengthened based on mutual community interests to foster neighborhood networks and improve safety, security, and pride in neighborhood identity.

4.1.4 Community Connectivity

The Greenway Corridor provides the opportunity for community connectivity beyond the local neighborhood. The Greenway by definition will provide a soft traffic connection for human-powered transport to the broad spectrum of local institutions, parks and river parkways, and recreational, commercial, and cultural sites. It will no doubt also function as a commuting-to-work route for some. Decades after local government promoted the "76 Bike Trail" circumscribing Milwaukee County for the country's 200th birthday, this Greenway Corridor proposes to connect Corridor neighborhoods to that route at the north end by way of the Oak Leaf Trail and at the south end as it branches off of the Hank Aaron State Trail.

4.1.5 Crime Reduction

Access to public parks and recreational facilities has been strongly linked to reductions in crime and in particular to reduced juvenile delinquency. Recreational facilities keep at-risk youth off the streets, give them a safe environment to interact with their peers, and fill up time within which they could otherwise get into trouble (The Benefits of Parks: Why America Needs More City Parks and Open Space, 2003).

In Fort Myers, Florida, police documented a 28 percent drop in juvenile arrests after the city began the STARS (Success through Academics and Recreational Support) Program in 1990. Fort Myers built a new recreation center in the heart of a low-income community to support STARS. Young people's school grades also improved significantly. Importantly, building parks costs a fraction of what it costs to build new prisons and increase police-force size (The Benefits of Parks: Why America Needs More City Parks and Open Space, 2003).

Many communities have reported success with "midnight basketball" programs, keeping courts open late at night to give youths an alternative to finding trouble. Over a one-year period, Kansas City reported a 25 percent decrease in arrests of juveniles in areas where midnight basketball programs were offered. In Fort Worth, Texas, crime dropped 28 percent within a one-mile radius of community centers where midnight basketball was offered. In the areas around five other Fort Worth community centers where the programs were not offered, crime rose an average of 39 percent during the same period (The Benefits of Parks: Why America Needs More City Parks and Open Space, 2003).

Research supports the widely held belief that community involvement in neighborhood parks is correlated with lower levels of crime. The Project on Human Development in Chicago Neighborhoods studied the impact of "collective efficacy," which it defined as "cohesion among neighborhood residents combined with shared expectations for informal social control of public space." The study found that "in neighborhoods where collective efficacy was strong, rates of violence were low, regardless of sociodemographic composition and the amount of disorder observed. Collective efficacy also appears to deter disorder: Where it was strong, observed levels of physical and social disorder were low (The Benefits of Parks: Why America Needs More City Parks and Open Space, 2003).

4.1.6 Economic Advancement

Economically, the Greenway Corridor will add value in views and recreational amenities to positively impact adjacent and nearby property values. These are typical considerations and incrementally increase property appraisals, building equity for local property owners and increasing the tax base for the City. The Greenway also positively affects pride of ownership for adjacent property owners, encouraging long-term investment in these properties and, in turn, further increasing the City's tax base. For the urban gardeners, annual food costs can be reduced and greenway maintenance will provide meaningful employment for some. Corridor improvements will contribute to both short-term and long-term job creation, with economic advancement helping to fuel redevelopment and increased value across the Corridor.

At the macro scale, an investment of the magnitude of the Greenway Corridor in this neighborhood is a once-in-a-century opportunity that provides an unparalleled investment in the area that can be leveraged for significant, long-term economic benefits.

4.1.6.1 Increased Property Values

Studies show that greenways and trails have a proven positive impact on property values. For example, a study of the impacts of "greenway belts" on neighborhood property values in Boulder, CO, revealed the aggregate property value for one neighborhood was approximately $5.4 million greater than if there had been no greenway belt constructed. This results in approximately $500,000 of additional property tax revenue for the City of Boulder (National Park Service, 1995).

Case studies provide a range of increased value that greenways can bring to adjacent property. Notable facts for successful greenways include:

- The preponderance of studies has revealed that excellent parks tend to add 15 percent to the value of a proximate dwelling (Harnik & Welle, 2009).

- A 1998 study of property values along the Mountain Bay Trail in Brown County, WI, shows that lots adjacent to the trail sold faster and for an average of nine percent more than similar property not located next to the trail (Economic Benefits of Trails and Greenways, 1998).
- The Monon Trail in Indianapolis, IN, is credited for increasing property values by 11 percent for properties located within a 0.5-mile radius of the greenway trail (Property Values, Recreation Values, and Urban Greenways, Lindsey et. al, 2003).
- Research on the impacts of greenways on property values indicated significant positive impacts on the sale prices of properties in close proximity to the greenway, up to 20 percent of the value, resulting in millions of dollars in sale prices and enhanced property taxes (Journal of Leisure Research, 2005).
- Recent research conducted for MMSD by the University of Wisconsin-Milwaukee indicated that GI investments have strong positive impacts on surrounding property values. The study estimated that GI investments in the Menomonee Valley redevelopment south of the Corridor area could be recouped over a few years (Impact of Green Infrastructure on Property Values within the MMSD Planning Area: Case Studies, 2013).
- The Menomonee Valley revitalization resulted in 5,000 new Valley jobs, the creation of the Hank Aaron State Trail, improved environmental conditions, and a 229 percent increase in property value in the area that had been significantly economically depressed. (Renewthevalley.org, 2013).

Figure 4-4. Artistic Representation of Potential Greenway Corridor Features in the North Corridor Area

The above case studies determined that greenways can enhance property values ranging from 10 to as much as 225 percent. Several of these studies of similar greenway projects were performed in non-depressed areas. However, the Corridor area real estate is severely depressed; it is not unrealistic to assume that the increased value experience in the Menomonee Valley revitalization project could be realized in the Corridor. All of these impacts, whether immediately measurable or not, will ultimately contribute positively to the well-being of local residents and their quality of life for decades to come.

4.1.7 Redevelopment Opportunities

The Greenway Corridor concept is a linear spine for storm drainage and soft traffic (pedestrian and bicycle). Many recent case studies from other communities around the country have demonstrated the potential of greenways as effective public space focal points for new development and "triggers" to revitalizing existing neighborhoods. The availability of adjacent parcels for redevelopment is dependent in part on the final selected greenway route, but, in any case, should be designed as a focal public space. It should anticipate that new adjacent development will turn to front the greenway. It's essential that the tree planting and landscaping elements in the Corridor be of a high level of design quality to encourage adjacent redevelopment.

Of highest priority is the planting of a double row of trees with a regular spacing of not more than 40 feet on-center. This will effectively mark the greenway as a clear, formally designed public space and will reinforce it visually as a continuous greenway spine. There are many neighborhood examples in Milwaukee of trees planted in this pattern (e.g. Grant Boulevard), that offer visual evidence that this landscaping has contributed positively to enhancing and maintaining private investment and property values on adjacent parcels.

Figure 4-5. Artistic Representation of Potential Greenway Corridor Features in the South Corridor Area

4.1.8 Cost Savings

Cost savings associated with the Greenway Corridor are anticipated in several areas due to more effective performance of the drainage system, efficiencies of operations, cost reductions, and reduced damages. Several components present measurable cost savings that will contribute to reduced costs and increased long-term value associated with the Greenway Corridor improvements.

4.1.8.1 Foreclosed Property Maintenance Savings

The cost of foreclosures imposes a burden on financial institutions and the City that can result in significant costs. In 2012, the City possessed an average of approximately 800 properties due to foreclosure or unpaid property taxes. The average cost to the City to maintain one of these properties was $1,895 (DCD, 2014), amounting to approximately $1.5 million in annual operation and maintenance costs for the City. Returning these properties to the housing market would save these costs for the City, allowing these savings to be directed to other City services, economic redevelopment, or job creation efforts. In addition to these costs, the City also suffers from a loss of tax base revenues and property taxes for each of the foreclosed properties it must acquire, maintain, or demolish.

4.1.8.2 Flood Damage Reductions

The hydrologic and hydraulic analysis of the Corridor area estimated as many as 4,000 basements could experience backups during the one percent annual exceedance probability rainfall event. Combined with surface flooding problems in the Corridor, these basement backups are expected to cost local residents and

businesses millions of dollars in damages for major rainfall events. Implementing the proposed Greenway Corridor improvements is expected to reduce damages by as much as $130 million over a 20-year period.

4.1.8.3 Health and Healthcare Savings

The linkage of health and recreation is strong; with increased recreation comes a decrease in health issues. A 1998 study conducted in Lincoln, NE, showed that for every $1 of investment into trails and greenways, there was $2.69 in direct medical benefit. The City of Lincoln spent $209.28 per capita on construction and maintenance of the trails and greenways and the direct medical benefit was $564.41 per capita. A direct application of this almost three-fold added value to the Corridor area may not be valid for the Corridor in the City due to the time since the study was conducted, its location, and likely medical care differences between Lincoln and Milwaukee, but it does illustrate the net positive financial gain for the City and its residents (Americantrails.org, 2011).

Similarly, a study from Miami, FL, on the proposed 6.2 mile Ludlum Trail predicted that the development of Ludlam Trail will save the community between $1.68 million and $2.25 million annually in direct medical costs related to lack of physical exercise while leading to approximately 4,931 to 6,579 area residents becoming new exercisers (Americantrails.org, 2011).

4.1.9 Educational Opportunities

Injecting greenway space into an urban environment brings a variety of new opportunities for environmental education that didn't previously exist. The City's own UEC is a great example of an organization that utilizes the natural environment in an urban setting to educate people about topics such as water infiltration or wildlife characteristics. "The UEC serves more than 77,000 people each year. It utilizes the nationally recognized Neighborhood Environmental Education Project's (NEEP) innovative approach to environmental education that offers a unique opportunity for schools to supplement their science education. The NEEP program is for an entire year and functions as outdoor classrooms which reinforce science concepts taught in class with hands-on outdoor activities during multiple visits" (Urbanecologycenter.org, 2014). The Clarke Street School along the Greenway Corridor route is already a participant in this program.

Figure 4-6. Children's Playground (Milwaukee)

4.1.10 Recreational Opportunities

Figure 4-7. Urban Gardening (Milwaukee)

The proposed Greenway Corridor concept performs a fundamental drainage function, but the vision is to allow neighborhood life to permeate and enliven it. As a linear green space with a trail, the Greenway Corridor will attract dynamic recreational activities, walking, jogging, and biking, which can no doubt improve physical fitness for participants. For some, it will be a compelling new human-powered transportation connection providing links to opportunities outside of these neighborhoods. For others, it will be a source of productive recreation and urban gardening (agriculture). In addition to the potential to improve access to quality produce, gardening can be physically rigorous, socially engaging, as well as psychologically and even spiritually satisfying. All contribute to improved health and an enhanced quality of life. Further recreational enhancement to this greenway spine could include tot lots, adventure playgrounds, game courts, and playfields.

The Greenway Corridor offers the following recreational enhancements:

- 8.5-miles of permeable pavement bike path
- 23 acres of new greenspace drainage way
- Three acres for urban gardening (agriculture)

4.2 Job Creation and Workforce Development

4.2.1 Potential Opportunities for Job Creation and Training

From an economic perspective, the Corridor area has experienced a continuous decline over the past 40 years with a significant number of industries shutting down or leaving the City. Historically, the Corridor area was a thriving economic engine that grew and thrived as a major component of the City's industrial expansion. However, with the recent declines, the City faces many challenges to revitalize its neighborhoods and to create economic opportunities for its residents. Unemployment in the Corridor area is extremely high, ranging from 15 to as much as 45 percent, demonstrating a critical need for economic revitalization and job creation. (DCD, 2014)

The proposed Greenway Corridor improvements, combined with ongoing and planned redevelopment initiatives can be a major catalyst for economic redevelopment and job creation throughout the Corridor. The planned improvements will provide an influx of construction dollars over a number of years as the improvements are constructed and implemented. Redevelopment initiatives will also form the basis for initial economic opportunities and associated job creation.

The proposed North and South Corridor Improvements will provide construction and operation & maintenance job opportunities associated with the individual project construction components. The District's initial project in the North Corridor has a planned potential expenditure of up to $47 million over the next seven years and is planned to include demolition, sewer construction, excavation and detention basin construction, landscaping and restoration, and green infrastructure construction. Each of these work components can provide opportunities for the local labor force. For example, the green infrastructure

related work offers potential positions for general construction labor, landscaping work, and post construction basic plant care that can create basic occupational competency and can be a stepping stone to a long term, sustainable position in construction or other related trades.

The conceptual level construction, operations and maintenance cost estimates of the Greenway Corridor improvements were used to project estimates of short- and long-term job creation in the Corridor area. Using IMPLAN software, WHEDA collaborated with the University of Wisconsin-Extension Center for Community and Economic Development to estimate potential job creation associated with the Greenway Corridor improvements. These estimates indicate that in the short term, a total of 1,300 jobs are anticipated to be associated with the construction of the Greenway Corridor and drainage improvements (WHEDA, 2014). An additional 70 long-term jobs are projected to be needed for the operations and maintenance of the Greenway Corridor improvements.

Beyond the near-term construction projects, the City has initiated several initiatives to revitalize the area, the most significant being the Century City Business Park in the North Corridor. This modern industrial park redevelopment project is the centerpiece for a broader revitalization of the entire Corridor and has recently broke ground on its first development parcel. It is anticipated that when the Century City Business Park is fully developed, it will employ up to 1,000 workers in the Corridor area (City of Milwaukee DCD, 2014).

4.2.2 Job Creation and Workforce Development Initiatives

Taking full advantage of these potential job creation opportunities and connecting them with the local workforce is a crucial step to ensure meaningful job creation. Several institutions and programs exist to ensure that the development of the workforce occurs to its full potential.

MMSD, the City, Milwaukee County, the 30th Street Industrial Corridor Corporation (The Corridor), the Milwaukee Area Workforce Investment Board (MAWIB), WRTP/BIG STEP, and WHEDA all have a potential role or contribution in workforce development for the Corridor area.

4.2.2.1 MMSD, the City, Milwaukee County and WHEDA

MMSD, the City, Milwaukee County and WHEDA all have the authority to take responsibility for project construction or development by funding or assuming ownership of infrastructure construction projects or developments/redevelopments in the Corridor area. Their responsibility for, and involvement in, a project enables them to define certain goals or requirements to facilitate workforce development on their projects through their project specifications or bid documents. Each of these entities collaborates with other partners, such as the MAWIB to implement a strategy to maximize the potential opportunities for workforce development and job creation in the Corridor area.

4.2.2.2 30th Street Industrial Corridor Corporation (The Corridor)

The Corridor has recently initiated a "Local People-Local Jobs" program to connect the local workforce with area jobs. The Corridor already works with over 150 employers that summarize and distribute new job opportunities, and also research other nearby job openings that might be suitable for corridor residents. These jobs are then advertised to local people via email, website and community outreach meetings (churches, block clubs, community associations, etc). Often workers are referred to MAWIB for help with resumes and training. The Corridor has one staffer dedicated to the Local People – Local Jobs initiative, which is proving to be very popular.

4.2.2.3 Milwaukee Area Workforce Investment Board (MAWIB)

The primary facilitator and focal point for workforce development in the Milwaukee area is the Milwaukee Area Workforce Investment Board (MAWIB). MAWIB is a nonprofit organization with the mission of

ensuring the Milwaukee area workforce has the skills that match employer needs and lead to self-sufficiency. MAWIB's role is to coordinate, plan, and collaborate with businesses to maximize the use of the local workforce to meet local job needs.

MAWIB is a public/private partnership that serves both the adult and youth workforces in Milwaukee County with the purpose to plan, administer and coordinate employment and training programs to meet potential job opportunities such as those offered by the planned projects for the Greenway Corridor. "MAWIB creates and manages a focused education, training and employment system that involves local educators, prospective training operators, area employers, job seekers and employees" (MAWIB, 2014)

MAWIB focuses on dislocated, adult, and youth categories of workers. One of its primary objectives is to develop specific workforce strategies in response to planned or anticipated projects and job creation initiatives. In the case of the Greenway Corridor project, MAWIB will define a workforce strategy for each planned job opportunity associated with the project. As a facilitator, MAWIB works with other entities with job opportunities to maximize the local workforce opportunities for the residents of the Corridor area.

4.2.2.4 Wisconsin Regional Training Partnership/Building Industry Group Skilled Trades Employment Program (WRTP/BIG STEP)

WRTP/BIG STEP is a partnership formed to sponsor "programs that expand employment and advancement opportunities, upgrade skills of the current workforce, and recruit qualified workforce." (WRTP, 2014) It provides pre-employment training for potential job candidates to qualify them for long term sustainable jobs in the industrial sector. It also facilities and coordinates employer-driven need training that provides potential workers with the skills to meet employer needs.

WRTP/BIG STEP facilitates the following training opportunities:

- Pre-Apprenticeship Training – individual training to improve academic skills for apprenticeship exams
- Training Certificate Programs – specific skills training for job sections such as boilermakers, bricklayers, carpenters, etc
- Certification Opportunities – specific certifications for individuals to meet workforce requirements of the Milwaukee Residential Preference Program (RPP) and Communities in Need (COIN)
- Direct Placements – direct assistance to employers and job candidates by matching candidate skill sets with business/community needs

4.2.3 Training Opportunities Associated with Corridor Job Opportunities

The entities described above are responsible for a number of projects and initiatives with job opportunities as well as the facilitation of training programs that will interface with the various Corridor related projects. Regionally, MAWIB assists in establishing training programs that are "credentialed" and are intended to fill-in gaps of worker skill deficiencies and to fill the job pipeline with long term sustainable trained staff. WRTP/BIG STEP provides the specific training. For example, working collaboratively, MMSD, MAWIB and WRTP/BIG STEP have defined a "sewer & water "- credentialed training program that would be utilized for construction of these projects. MAWIB will also assist in establishing new training such as might be required during installation of the inlet restrictors for the South Corridor project.

Specific to its infrastructure work within its service area, MMSD has several facilitated training programs that are directly applicable to future Corridor work and potential job opportunities as presented in **Table 4-1**.

Table 4-1. MMSD-Facilitated Training Programs

Opportunities Provided or Facilitated by MMSD That Are Directly Applicable to the Greenway Corridor
Training to small and disadvantaged engineering and construction firms in the business development area to help them grow their businesses.
Engineering and Construction Management Training Program to increase the capabilities and capacity of local small business engineering and management staff.
RISE (Regional Internships in Science and Engineering), an intern program to provide local college/university students with internships and ideally long term job prospects.
Pre-Apprentice training through WRTP/BIG STEP to meet anticipated construction needs and requirements with the local workforce.
Green Infrastructure and its defined pathway to the construction trades.

4.3 Implementation

4.3.1 Responsible Parties

MMSD and WHEDA recently facilitated the formation of the CAC to create an entity that can effectively and objectively move forward on the Greenway Corridor. The key stakeholders represented on the CAC must leverage their energy and resources, and focus their efforts to be the vehicle that will move the Corridor forward in the short term, but to also lay the groundwork for long-term implementation and sustainability. One key activity for the CAC should be to clearly define the responsibilities of the participating partners to address the many action items and activities that will be required. The CAC should formulate an Action Plan comprising specific tasks, responsibilities, timeline, and funding opportunities as a framework for Greenway Corridor implementation.

The Action Plan should not only address the major recommendations presented in the North and South Corridor planning reports, it should also identify and prioritize the other many details and issues that will need resolution for effective implementation. These include:

- Constructability issues that will require additional design effort or coordination such as traffic control and railroad crossing approval
- Identification of unknowns, such as selection of the final corridor route, funding, or property acquisition issues
- Integration of potential development activities with the proposed Greenway Corridor

Figure 4-8. Greenway Corridor Action Plan

- Permitting and agency approvals ranging from documentation of water quality enhancements to acceptable mitigation of environmental justice issues

- Further quantification of benefits associated with the Greenway Corridor project

4.3.2 Funding

A funding analysis for the Greenway Corridor solution is identified as a first critical step to implementation. Even in these difficult economic times, funding opportunities exist and must be explored for potential application to the Greenway Corridor project. Financial funding will be challenging because of the magnitude of the project and the multi-agency collaboration that will be required for implementation.

The City has been successful in securing significant funding for a number of initiatives in the Corridor area in the recent past and has secured nearly $13 million from a number of funding agencies, including: WDNR, Wisconsin Economic Development Corporation (WEDC), U.S. EPA, and Department of Housing and Urban Development (HUD) (City of Milwaukee, 2014). MMSD has initiated the search for potential funding by contacting a number of state and federal agencies, and facilitating two informational and partnering meetings to engage potential funding agencies and identify programs that will support the Greenway Corridor project. Additional follow-up meetings are ongoing to support funding efforts. MMSD and the City have committed funds for the design, construction, and post-construction activities of the early-out stormwater solution project in the North Corridor.

Table 4-2 presents a summary of the major funding agencies that may present an opportunity for the Greenway Corridor project. The initial funding outreach by MMSD should serve as the starting point for continued funding discussions and the initiation of a funding study by the CAC to address this critical next step in the implementation process.

Table 4-2. Potential Major Funding Opportunities for the Greenway Corridor

Partner / Greenway Corridor Component	Infrastructure Analysis / Design	Stormwater/ Sewer Infrastructure	Greenway Infrastructure & Components	Property Acquisition	Environ-mental Cleanup	Transportation Infrastructure	Economic Redevelop-ment
Federal							
EPA	X	X	X	X	X		
USACE	X	X	X				
HUD	X	X	X				X
USDOT	X	X	X		X	X	X
EDA				X		X	X
State							
WDNR	X	X	X	X	X		
WHEDA				X			X
WisDOT			X	X		X	
Local							
City DPW	X	X	X	X	X	X	
City DCD				X	X		X
MMSD	X	X	X	X	X		
Private							
Private Investment		X	X	X	X	X	X
Philanthropic Organizations			X				X

4.3.3 Timeline for Implementation

The timeline for implementation of the Greenway Corridor is at a formative stage with this report defining the first steps in the implementation process. Although the responsibility for establishing a schedule for

implementation rests with the CAC, an initial timeline is presented here to begin this process and to identify several critical steps that must be taken as soon as practicable.

4.3.4 Funding, the First of Several Critical Initial Steps

The importance of securing an appropriate level of funding is the fundamental first step in defining an implementation timeline, but several additional activities should be initiated as soon as sufficient funding is available. As CAC moves forward with implementation, the following tasks or activities should be initiated within the first six months of implementation:

- CAC Action Plan
- Community outreach
- Greenway Corridor Neighborhood Plan
- Economic analysis
- Required land preservation
- Funding plan
- Environmental review
- Workforce development strategy

Each of these activities is critical in terms of moving the overall Greenway Corridor project forward into the next phase of design and property acquisition. **Table 4-3** presents a timeline of these activities in the first phase of implementation of the Greenway Corridor. The proposed timeline is aggressive and assumes that funding will be secured in the first year of implementation. Assuming a best-case scenario that funding is successful and secured early, and that environmental issues are effectively resolved, it may be possible to begin Greenway Corridor design with route finalization and property identification in late 2016. The timing for completion of design and property acquisition will be determined based on the final timeline developed for construction based on the available funding. These initial actions will lay the groundwork for systematic implementation of the Greenway Corridor solution for the entire Corridor area.

4.3.5 Greenway Corridor Early-out Projects

Several early-out projects have been identified in the North Corridor area and have preliminary approval and funding in place. Design for the North Corridor stormwater solution is scheduled for completion in 2015 as the first early-out project with construction in 2016. Additional early-out projects may be identified as planning proceeds. These early-out projects will be significant first steps to reduce flood damages and will lay the groundwork for systematic implementation of the Greenway Corridor solution for the entire Corridor area.

Table 4-3. Greenway Corridor Timeline

	2015				2016			
	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Corridor Advisory Council Action Plan								
Community Outreach								
Greenway Corridor Neighborhood Plan								
Preliminary Engineering								
Design (TBD)								
Economic Analysis								
Required Land Preservation								
Funding Plan								
Parcel Acquisition Plan								
Property Acquisition (TBD)								
Environmental Review								
Environmental Assessment								
O&M Responsibility								
Early-out Project Implementation								
Workforce Development Strategy								
Greenway Corridor Construction (TBD)								

4.3.6 Corridor Workforce Strategy Collaboration and Specific Opportunities

MMSD and MAWIB collaborate to define long-term and individual project strategies to achieve local workforce development goals through specific requirements in individual project bid documents. These strategies specify minimum requirements for local work force involvement and enhancement through individual construction projects throughout its service area.

MAWIB and MMSD are currently working together to develop a Workforce Development Strategy for the initial North Corridor construction projects to maximize the opportunity for job creation and worker skill acquisition. The strategy will identify the opportunities for work force development and job creation. Some initial requirements include:

- A certain percentage of the work hours be provided by "Fresh Coast" workers. Although the percentage will vary depending on the specific project, selected projects could have a percentage as high as 50-60 percent
- Fresh Coast workers will be defined by a set of zip codes that include and surround the Corridor
- Utilizing prevailing wage rates and setting a wage floor on projects without prevailing wage requirements
- Maximize apprentice utilization through journey-worker to apprentice ratios
- Assistance by WRTP/BIG STEP in identifying the Fresh Coast workers

The District and MAWIB will define a strategy for each project, identifying the specific requirements appropriate for each project and will include them in the contract documents for bidding, ensuring that they are implemented with award of each construction project.

MAWIB is also working with the Department of City Development to collaborate more closely in the long term on future opportunities associated with its redevelopment initiatives such as Century City I and II to better prepare the workforce to meet these needs. MAWIB anticipates that its efforts will be further enhanced by the "Prosperity Plan" being prepared by DCD which will define a vision and supporting principles to put the City and its residents on the path to economic success. The Prosperity Plan will focus on location based opportunities, human capital development, entrepreneurship and innovation, and quality of life and place. Specifically, the Prosperity Plan is anticipated to build on the Mayor's Manufacturing Partnership to develop a Center for Advanced Manufacturing at Century City, helping to align the local workforce with these local industry growth opportunities.

Section 5
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