METROPOLITAN
DESIGN CENTER

University District Alliance

URBAN DESIGN FRAMEWORK

PHASE II

Using Greenways and Green Infrastructure as a Vital Design Strategy to Achieve Sustainable Communities

BOHEMIAN FLATS

ST. ANTHONY MAIN

COLLEGE OF DESIGN UNIVERSITY OF MINNESOTA

A Special Thanks

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TABLE OF CONTENTS

The Argument:
Toward a Possible Means of Persuasion

The only true voyage of discovery, the only fountain of Eternal Youth, would be not to visit strange lands but to possess other eyes, to behold the universe through the eyes of another, of a hundred other, to behold the hundred universes that each of them beholds…

Marcel Proust
Remembrance of Things Past

The territory occupied by the University District was described not long ago as an extraordinary landscape of woodlands, marshes, and waterfalls falling over the steep bluffs of the Mississippi River. Stephen H. Long's account of his July 1817 expedition to the Upper Mississippi River describes the landscape as "romantic in the highest degree." His journal entry portrayed a landscape of "Oaks, Hiccory, Walnut, Lynden, Sugar tree…and evergreans, such as Pine, Cedar and Juniper"… He goes on to describe the diversity of shrubs and flowers, remarking with a degree of enthusiasm about one of the many waterfalls along the bluffs. "A few yards below was a beautiful cascade of fine spring water, poring down from a projected precipice…On our left was the Mississippi hurrying thro its channel with great velocity, and about ¾ mile above us in plain view was the majestic cataract of the Falls of Saint Anthony" (1). This account set his point of observation at the base of the Fawn's Leap Falls or Tuttle's Brook Falls as mapped later by the USGS survey of 1867. Similar landscape splendor along the terraces of the Mississippi River was described by another explorer H. R. Schoolcraft who wrote "Nothing can exceed the beauty of the prairies which skirt both banks of the [Mississippi River] above [Saint Anthony Falls]. They do not, however, consist of unbroken plain, but are…interspersed with groves of oaks, which throw an air of the most picturesque beauty on the scene" (2).

At present, some fragile remnants of this "natural" landscape are still visible if you know where to look. However, most of this earlier splendor was rapidly transformed by the late 19th century signaling the birth of a new cultural episode manifesting the progressive ideology that dominated the period (3). The early settlers in central Minnesota insisted in making the Upper Mississippi navigable, which required first to significantly engineer the river course so that steamboats could transport greater number goods and people upstream. To accelerate the expansion of the territory and make the movement of agricultural goods more reliable, the introduction of the Rail into the upper Mississippi region became necessary. By the mid 1800s, rail was the dominant medium of passenger and commercial transport, leaving the Mississippi as the source of hydroelectric power and the preferred medium for transporting timber (4). By late 1870, most of the deciduous woodland splendor –the Big Woods recorded by Long-- had vanished. Most of the wetlands were lost to agriculture, leaving the new landscape of the University District as an emerging urban settlement.

Seeking the expansion of new development opportunities, the Minnesota Legislature began enacting laws to allow the State to construct a new system of communications involving roads, highways, and bridges --a process that began dissecting the landscape once more as early as 1920s. So it is not difficult to understand that the metropolitan landscape that we see today in the University District contains the historical traces of these transformative stages over the past 150 years.

The Approach
In dealing with such a complex territory, we have made an effort to present a research-based design model that responds to the current physical complexities inherent in the District—its legacy as an agricultural distribution center is still evident judging by the physical infrastructure present, the obstacles to reach the waterfront despite the District's proximity and strong cultural association with the Mississippi River, and having the four residential neighborhoods bordering a well-known and vibrant urban university. In so doing, rather than providing formal design solutions to every possible situation, we have relied on a metropolitan design approach that clearly presents the realities of the place **what is**, in order to bring an awareness, and further exploration of **what is possible** given the communities and stakeholders' expectations for the District's future. As such, and placing an emphasis on the possible, this research project provides a vision for the University district that:

- Presents a biophysical and cultural reality of the District's landscape, which still bears the traces of history. A transformed territory that is neither "natural" nor strictly "urban" but a complex juxtaposition of hybrid and remnant landscapes that are important for their cognitive ability to help us to read time and experience where we live.

- Provide a series of design possibilities whose resolutions challenge traditional convictions, and requires new metropolitan dialogues among different government agencies to fulfill the promise of achieving a truly diverse, sustainable, culturally vigorous, and economically vital University District.

Using a series of public meetings and workshops, the Metropolitan Design Center has developed a vision for the District outlining specific proposals for reflection and action. Using known design and research methods in the fields of landscape and urban ecology, the proposals should serve as a regenerative force to re-establish a new outlook on the University District based on three implementation objectives:

- Identify natural, semi-natural and cultural corridors that can function as Greenways to regenerate the landscape with the potential for linking natural vegetation, remnant wetlands, fragile fluvial corridors and cultural landscapes with the leading greenway corridor—the Mississippi River.

- Develop a metropolitan design approach that utilizes principles from Green Infrastructure to deal with stormwater management. This entails adopting strategies that deviate from the current pipeshed approach to capture and infiltrate rainfall in situ thus reducing the rate and amount of stormwater runoff and pollutants reaching the Mississippi River.

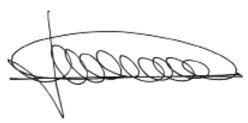
- Apply urban design principles based on Living Streets models by embracing more holistic and multidisciplinary **Low-Impact-Design** approaches for streets, alleys, and parking lots, "civilizing" vehicular traffic, encourage greater walkability, maximize infiltration rates using permeable pavement and develop a "living" landscape design strategy that replaces existing lawns with local native vegetation to improve biodiversity.

New programs for design emerge when design practice shifts its attention from formally solving perceived problems to identifying actions that support expressions of social life. These programs reveal and celebrate the new forms of urbanity emerging out of today's political economy and its culture. So doing … metropolitan urbanism opens up new territories for design consideration. It stakes out new sites of operations, introduces new methods of working, and identifies new clients.

Jacqueline Tatom
Programs for Metropolitan Urbanism

As such, we are providing an integrated metropolitan design approach to transform the existing hybrid landscapes of the University District with the foresight for implementing design strategies that challenges both the architectural approach of conceiving the city as "big architecture" and the traditional, urban planning approach, which use the "master plan" primarily as an instrument for optimizing development.

Our most sincere thanks to the Alliance Community for this special opportunity,



Ignacio San Martin, Dayton Hudson Professor
Chair of Urban Design and Director
Metropolitan Design Center
College of Design
The University of Minnesota

1. Long, Stephen H., J.E. Colhoun, L.M. Kane, J.D. Holmquist, and C. Gilman (1978). The Northern Expeditions of Stephen H. Long: the Journals of 1817 Minnesota Historical Society Press. St. Paul, MN.
2. Mason, Philip P., ed.(1993). Schoolcraft's Expedition to Lake Itasca: The Discovery of the Source of the Mississippi. Michigan State University Press. East Lansing, MI.
3. See Leo Marx' work The Machine in the Garden 1964, and more precisely here The American Ideology of Space in Denatured Visions: Landscape and Culture in the Twentieth Century, MOMA (1988)
4. John O. Anfinson, et al. (2003). River of History, US Army Corps of Engineers, Saint Paul District

Findings From Phase I

Contested Territories: An Inventory of the District's Critical Sites

The Urban Design Framework of Phase I encompassed an in depth environmental inventory of the University District and a detailed inventory of the critical "Contested Territories" found within the district. Contested territories result from portions of land owned or controlled by different stakeholders or political jurisdictions whose future purpose is uncertain restricting the formulation of a comprehensive urban design vision for the District. Despite the many attempts at drafting master plans over the years, they have not resolved important barriers hampering development and the opportunities for bringing a landscape and urban ecological approach as part of the development process have not been part of the discussions. Phase I concluded with a formal discussion of these limitations brought at a community workshop, which provided an opportunity for a healthy discussion. These findings provided the background for shaping the direction of the work conducted in Phase II.

Mass use of the landscape might represent only a choice among inadequate alternatives; not the satisfaction of deep human need, but knowledge of our needs and satisfaction from the landscape is minimal. The most troubling environmental problem of the years ahead might not be conserving energy or protecting natural systems but emotionally coping with a landscape more transitory than we have ever experienced, or that Proust could have ever envisioned.

Robert Riley
Speculations on the New American Landscape

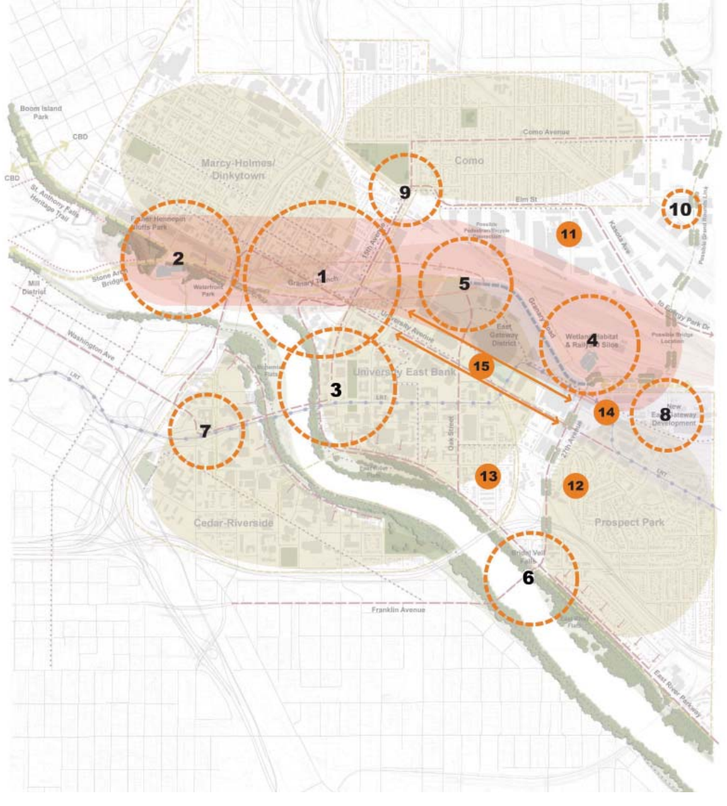
Contested Territories

Site Priority Ranking

1. Granary Corridor
2. Father Hennepin Park
3. East Bank Transit Zone
4. Wetland and Grain Silos
5. Oak St. Crossing and East Gateway District
6. Riverfront (Bridal Veil, East River Flats, Bohemian Flats)
7. West Bank Transit Zone
8. East Gateway Transit and Development Zone
9. 15th Ave Squeeze
10. Grand Rounds Connection

Additional Issues

11. The Kasota District
12. Glendale Neighborhood
13. Motley Neighborhood
14. Silo Preservation and Redevelopment
15. University and 4th St



Community Feedback

It is important to repair the damage / disruption created by (existing transportation infrastructure) but first it is most important that no further harm is done. How do we control/impact projects that are on the books that do not support the greater vision of the District?

University should be the center point and point for all connections / connectivity

Connections to Downtown are important

West Bank Connections – Cedar Riverside is most disconnected from the rest of the district.

Granary Road is a major issue and will have impacts across the Board – it is a huge opportunity and should be developed as a Gentle Connector – greenway / pedestrian / bike focused. Something that helps not harms the neighborhoods. West end of Granary Road – potential negative impact of trucks on neighborhood.

East end of Washington Traffic – impacts of closure of Washington for Central Corridor

LRT station areas thru-out the district are critical for setting the tone and taking the opportunity to make thoughtful development plans that meet the Districts needs / goals.

Can University and 4th Streets be two-way streets to slow and calm traffic? As they are now they act as thru-ways for high volume and high speed (relatively) traffic and are dangerous / uncomfortable for pedestrians and cut up the neighborhoods?

Saint Paul Interface – we need to me thinking beyond the District boundaries esp. to the east. The Kasota District has not been discussed that should be included as well.

We need a better understanding of: a. the university's historical impact on the neighborhood, & b. the socio-political map of the District and the impacts of this facet(s)

Disconnection of Southeast Como from the rest of the district – how does it become connected? Oak Street – University connection to SE Como / SE Como connection to University

What about winter! Minneapolis is a winter city so the walkability / livability year round needs to be considered in all of the plans

East gateway We need to support mixed development, More housing (options), Walk-ability is key

Central Corridor Station Area in Cedar Riverside Maximize the positive impact and benefit for the neighborhood (district)

Overall importance - sustainability is connected directly to Quality of Life

Granary Road – should be developed as a Gentle Connector – greenway / pedestrian / bike focused. (something that helps not harms the neighborhoods.)

Land bridge over the freeway (35W) depression at 5th street which was made specifically for a park over the Freeway – it was discussed in 35w plans but never followed up on.

It is important for us to understand how many jurisdictions are at work here in the District? How does it work? How do we understand / track / impact what is getting done?

The District should support the strategy that every future project / development / alteration that gets done that it becomes a "green zipper" – each project is an opportunity to make things add up and to integrate sustainable / green components.

Access to the river for neighbors and from the neighborhoods needs to be incorporated (at the A-Mill project) and at all other future riverfront projects. Connect to the River and the river to the neighborhoods – Bridal Veil Falls

The Central Corridor project especially in the West Bank Area station is an important opportunity to integrate the West Bank into the City and the District.

In the discussion about density and dwelling units per acre it is important to include a variety of housing options and choices so that we can have a diversity of neighbors and opportunities for people to transition and stay in the district – students remaining, faculty buying in, seniors aging in place....etc. Focus on the people.

What if a new car/ped/bike connections was made over the River from Oak Street to Stadium Village to Cedar-Riverside? With Washington Avenue closed to cars a new connection is needed. This would also make another loop around the District and re-connect Cedar Riverside to the rest of the District.

Community Workshop at Rapson Hall
November 20, 2010.

On the Nature of Greenways: Greenways as a Fundamental Urban Design Strategy

The integration of ecological principles with land use and regional planning has been evolving over the past half a century since the influential book Design with Nature made the inspiring call for a new approach to urban and regional land development. McHarg's vision for landscape ecological planning underscores the need to recognize the landscape of a region as having diverse living ecosystems, each of which have different degrees of suitability to accept development without weakening the vitality of the ecological system. Over the years, landscape ecological planning has evolved into new fields of applied landscape ecology, biogeography, conservation biology, and urban ecology incorporating these new fields into urban planning, urban design, and landscape architecture.

As such, urban greenways are linear landscapes that function primarily as linkages among different scales and types of landscapes providing multiple opportunities for recreation, educational opportunities, and cultural resources. Therefore, it is important to think of greenway corridors as important landscape types that should be part of an entire urban and metropolitan planning strategy.

Daniel S. Smith & Paul C. Hellmund
Designing Green Ways: Sustainable Landscapes for Nature and People

In general terms, landscape ecology provides a view of regional landscapes as heterogeneous systems of land ('mosaics') over which particular local ecosystems (woodlands, meadows, marshes) and land-uses (villages, towns) occur. As urban settlement increases, different types of landscapes emerge demonstrating a particular 'composition' with specific 'functioning' characteristics, which 'change' over time and space. So, in landscape ecology, the landscape of a territory tends to display 'patches' of homogeneous landscape types linked by functional elements ('corridors') allowing the spread of different degrees of ecological diversity.

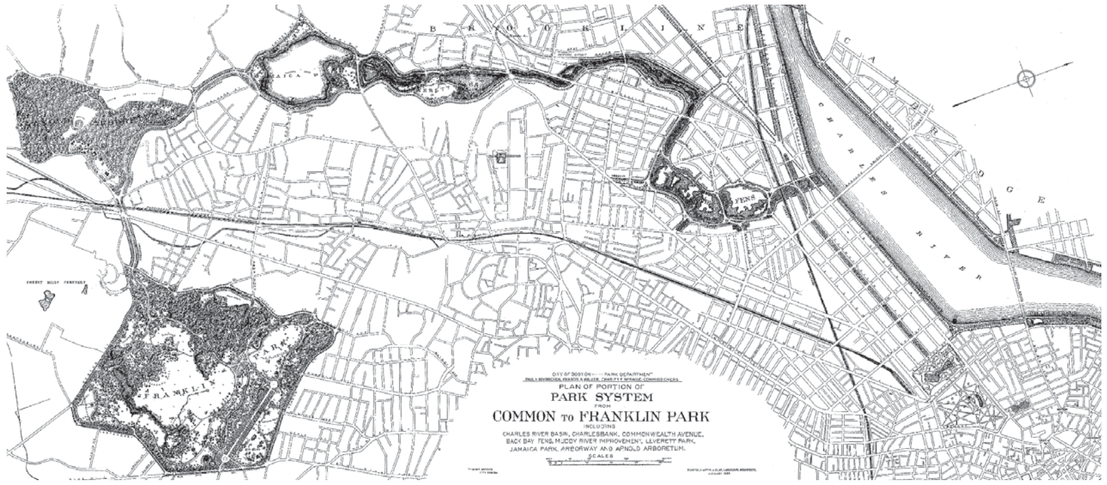
When working in urban ecosystems, it is important to recognize that we often deal with fragmented or remnant landscapes as a byproduct of development and the best way to improve the use and vitality of these remnant 'patches' is to integrate them into the larger functional ecological system to which they belong. This outlook of attempting to integrate remnants of "natural' landscapes (including human habitats) represents the central preoccupation in this study. Thinking from the point of view of urban ecology, we are challenged with this possibility of transforming the University District within a network of primary and secondary greenways that links to our principal ecological corridor—the Mississippi River—and with the surrounding metropolitan greenway system.

Greenway Terminology

Term	Term Usage	Function: *Biotic Cultural Multi-functional*	Scale: *Continental National Regional Local*	Primary Spatial Basis *Physical Biological Cultural*
Ecological Networks	Europe	B	C, N, R, L	B
Habitat Networks	Europe America	B	N, R, L	B
Ecological Infrastructure	Europe	B	C, N, R, L	B
Greenways	America	B, C, M	R, L	P, C
Wildlife Corridors	America	B	R, L	B
Riparian Buffers	Europe America	B, M	R, L	P
Ecological Corridors	America	B	R, L	P
Environmental Corridors	America	M	R, L	P
Greenbelts	Europe America	C	R, L	C
Landscape Linkages	America	B	R, L	B

We want a ground to which people may easily go after their day's work is done, and where they may stroll for an hour, seeing, hearing and feeling nothing of the bustle and jar of the streets, where they shall, in effect, find the city put far away from them.... We want, especially, the greatest possible contrast with the restraining and confining conditions, which compel us to walk circumspectly, watchfully, jealously, which compel us to look closely upon others without sympathy.

Frederick Law Olmsted
Public Parks and the Enlargement of Towns, 1870



Design for the "Emerald Necklace" in Boston by Frederick Law Olmsted

Look forward for a century, to the time when the city has a population of a million, and think what will be their wants. They will have wealth enough to purchase all the money can buy but all their wealth cannot purchase a lost opportunity, or restore natural features of grandeur and beauty…

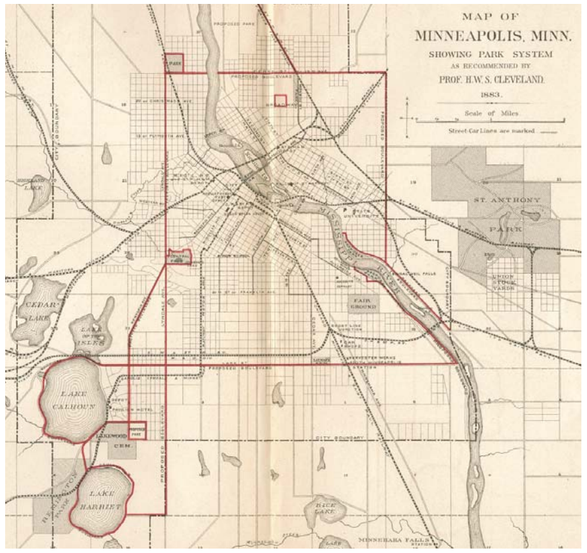
Horace W. S. Cleveland
In David C. Smith, City of Parks

So we must think of urban greenways not as ecological corridors, but as primarily linear corridors that incorporate multi-purpose land uses, for a variety of human leisure activities. While greenways can also link to or connect with specific wildlife habitats, they are not in principle considered as 'wildlife corridors' (see table). In many instances, the land associated with greenways is a by-product of redevelopment opportunities using abandoned roads, railroads, and existing right-of-ways providing the opportunity for connecting them with riparian corridors, wetlands, or municipal or regional parks.

One distinctive characteristic of great urban greenways is their ability to link different landscape types with other greenways or trails and to connect people with riparian corridors, wetland habitats, and countryside, bringing forward the richness and complexity of the land we inhabit.

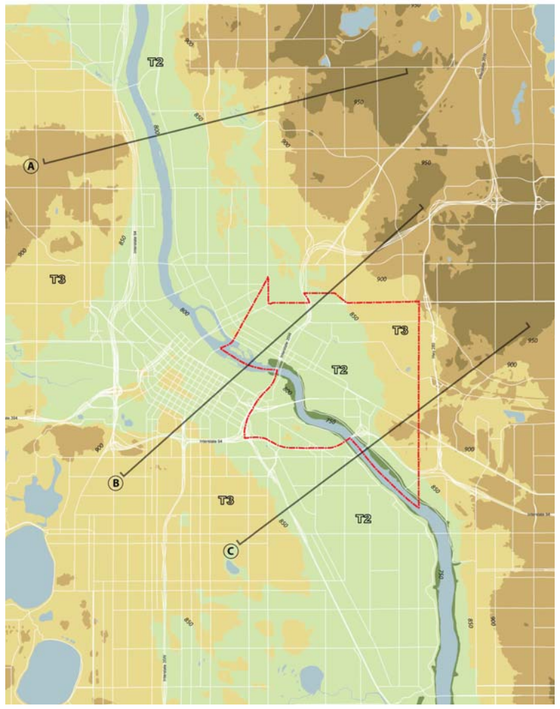
Greenways of this type have an interesting history in the USA. Well before the term was in use during the late 1950s, one of America's first, and foremost, "greenway" corridors, the Emerald Necklace in Boston, was planned in the 1860s and designed in stages by F. L. Olmsted. It consists of seven miles of trails connecting Boston Commons with Back Bay Fens Park, Jamaica Pond, Harvard's Arboretum and ending in Franklin Park along the Muddy River wilderness corridor.

Building from this experience, Charles Eliot a Massachusetts landscape architect and former Olmstead apprentice had the far-reaching opportunity of being commissioned to design the Boston Metropolitan Park System. This gave birth in North America to Park Boards commissioning landscape architects to be engaged in designing projects related to Parkway Systems and subsequently Parkways became the first greenways. Among these, of course, is our own jewel of a Park System --the Minneapolis Grand Rounds designed by H. W. S Cleveland and consisting of a 52-mile scenic greenway corridor connecting a chain of lakes with the Mississippi River corridor.

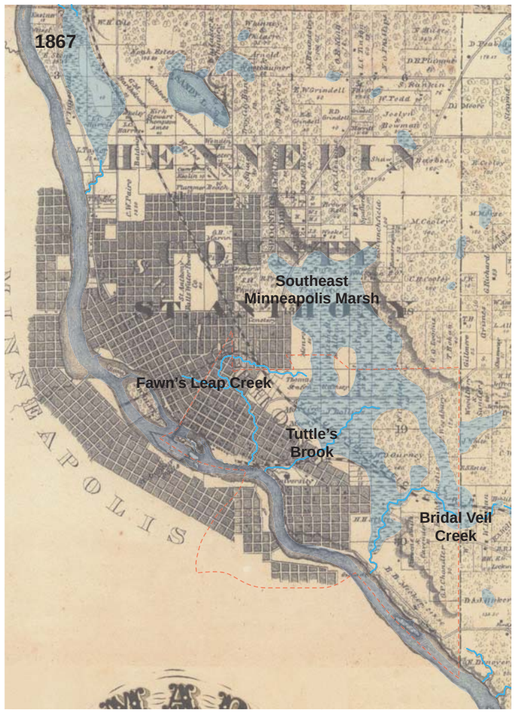


Minneapolis Park System Map by Horace Cleveland, 1883

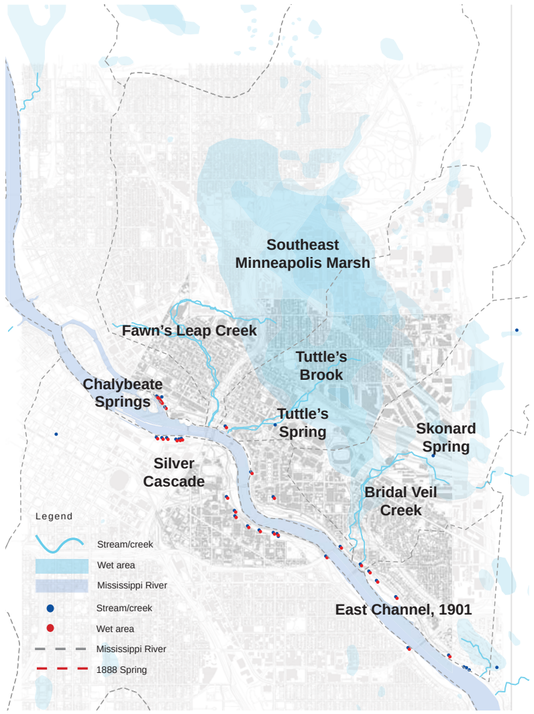
Searching for the Ecological and Cultural Landscape of the University District



Upper Mississippi River Landform: Elevation and Terraces



1867 Rose and St. Anthony Townships



Overlay of Historic Wetland Features

District Area Wetlands

Topography, Streams, and Springs

Fawn's Leap, 1875

The physical landscape of the University District is characterized by a relatively flat territory geologically consisting of quaternary glacial till deposits. The Mississippi River dissects the District forming two distinct level-plain terraces where much of the District is located. Within the boundaries of the District and above the terrace, glacial outwash deposits contain remnant lacustrine and marsh deposits at specific locations. Early maps created in 1860 and 1867 show the growing city of Minneapolis encroaching on a large wetland, known as the Southeast Minneapolis Marsh that drained into the Mississippi River via three primary creeks known as Fawn's Leap Creek, Tuttle's Brook and Bridal Veil Creek. By 1896, urban development had greatly expanded and many of the creeks and large portions of the marsh were infilled or drained. Topographic section and minor wetlands along Tuttle's Brook can still be found along Granary Corridor leading to the Mississippi River at the base of the I-35W Bridge. Today, there are no physical traces of Fawn's Leap Creek and Bridal Veil has been filled in but still drains into the Mississippi River. (Topography and Marsh maps)

Tuttle's Brook was a natural drainage that emptied into the Mississippi River near the current University of Minnesota power plant…Tuttle's Brook has long been buried in storm sewer pipes, and because no visible features exist today (waterfall), the brook has been largely forgotten.

MWMO, Bridal Veil Creek Subwatershed Desk Study

Springs once proliferated along the river gorge in Minneapolis, providing clean drinking water in the early years of urban development. Categorized as Platteville springs, the ground water seeps down through the limestone and where it encounters the thin layer of impermeable shale below it, is shunted to the surface along the river gorge bluff. Several of the springs that were originally surveyed, such as Chalybeate Springs near St. Anthony Falls, still exist though the quality of their water can no longer be guaranteed. Other springs that once existed inland from the river, such as Tuttle's Spring and Skonard Spring, are no longer present due to urban development.

Remnant Wetlands

To gain an understanding of the types and status of existing wetlands in the University District, the Metropolitan Design Center explored the two wetland classification systems predominantly used in Minnesota: The Classification of Wetlands and Deepwater Habitats of the United States, by Cowardin et al. (1979), and The United States Fish and Wildlife Service Circular 39, by Shaw and Fredine (1956, 1971). Cowardin's classification delineates wetlands into systems, subsystems, classes, subclasses, and modifiers, and is used by the National Wetland Inventory (NWI). Shaw and Fredine's Circular 39 organizes wetlands into eight types: Seasonally Flooded Basin or Flat, Wet Meadow, Shallow Marsh, Deep Marsh, Shallow Open Water, Shrub Swamp, Wooded Swamp, and Bog. While these two systems overlap, the Circular 39 is more general and the Cowardin system is more specific, the Minnesota Department of Natural Resources (MnDNR) and the Metropolitan Mosquito Control District (MMCD) use circular 39 classification system.

The Metropolitan Mosquito Control District is a regional entity dedicated to "protecting the public from disease and annoyance caused by mosquitoes, black flies and ticks, in an environmentally safe manner". Their program includes documenting mosquito breeding habitat in the Metro area, thus gathering detailed information about the location and type of existing wetlands and wet areas in the Twin Cities. Because of the differences in disturbance between pristine wetlands and those found in urban environments, the MMCD devised a subsystem of the Circular 39 to describe the wet areas in the Metro area. The first number of each type corresponds to one of the eight types of the Circular 39, and the second number corresponds to the system they devised based on dominant plant species.

The University Spring, for example, was located on the banks of Tuttle's Creek, whose dry gulch still separates East Bank Campus from Dinkytown. This spring was used to supply water to the early University, a hydraulic ram raising the water to the buildings. The class of 1885 built a wall about the spring and fixed it up as a memorial (Johnson, 1908). The spring became contaminated with sewage, the student newspaper lampooned the contents of the water, and when the Northern Pacific tracks were laid along the creek bed in 1924, it vanished altogether.

Greg Brick, Geologist

Lost Waterfalls & Historic Features of the Mississippi River Gorge

Dotted along the Mississippi River Gorge of the University District are a number of natural and cultural features that demonstrate the ever-evolving relationship between humans and the river. Some of these springs, waterfalls, creeks, river flats, and waterfront parks are lost forever, some still exist today, and some have been altered almost beyond recognition.

B Chalybeate Springs

Chalybeate Springs Resort, 1862

Chalybeate Springs Resort, 1875

Chalybeate Springs Resort, 1875

Many springs exist along the river gorge. One of the most significant is Chalybeate Falls, located at the rock face cliff adjacent to the St. Anthony Falls. These mineral (iron) springs were believed to be sacred by the Dakota and the mud they gathered from the springs was thought to be constantly renewed by spirits. In 1875, entrepreneur M.P. Pettingill established a tourist attraction around the springs with a restaurant, boat launch, underground boat rides through a tunnel, and a walkway along the springs. He sold the spring water in bottles for its supposed health benefits. In 1881, the Chute Tunnel tailrace collapsed and damaged the resort. The springs still exist today, on the slope of the river edge near the Pillsbury "A" Mill.

A St. Anthony Falls & Hennepin Island

East side of St. Anthony Falls, 1851

Industry generated by the energy potential of St. Anthony Falls began in the 1850s, with lumber mills and flourmills constructed across the east channel. Once considered the largest flourmill in the world, the Pillsbury "A" Mill and its tailraces were constructed in the 1880s. The tailraces were used for power until the 1950s. Currently, the tailraces are used as stormwater outlets. Damming this portion of the river for hydroelectric power around 1894 led to the complete obstruction of water flowing over the east face of the St. Anthony Falls. The edge of the former waterfall can still be seen today in Pillsbury Park.

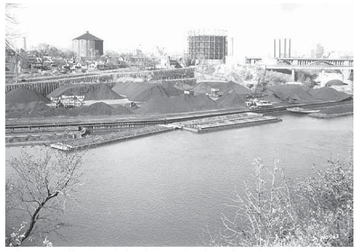
C Waterfalls: Fawn's Leap, Silver Cascade, and Bridal Veil Falls

In the earliest maps of the 1860s, three meandering creeks, Fawn's Leap Creek, Tuttle's Brook, and Bridal Veil Creek were indicated as draining a large wetland complex once found in today's Como neighborhood. Each of the creeks emptied into the Mississippi River gorge with a beautiful waterfall. These falls, known as Fawn's Leap, Silver Cascade, and Bridal Veil Falls respectively were documented by early photographers as popular picnic points for early settlers. As the city began to expand, bridges crossed over the creeks but by 1903, Fawn's Leap creek, Fawn's Leap, Tuttle's Brook, and Silver Cascade no longer appeared on maps. Bridal Veil Falls still remains, but has since been engineered into a stormwater pipe outfall.

D Silver Cascade

Silver Cascade, 1875

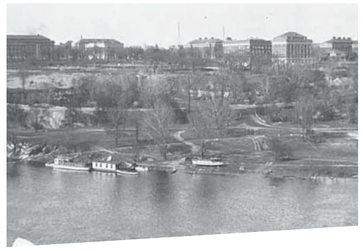
E Bohemian Flats



Minneapolis Municipal Terminal at the site of Bohemian Flats, 1949

Bohemian Flats, 1910

F Coffman Flats



Coffman Flats, 1928

H Bridal Veil Falls

Street work around Bridal Veil Falls, 1938

I Meeker Flats

Meeker Island, 1892

River Flats: Bohemian Flats, Coffman Flats, and Meeker Flats

The river flats within the District have also been largely modified due to changing land uses over the past 200 years, including industry, residential settlement, extraction, and storage. Early immigrants laboring in nearby breweries and mills built housing on Bohemian Flats starting in the 1860s. Two breweries operated on the Flats until the 1890s. In the 1930s the residents were forced to leave so that the city could build a barge terminal and coal storage yard on the low wide flats. In the 1980s, the city's terminal had moved above the Falls and the infrastructure associated with the terminal was removed so that West River Parkway could be extended along the Flats.

Around the time Minneapolis was first established, the flats below the University of Minnesota's East Bank were known as "Cheever's Landing". William Cheever, an early entrepreneur, established a boat landing here for incoming settlers. He built an observation tower looking over the landscape as a tourist attraction. In 1949, the flats were leased to the University of Minnesota to be used as a parking lot. In the late 1970s, the flats were used for the University's Showboat, a floating concert venue. In 2001, in cooperation with the University, the flats were redesigned and revegetated; the flats currently house the University of Minnesota's rowing teams.

Construction of Meeker Island Lock and Dam, south of Franklin Avenue Bridge, began in 1898 and finished in 1907. It operated for five years before being partially removed and inundated by the higher water level created by the building of Lock and Dam #1 near the Ford Bridge in 1917. Meeker Island, north of the Meeker Island Lock and Dam site, was also inundated with reservoir water or was removed from the river to accommodate river navigation. Near where the Island once stood is now Meeker Flats, which may have been created through the dumping of sediment dredged from the river. The Flats are currently part of the Mississippi Gorge Regional Park and provide habitat for many birds and animals.

Skating at Riverside Park, 1929

Riverside Park, 1905

G Riverside Park

Riverside Park, designed by Horace Cleveland in 1884, was one of the first parks designated by the Minneapolis Park and Recreation Board. The park was extremely popular in the early 1900s for active recreation, especially for kids. There was a toboggan run, playground, and ice skating. In the 1930s, the Works Progress Administration redesigned and built new park facilities, several of which still exist today. In the 1960s, the park was regraded and reduced in size to accommodate the construction of Interstate 94. It is currently in the process of being restored to its native vegetation by Friends of the Mississippi River.

Remnant Wetland Classification Table

1 Seasonally Flooded Basins and Flats

Vegetation is herbaceous plants and upland grasses, being non-woody and dying at the end of the season. There is no reed canary grass and no cattails. Water is around 6" when wet

Field Observations

Though type **1.1** is generally characterized by areas of grass and open fields, there is variation across the sites in terms of function and appearance. The 16 sites in the University District include constructed stormwater ponds in industrial, commercial, and residential areas, roadside vegetated areas, sites rehabilitated or planted with native vegetation, soccer fields and dog parks. Some of these sites are intentionally designed to improve water quality by retaining or filtering water, and others have a tendency to be seasonally wet but are used for different purposes.

There are three wet areas of type **1.2** in the University District, characterized by scrubby woods with several large, mature trees. One of the sites lies wedged between two industrial parking lots and railroad tracks, virtually inaccessible to pedestrians. The other two sites line East and West River Road, providing a visual wall of trees for the street. These areas are categorized as floodplain forests, seasonally wet areas that slow runoff water, provide groundwater discharge/recharge, infiltration, and some habitat as well as create an amenity for urban people.

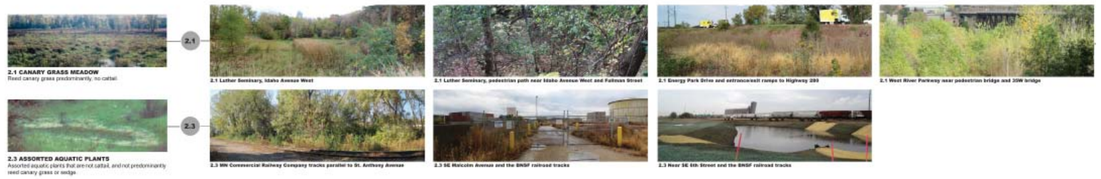
2 Inland Fresh Meadow

Vegetation is Reed Canary Grass and sedges, with no cattails or an insignificant amount of cattails present in the site. There is temporary water, though the soil usually has no standing water for most of the growing season. The soil is waterlogged within a few inches of the surface, and is normally dry in late summer. Water depth is 6" to 18" when wet

Field Observations

Type **2.1** has variation across the University District ranging from constructed wet areas along roadsides to more naturalized areas. Water levels fluctuate throughout the year in these sites, appearing dry in late fall. There is pedestrian access to three of the four sites, two of them located directly off of a pedestrian walking path on the Luther Seminary property, and one near West River Road. The fourth site buffers a parking lot from Energy Park Drive, likely recharging/discharging groundwater and filtering stormwater runoff in this historically wet area.

Type **2.3** wet areas appeared to be degraded and were inaccessible to pedestrians during field work. This type of wetland typically improves water quality and provides water recharge/discharge, some of which may be happening in these sites. However, they are tucked away in highly industrial areas and/or alongside railroad tracks, where their exposure to high pollutant and sediment loads in runoff likely impacts their ability to positively affect water quality.



3 Inland Shallow Marsh

Succession of cattails, sedges, and Reed Canary Grass make up the predominant vegetation, and there is often vegetative growth across the site. Water is temporary, either lasting up to midsummer, drying up completely, or remaining waterlogged the entire season. Water depth will be 6" to 24"

Field Observations

Type **3.1** wetlands typically protect water quality, retain stormwater, and provide habitat. In the University District the nine sites of this type vary: all but one of them are located directly adjacent to roadways, and the type of vegetation ranges from trees, cattails, and turf grass to native plants such as little bluestem, goldenrod, purple prairie clover, milkweed and aster. Many of these sites are narrow strips of vegetation that are difficult or dangerous to access as a pedestrian.

The four type **3.2** sites all include some areas of cattail marsh in addition to other vegetation. One of them sits in a basin that is surrounded on all sides by Highway 280 and its entrance/exit ramps, and is dangerous to access as a pedestrian. Another sits alongside the industrial Kasota Avenue, strewn with No Trespassing signs. The other two sites border parking lots in industrial areas. Wet areas of type **3.2** typically protect water quality, retain floodwater, and provide habitat.

4 Inland Deep Fresh Marsh

Vegetation is configured in a band surrounding or adjacent to a permanent body of water at some area of the site. Vegetation is composed of canary reed grass, sedges, and cattails or broadleaf plants bordering open water. Duckweed or a partial vegetative mat may be present. Water is present year-round, allowing submerged aquatic plants to grow. Water depth is 6" to 3'.

Field Observations

There are two type **4.1** wet areas in the University District, both constructed to protect water quality, detain stormwater, and create habitat. They are within close proximity of each other, in the industrial area near where Kasota Avenue turns to Elm Street. Only one of them appeared to have standing water, and both sites included native vegetation such as little bluestem, milkweed, and goldenrod. Willow trees, reed canary grass, and cattails were present in one of the sites as well. They were both adjacent to parking lots and roadways with truck traffic.

The single type **4.2** wet area in the district is located alongside railroad tracks, nestled between a small parking lot and the rear of several industrial buildings near Interstate 94 and Highway 280. There was no visible water at the time of field work, and several types of grasses were evident. This site is currently inaccessible to pedestrians, and can only be seen through the trees surrounding a small parking lot adjacent to a commercial building. Type **4.2** wetlands typically protect water quality, detain stormwater, and create habitat.

All six of these type **4.3** sites are located in industrial areas where there is heavy truck and train traffic. The wet areas of this type are mainly constructed stormwater detention ponds alongside parking lots and roadways, with the exception of the Kasota Ponds, two sites in the historically wet area surrounding Highway 280. The Kasota Ponds each provide 1.5 acres or more of habitat, including species of waterfowl and turtles which were both observed during fieldwork.

Visible standing water was observed in all but two of the type **4.4** wet areas in the district. The type of vegetation in these sites varied from trees to grasses to shrubs, and all but one were situated next to roadways or railroad tracks. The exception was a ponds on Luther Seminary property that may have received water from a nearby road, but was largely surrounded by woods and accessible by pedestrian path. Type **4.4** wetlands typically protect water quality, detain stormwater, and create habitat.

5 Various Types

There are two wet areas coded by the Metropolitan Mosquito Control District in the Granary Road trench running from the Stone Arch Bridge east to Highway 280. The corridor is currently occupied by BNSF railroad tracks and a service road, and is vegetated from the University of Minnesota campus to its outlet at the bridge.

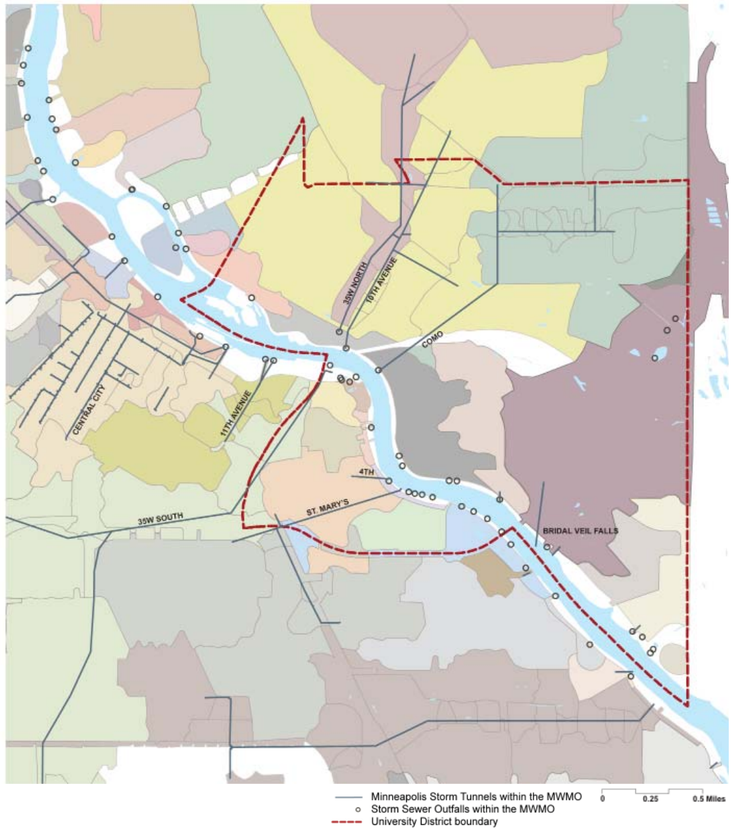
Field Observations

The two areas coded by the MMCD vary from **2.3**, an Inland Fresh Meadow with assorted aquatic plants, to **3.1,** an Inland Shallow Marsh, with canary grass and sedge. Recent construction has altered type **2.3**, which now appears to be open water with no vegetation. The remainder of the corridor has not been coded, though there is vegetation growing alongside the service road and railroad tracks that may be seasonally wet due to its historic drainage pattern and soil regimen.

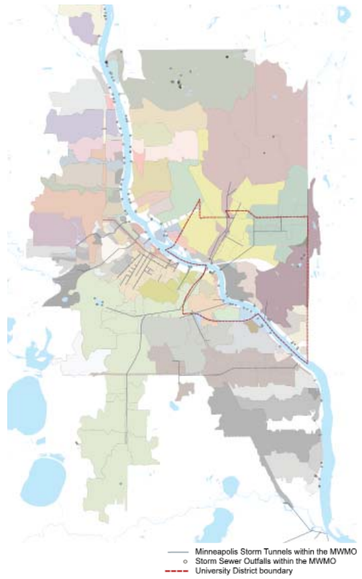
*The first number of the Metropolitan Mosquito Control District (MMCD) coding system classifies wetlands using the *Fish and Wildlife Service Circular 39* (Shaw & Fredine 1971), the second digit corresponds to their own devised system that refers to predominant vegetation type. Shaw and Fredine's *Circular 39* is one of the most common wetland classification systems used in Minnesota, and is also used by the Minnesota DNR. The *Circular 39* classification categories are: 1. Seasonally flooded basin or flat 2. Wet meadow 3. Shallow marsh 4. Deep marsh 5. Shallow open water 6. Shrub swamp 7. Wooded swamp 8. Bogs. There are no existing MMCD types 1.2, 2.3, 5, 6, 7, or 8 within the University District. Typology images were provided by the Metropolitan Mosquito Control District, published May 2009. Existing conditions images were taken by the Metropolitan Design Center during field work in October, 2011.

The Engineered Hydrology:
From Watersheds to Pipesheds, Fixed Pipesheds, Storm Tunnels, and Outfalls

The District's historic watersheds, originally defined by topography and drained by meandering streams, have since been completely reconstructed into pipesheds, a system of hard engineering that conveys water to the Mississippi via curbs, gutters, and underground pipes. The University District falls within the boundaries of the MWMO, meaning that stormwater in the District flows directly into the Mississippi River, mostly without treatment. Storm Tunnels are large underground pipes that collect stormwater from many pipes throughout a region and convey it directly to the river, so as to move water quickly in the event of a large rainstorm. The University District contains several storm tunnels, draining stormwater from Marcy-Holmes, Como, Prospect Park, and Cedar Riverside neighborhoods directly into the Mississippi River.



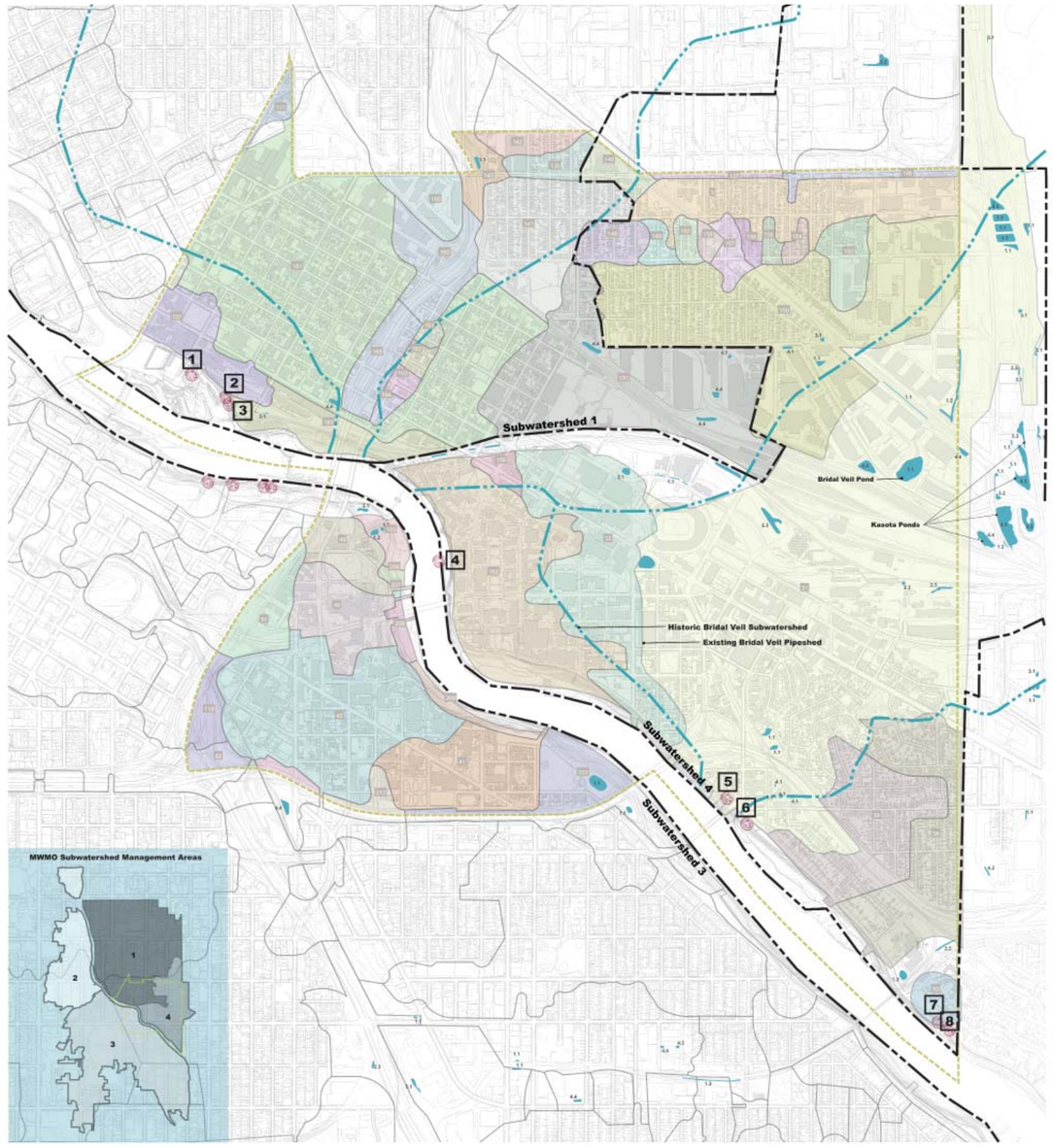
University District Pipesheds, Storm Tunnels, and Outfalls



MWMO Pipesheds Boundary

Given the extent to which the landscape has been altered for permanent settlement, watersheds have shifted based on major topographic alterations. These alterations are found in the forms of transportation corridors, residential and commercial developments, mining operations and, most clearly, the rerouting of waters through city pipeshed systems.

Mississippi Watershed Management Organization
Historic Waters of the MWMO



District Hydrology: Watershed, Pipesheds, and Wetlands

Legend

MWMO Historic Subwatersheds - Illustrating historic surface water drainageways. (Source: MWMO 2011 Watershed Management Plan)

MWMO 2010 Subwatershed Management Areas - These management areas were designated based on (1) existing pipeshed boundaries, (2) potential greenway corridors based on existing land cover, (3) MWMO boundaries, and (4) existing pervious areas. They will be used by the MWMO in assessing watershed degredation, opportunities for watershed improvements, and potential projects. (Source: MWMO 2011 Management Plan)

MWMO Pipesheds - Many of the streams, lakes & wetlands in the Mississippi Watershed have been buried, filled, or drained through the course of urban development. Today a series of pipes & tunnels have been put in place to collect & convey stormwater downstream. (Source: MWMO 2011 Watershed Mgt. Plan)

210 **MWMO Pipeshed ID -** Number from tabular information associated with a GIS (Geographic Information System) pipeshed file provided by the MWMO. The number is not a code, but a Feature ID (FID) associated with the GIS file "Existing Pipesheds," and usable in evaluating further pipeshed attributes.

MWMO 2009 & 2010 Springs along the Mississippi River Corridor

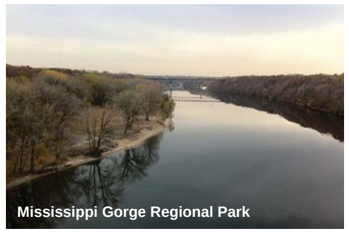
1.1 **MMCD Wet Areas -** A combination of constructed and natural wetlands, serving a variety of functions e.g. stormwater treatment, wildlife habitat, recreation, aesthetic value, etc.

Mapping the Remnant Landscape: Minnesota Land Cover Classification

West River Parkway, part of Central Mississippi Riverfront Regional Park

Theodore Wirth Regional Park

Kenilworth Trail



Mississippi Gorge Regional Park

Existing Vegetation: Land Cover Classification

The Minnesota Land Cover Classification System (MLCCS) is a natural resource inventory classification system developed in 2004 by the Minnesota Department of Natural Resources to accurately map land cover types. This classification system was used to classify land cover in Minneapolis by the Mississippi Watershed Management Organization (MWMO) in 2008 and this report follows this classification.

The classification system is composed of a five-level hierarchy. Each level of the system represents an increased level of detail in land cover classification, with Level 1 being the most general and Level 5 being the detailed. The MMWO classified each parcel of land (polygon) within their study area to the most detailed level possible (Levels 3, 4, or 5). The most general level, Level 1, divides land cover types into either Natural/Semi-Natural cover types; such as Forests or Water, or Cultural cover types, such as Artificial Surfaces or Cultural Vegetation. Level Two identifies the dominant vegetation, such as Deciduous Forest, for Natural/Semi-Natural cover types or Cultivated Herbaceous for Cultural cover. Level 3 identifies plant types, such as Upland or Row Cropland. Level 4 identifies more detailed information about imperviousness, soil type, or a more specific DNR Natural plant community classification type, depending how the polygon was classified in previous levels. Level 5 identifies specific plant communities or species, such as Crop Species or Oak Forest Dry Subtype.

Mapping the MLCCS Level 1 Natural or Semi-Natural Land Cover and the Cultural Land Cover found in the University District begins to define the types of landscapes found in existing open space, as well as illustrate where potential future open space or connections (greenways) between them could be located. Additional information for land cover types, such as more specific classification levels, can be found in the MWMO's 2008 report "A Mississippi Watershed Management Organization Watershed Assessment: Natural Resources Inventory & Minnesota Land Cover Classification System Mapping" and corresponding GIS data layer.

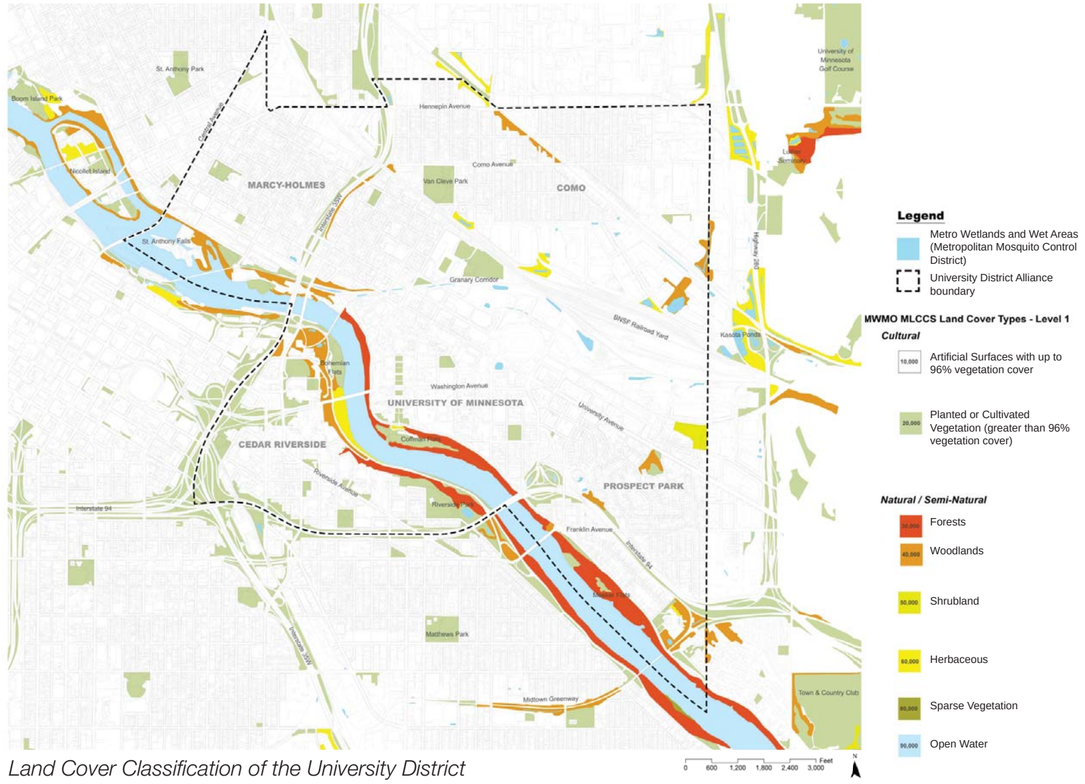
Regional Parks, Trails and Greenway Corridors

The parks and open space within the University District feature a number of regional parks and trails along the Mississippi River gorge. However, we also wanted to know if there is a larger regional network of parks and trails to which a University District greenway network could connect. The research gathered GIS layers and information about regional parks and trails, and potential habitat corridors from state and regional organizations --primarily the Minnesota DNR's Metro Conservation Corridors program. The Metropolitan Council provided information about regional parks and trails. Recreational open space in the Twin Cities seven-county metro region includes the Regional Park System, as well as other state, federal, and private recreationally-oriented open space. As such, the Regional Park System includes 54,633 acres of open space and 231 miles of trails for public use, made up of land owned and maintained by cities, counties, and special park districts with support from the Metropolitan Council. In an effort to guide counties and local governments as they prioritize areas for conservation and restoration, the DNR developed a metropolitan network of greenway corridors linking Regional Parks, based on connecting specific patches of ecological significance.

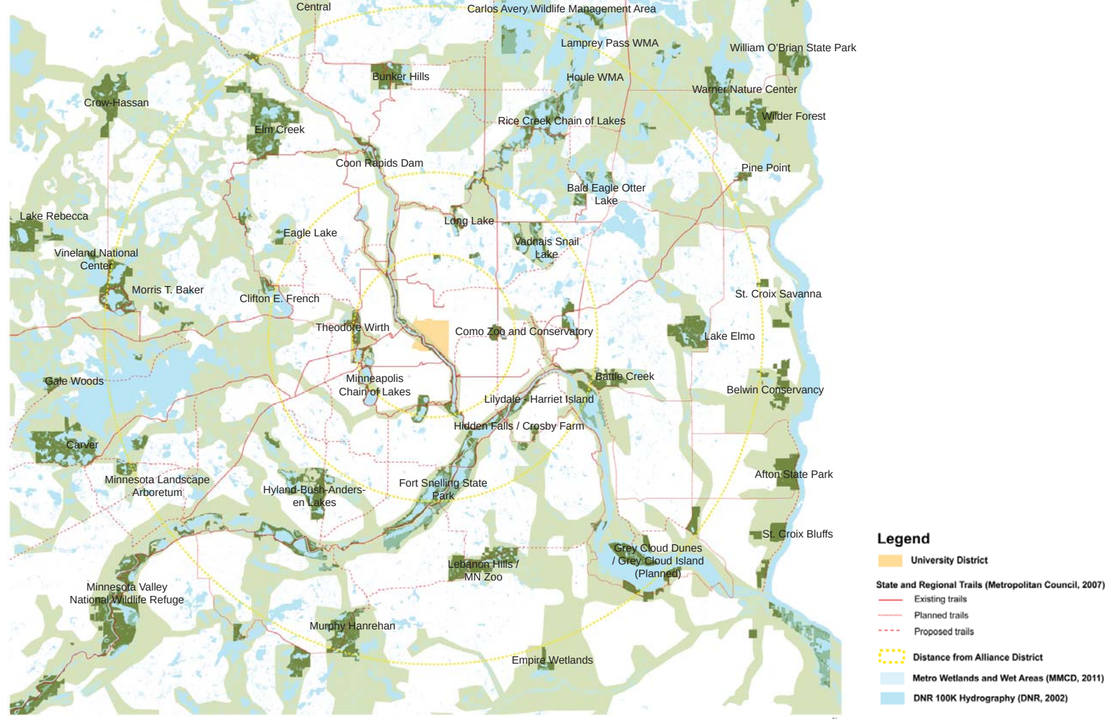
The regional trail system… is complemented by shorter, local trails, which may eventually feed into units of the regional trail system. The opportunities for interesting trail recreation experiences are substantially enhanced where local trails intersect with or are reached by elements of the regional system".

Metropolitan Council's 2030 Regional Parks Policy Plan

Today, the regional map reveals a patch-system of greenway corridors and trails well outside the University District. In a 20-mile radius from the District's center there are 104 square miles of open space. Many of these natural resources are connected by existing trails and the DNR's Metro Conservation Corridors is working on a plan for additional greenway connections. Once it becomes implemented, it would create a vast network of linked habitats and natural resources accessible to the Metro population and could attract visitors from around the world. Yet, as we get closer to the University District, and the urbanized area becomes well established, access to these networks of regional trails and greenway corridors becomes more difficult.



Land Cover Classification of the University District



Twin Cities Regional Parks and Trails with DNR's Greenway Corridors

To create the walkable city in the automobile age emphasis will need to shift from almost total auto orientation, to acceptance and promotion of pedestrian and bicycle at all levels. The regulatory environment will need to shift toward encouragement of walkability, and the design and planning professions will need to work toward the creation of integrated pedestrian access at all scales of movement.

Michael Southworth
Journal of Planning and Development

Connecting Human Mobility Corridors to Greenway Corridors

The preceding pages have provided an inventory of data relevant for understanding the urban landscape of the District as a repository of hybrid remnant landscapes that can help in weaving important greenway corridors connecting to the Mississippi River. But because of the fragmented nature of these potential greenway corridors it was necessary to understand, from the community's perspective, current mobility patterns used more frequently throughout the district linking components of natural and semi natural landscapes with popular trails, bicycle paths, right-of-ways and favored street corridors. These mobility corridors represent the community's most common and idyllic mobility paths used in every day life.

To uncover these human mobility corridors within the District, the Metropolitan Design Center conducted a workshop with each neighborhood. Each workshop participant was asked to map their existing walking and biking routes through the neighborhood, as well as routes that do not currently exist but that participants would prefer. Each participant's route was digitized and then all mobility routes for that neighborhood were layered on top of one another to create a synthesized map indicating overall neighborhood mobility. Participants were also asked to comment on the various issues obstructing mobility (barriers) and to offer suggestions to improve mobility within their neighborhood. Comments were documented and categorized according to specific location.

The resulting data indicated various degrees of difficulties connecting within and between neighborhoods and the river. Mobility among neighborhoods is interrupted mainly by trenches corresponding to freeway corridors, primarily I-35W and I-94, and by the multiple alignments of rail lines and their specific right-of-ways. Access to the Mississippi River varies with topography caused by different degree of erosion of the river channel and by the different modifications made to the water level through the different stages of hydrological modifications.

In general, comments from the workshop participants indicated where problem areas exist within the neighborhood limiting access and connectivity. In this way the research was able to identify additional "contested territories" at a smaller neighborhood scale. Workshop participants indicated a desire for an overall improved access to the river's waterfront, improved mobility along the entire length of the Mississippi, and for developing a network of greenways that allows the District to connect with the city's existing open space corridors and important open space destinations.

The expression 'CITY' and 'urban agglomeration' are commonly used as if they were interchangeable. But there are differences of a more qualitative nature between the two expressions...The spirit of a real city has subtle qualities more difficult to understand—let alone to create at will—than the quantitative aspects of an urban agglomeration. Planners are primarily concerned with the technological efficiency of the urban system…They pay less attention to the psychological and emotional needs of city dwellers or to the relation between city life and civilization.

René Dubos
Beast or Angel

Community Meetings and Workshops

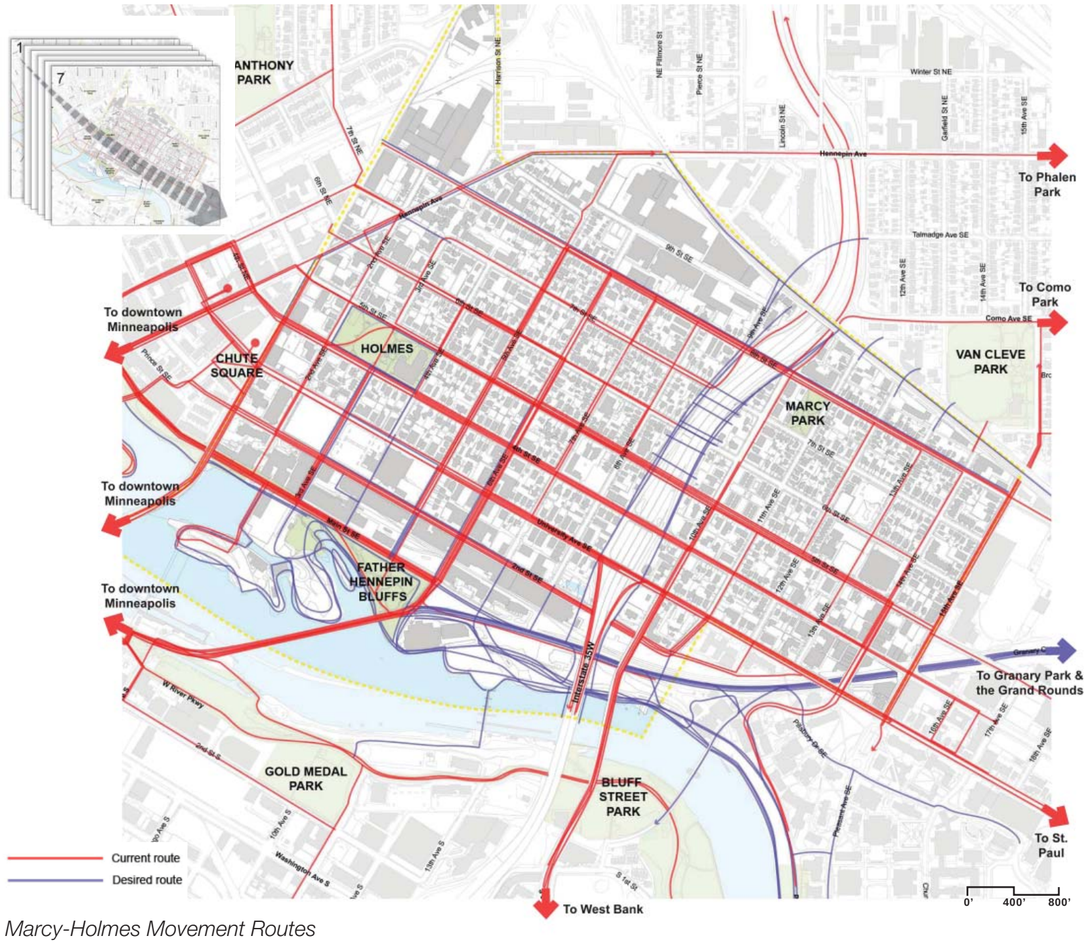
The Promise of Marcy-Holmes: Mobility Issues & Opportunities

Marcy Holmes Workshop

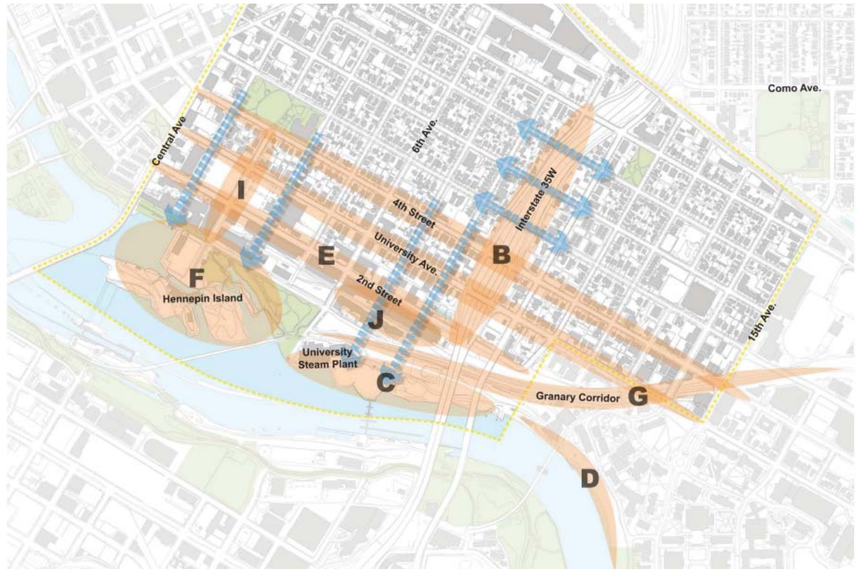
The potential East-West mobility within the Marcy-Holmes neighborhood has never been realized due to the void created by the I-35W trench, and the industrial structures along Second Street that block access to the riverfront. Residents also indicate that the busy one-way streets, 4th and University Ave, leading to I-35W, block safe pedestrian access to the Riverfront and to the vibrant Main Street historic corridor. Second Street was brought under scrutiny for its strategic connection to the University and to Minneapolis downtown area.

The future of Granary Corridor was once again a concern to the residents as to the possibility of becoming a University truck route, which will further fragment the community and bring additional unwanted traffic to the neighborhood. Instead, residents indicated an interest in extending a trail through Granary Corridor –the previous alignment of Tuttle's Brook and currently the location of a partially abandoned railroad trench running through Dinkytown--which would ultimately connect a series of critical districts, landmarks, and corridors, such as downtown Minneapolis, the Stone Arch Bridge, the Mississippi River, the University campus, and the Grand Rounds Scenic Byway.

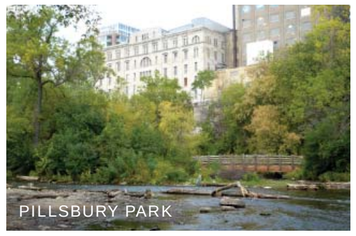
The relatively flat land along the waterfront edge from Main Street to I-35W Bridge offers the promise of a new recreational open space corridor, providing access to currently inaccessible sections of the River gorge bluff, which are said to be prime fishing spots. Extending this open space --the missing link-- along a boardwalk connecting with the University's Coffman flats will provide a continuous access to the Mississippi River eventually connecting with the "natural" environment of Meeker Flats.

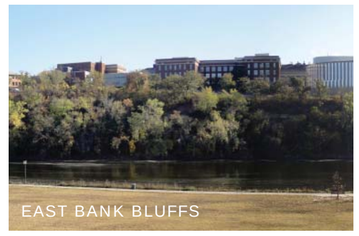


Marcy-Holmes Movement Routes



Marcy-Holmes Conflicted Areas





Marcy-Holmes Comments

		Current problems	Ideas for improvement
A	**River (general)**	• Cannot see the river from the neighborhood until one arrives at 2nd Street.	• "Continuous access to the River from NE to Prospect Park should be possible." • "Access to the River from waterside level to treetop level should be possible." • "A river level amphitheater is essential." • Include interactive art pieces and interpretive signage along the river. • Provide "family-friends activities on weekends with learning opportunities for the kids.. • "The more different ways of experiencing the river, the better."
B	**Interstate 35W**	• Neighborhood is physically split in two by 35W. • The only current link is an unpleasant pedestrian bridge along 5th Street.	• **A land bridge could connect the two sides of the neighborhood over I-35W.** • Empty lot between 35W bridge and 10th Ave. at University Ave could be redeveloped as a gateway to the neighborhood and the University.
C	**River edge below 35W bridge and UM Steam Plant**	• No current access.	• Would like this to be **accessible public space**. • Access to the river on the east bank under the 35W bridge could be similar to that on the west bank. • I would like to get "close to the river" here and to be able to "walk between the big glass windows of the U Power Plant and the Mississippi River". • Could have a performance space underneath the 35W bridge, using the landscape of infrastructure to form a natural amphitheater.
D	**River edge below University**	• No current access. • Narrow river edge.	• A boardwalk along the river could **connect this area down river to Coffman Flats**.
E	**2nd Street SE**		• "Develop 2nd Street SE from 2nd Ave. south to Dinkytown." • Second Street is an important street because you can see the river from here. • Second Street currently has a varied mix of development (residential, art, industry) - it has potential for more neighborhood amenities (commercial).
F	**Hennepin Island & River edge along Main Street**	• Limited access to the river here.	• "More access to the river from Main Street north of the Stone Arch Bridge where there are steps that are difficult to use." • Would like to get out over the river, similar to the cantilevered lobby (the "Endless Bridge") at the Guthrie Theater, near St Anthony Main. • Water Power Park should be open all year. • Would like increased access to river edge on Hennepin Island.
G	**Granary Corridor**		• Would be nice to walk the top of the bluff. • "Connect Granary [Corridor] to Dinkytown".
H	**4th Street/University Ave**	• "There are always confrontations between car traffic and pedestrians and bikes" along these corridors. • Difficult and dangerous for pedestrians to cross 4th and University to reach the river.	• Perhaps return both streets to 2-way directions.
I	**3rd Ave SE**	• Along 3rd Ave. there are currently empty blocks "which do nothing to link the neighborhood to the river."	• Would like gardens and sculptures along connecting streets.
J	**7th Ave/8th Ave**	• Metal-Matic property currently blocks neighborhood access to river from 7th Ave and 8th Ave.	

Marcy-Holmes - Greenway Network

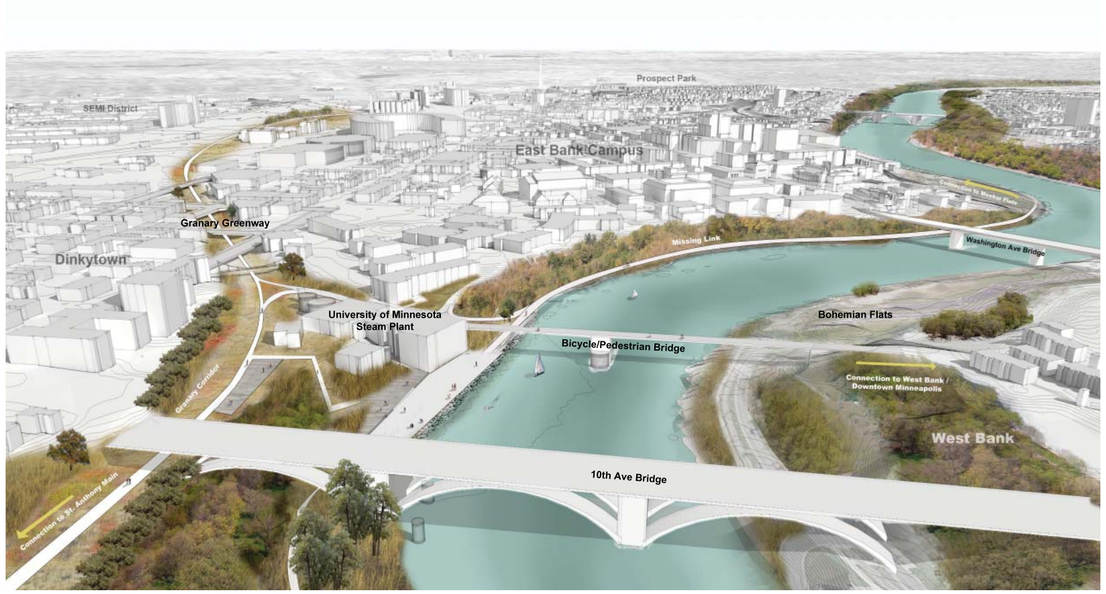
1. City Park --------> Granary Corridor --------> Father Hennepin Park --------> St. Anthony Main
2. Prospect Park --------> University Campus --------> University Ave SE --------> Northeast Minneapolis
3. Granary Corridor --------> 5th St SE --------> Holmes Park --------> St. Anthony Park
4. Bierman Fields --------> 8th St SE --------> Monroe Ave NE
5. 6th Ave SE --------> Stone Arch Bridge --------> Downtown Minneapolis
6. West Bank Campus --------> 19th Ave SE --------> 10th Ave Bridge --------> 10th Ave SE --------> Como Ave SE

Water Infiltration

"We are a lucky neighborhood to have direct access to the river."

- Marcy-Holmes Workshop participant

Marcy-Holmes / Dinkytown Landbridge



Granary Greenway Corridor and the Missing Link

Occupying the Void: Transforming the Character of Granary Greenway Corridor

dinkytown plaza

- existing building
- new campus building
- ramps leading into trench
- Dinkytown level plaza

farmer's market

- permanent farmer's market sheds
- space for temporary farmer's market stands
- new student housing
- bike/ running path
- high density housing
- views to downtown
- permeable paving system

sidewalk level

- extension off of Annie's Parlor
- sidewalk level access
- new trench level building

under bridge

- commercial spaces
- outdoor plaza areas
- trolley stop
- bike/ running path
- existing bridge structure
- electric trolley system
- boardwalk over train tracks

trench access

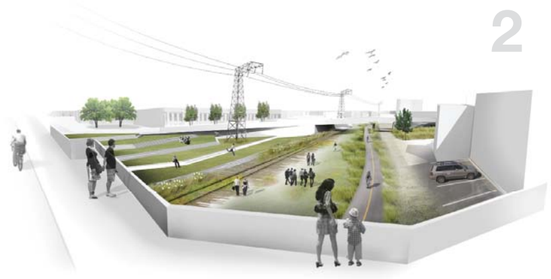
- new student housing
- trench access ramps
- boardwalk
- permeable paving system

trench activity

- commercial space
- electric trolley
- trench level housing
- high density housing
- outdoor eating spaces
- permeable paving system

Occupying the Void: Granary Greenway Corridor Infill

Access to Granary Greenway Corridor from 5th St Bridge Looking East



Access to Granary Greenway Corridor from 15th Ave & 5th St Looking East

Access to Granary Greenway Corridor from Pillsbury Dr & East River Road Looking Southwest

Creating Access to Granary Greenway Corridor

City Park and Granary Greenway Corridor Looking West toward Downtown Minneapolis

Granary Greenway Corridor Plan

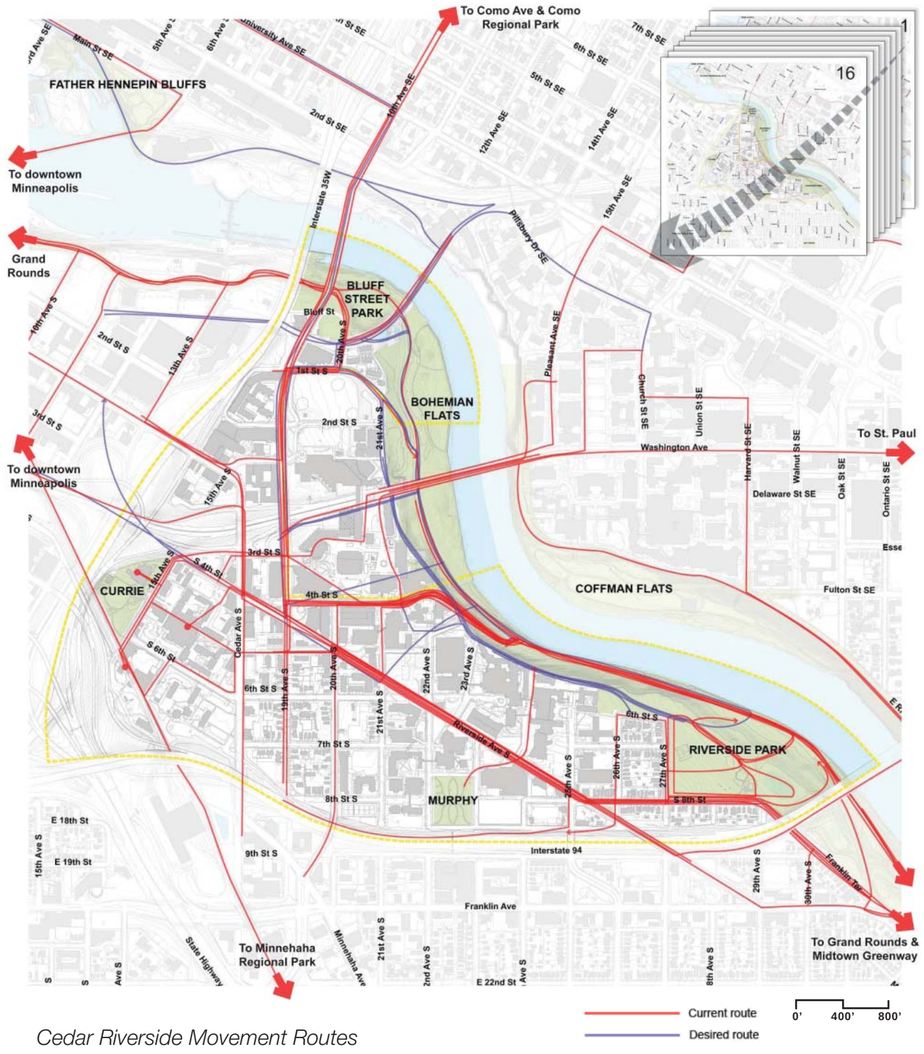
City Park and Granary Greenway Corridor Looking East toward St. Paul

The Promise of Cedar Riverside:
Mobility Issues & Opportunities

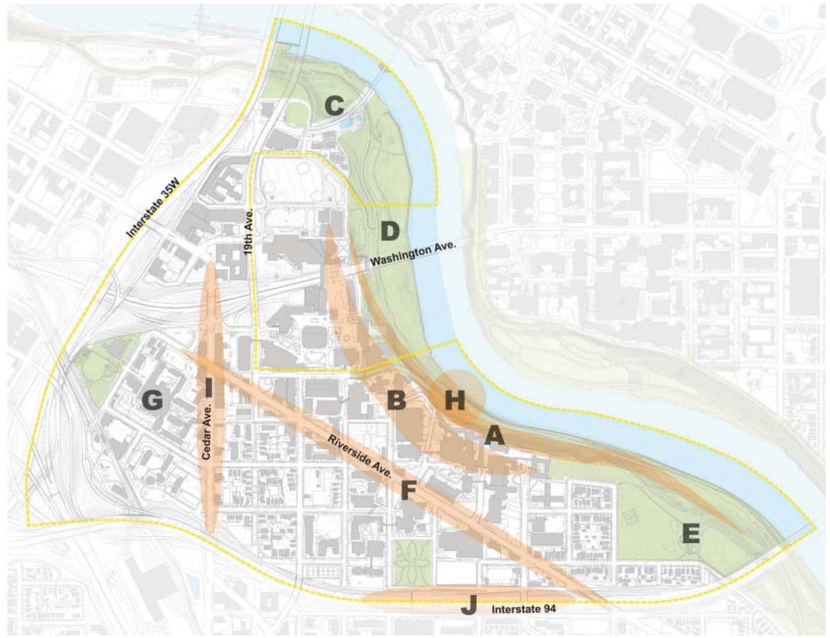
Cedar Riverside is located on the west bank of the meandering Mississippi River and as such, physically detached from other neighborhoods in the District. Topographically, Cedar Riverside sits on top of a prominent bluff featuring fantastic views over the river gorge. Along the edge of the bluff the University of Minnesota spreads with large institutional buildings creating a distinct barrier between the Cedar Riverside community and the Mississippi River.

Neighborhood residents indicated an interest in accommodating cultural events on Bohemian Flats—a broad flood plain along the river with significant recreational opportunities. Yet, proper access is challenging due to the steepness of the bluff and the need for crossing University buildings along poorly defined circuitous paths and open spaces.

Cedar Riverside's main mobility route, Riverside Avenue, cuts diagonally through the street grid, creating multiple "lost spaces" that are not currently benefitting the community. Yet with a bit of planning and design skills these lost spaces can provide multiple "pocket parks" which would change the character of the street and ameliorate pedestrian mobility while reducing the safety hazard of crossing the street. The vibrant commercial district along Cedar Avenue suffers from narrow sidewalks that should be improved for pedestrian mobility creating a welcoming environment while stimulating commercial activity.



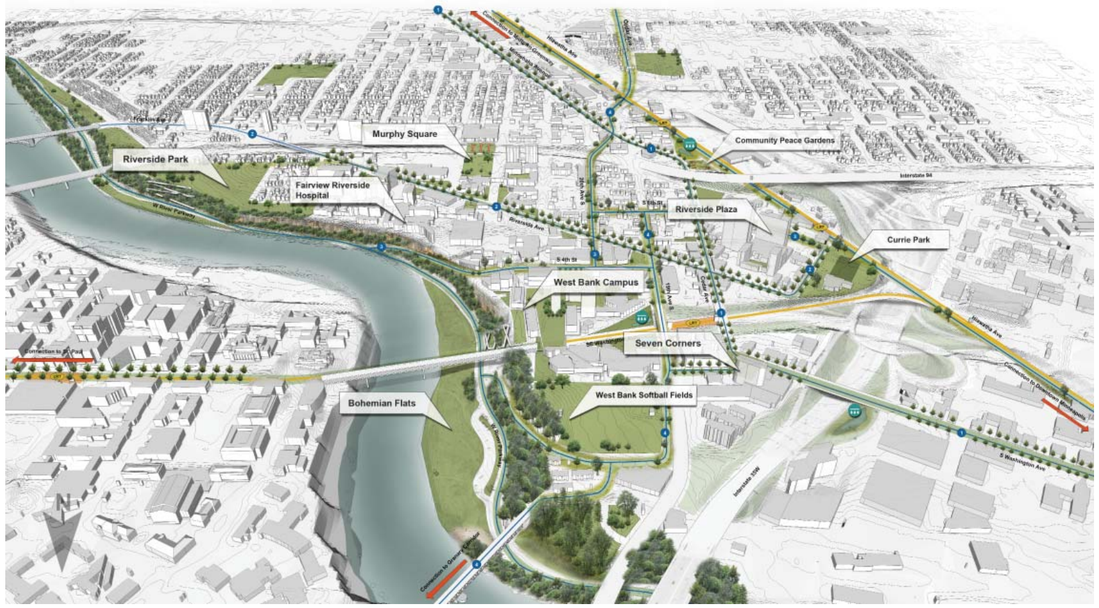
Cedar Riverside Movement Routes



Cedar Riverside Conflicted Areas

Cedar Riverside Comments

	LOCATION	CURRENT PROBLEMS	IDEAS FOR IMPROVEMENT
A	**River bluffs**	• The river bluffs and the retaining walls along the river bluffs are a barrier. • River flats don't always feel safe. • Problem with flooding along flats. • "[Bluffs below U-MN's east bank] isn't the best right now. How to make it more attractive and appealling?"	• "Gorge and institutions [should] make a path that is accessible to [neighborhood]". • Better lighting needed along parkway. • **An upper trail along the bluff, behind Fairview hospital, "might be more scenic".** • Steps needed along bluffs below U-MN's east bank, that are maintained and accessible.
B	**University of MN**	• "Easy access from the neighborhood to the river is blocked by U of M and hospitals".	• The area where Cedar Ave. meets Washington Ave. could become an open space, and then a corridor could extend from there, along Washington Ave., to the river.
C	**Bluff St. Park/Pedestrian bridge**	• Contamination in this area.	• **Pedestrian access from bridge to river edge "would be nice"**. • Native prairie restoration at overlook. • Bike path from Bluff Street Park in tunnel under 35W to downtown.
D	**Bohemian Flats**		• Open space on flats could be site for "open-air events and gatherings". • "Keep grass and openness due to flooding". • "Create open air amphitheater for performances, such as concerts". • There could be restaurants along the bluff overlooking the river. • Sculpture and other art needed in neighborhood near river. • Playground.
E	**Riverside Park**	• **Stairs between upper park and lower park need repair**. • Riverside Park could be an ecological/educational park.	
F	**Riverside Avenue**	• Inadequate transit system. • Bicycle lane markings are confusing and dangerous. • Lots of **traffic and congestion feels unsafe for pedestrians**, especially at 25th and Riverside.	
G	**Riverside Plaza**	• The plaza has a large population concentration - especially many families with small children - that needs access to the river.	
H	**4th Street access to river**	• Fourth street to the river "is straight forward but not a pleasant walk" due to the slope of the street and the vehicle traffic.	
I	**Cedar Avenue**	• Narrow sidewalks. • Lots of traffic - can be dangerous for pedestrians.	
J	**Interstate 94**	• Not a pleasant place for pedestrians to move across.	

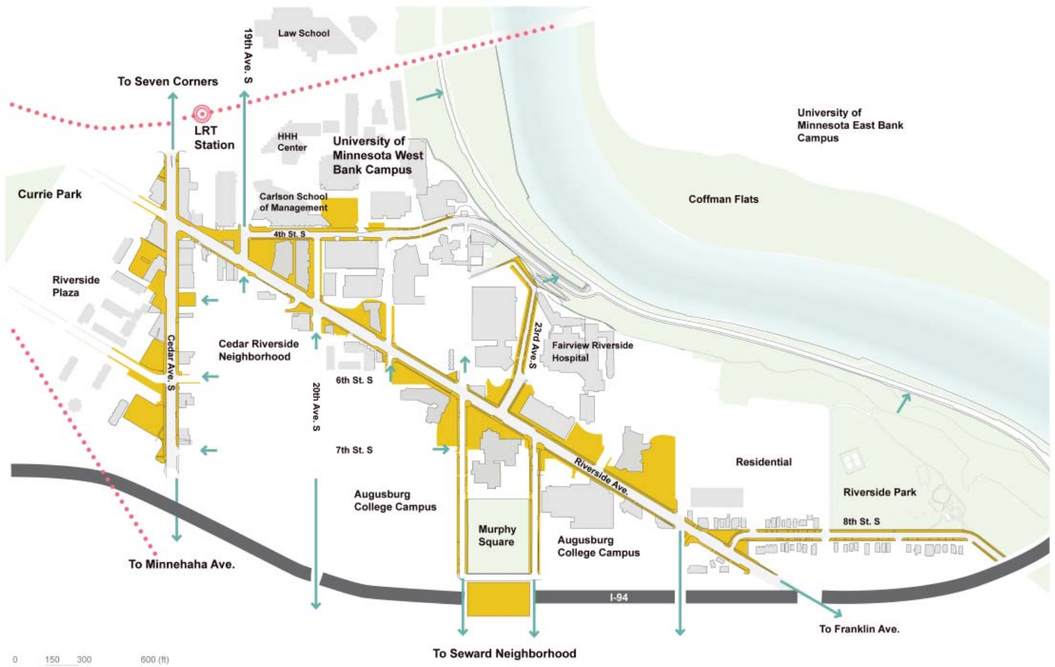


Cedar Riverside Greenway Network

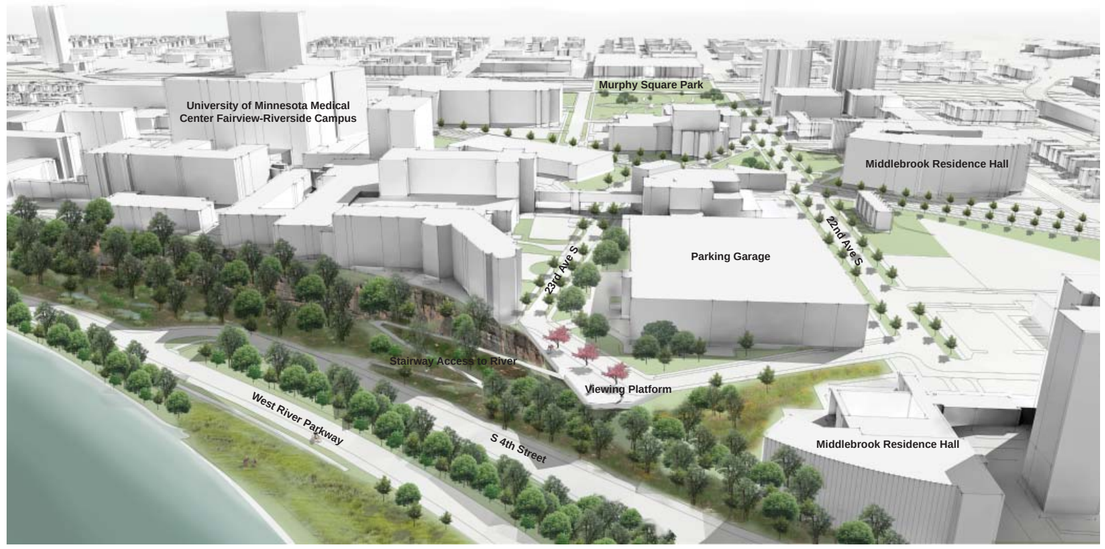
1. Minnehaha Ave --------> Cedar Ave --------> Washington Ave
2. West Bank LRT Station --------> Riverside Ave --------> Franklin Ave
3. S 6th Street --------> 20th Ave S --------> S 4th St --------> East River Road
4. Hiawatha Trail --------> 20th Ave S --------> 19th Ave S --------> Pedestrian / Bicycle Bridge

Water Infiltration Basin

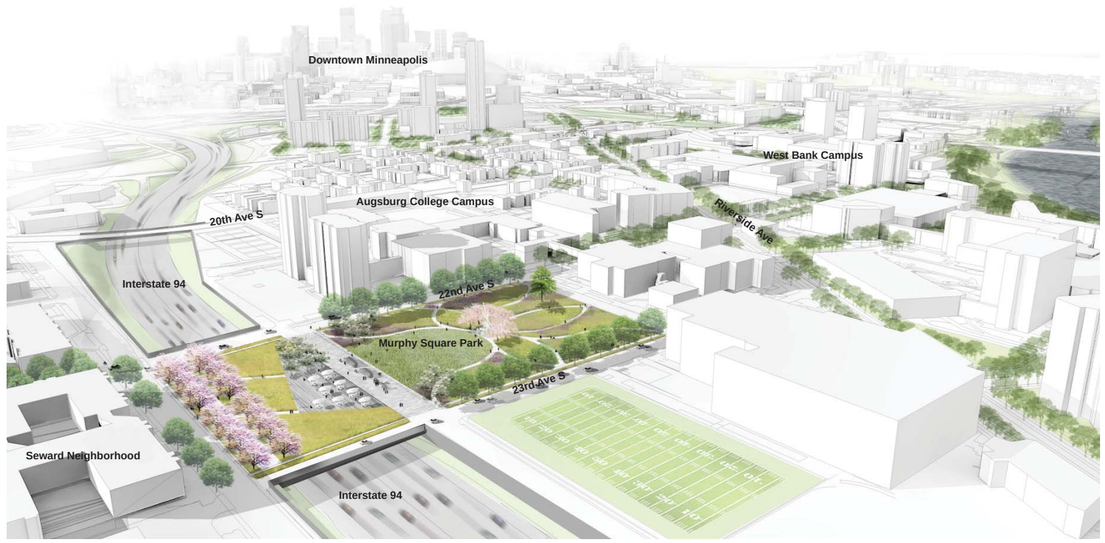
LRT — Light Rail Transit Station



Riverside Avenue Pocket Greenspaces



Riverside Overlook and Stair Access

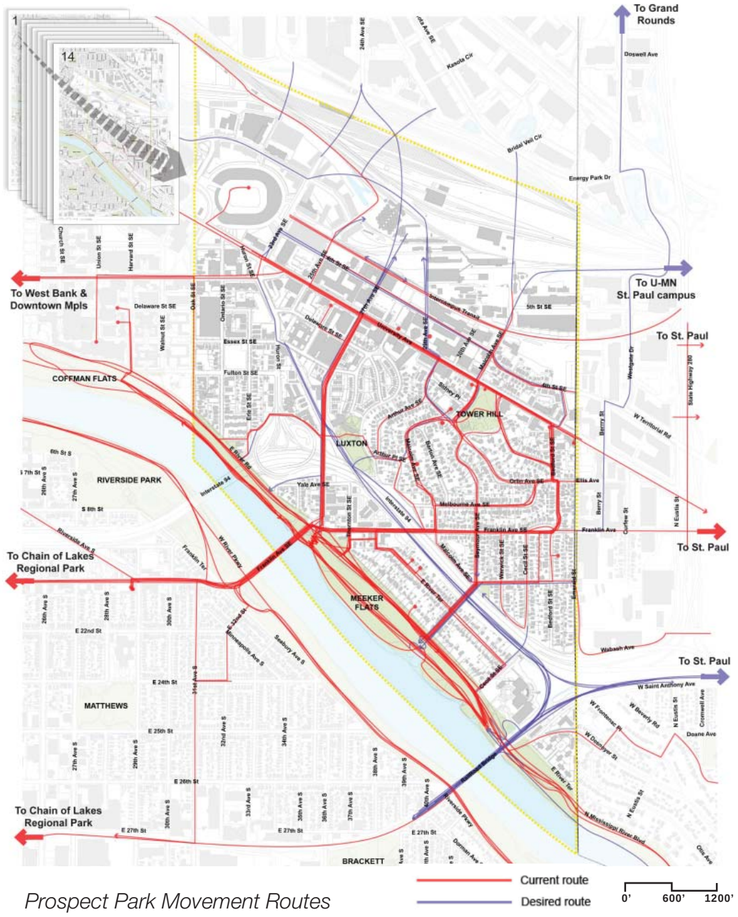


Murphy Square Land Bridge over Interstate 94

The Promise of Prospect Park: Mobility Issues & Opportunities

The land comprising Prospect Park is a predominantly hilly terrain and the neighborhood is split into three or four distinctive zones due to the deep trench created by Interstate I-94 and the high-traffic arteries of University Avenue and Huron Boulevard. Neighborhood residents report that the narrow pedestrian bridge over the I-94 freeway feels frightening, noisy, and unpleasant and the steep bluffs of the Mississippi River at this location require a much better access than the existing fragile wood-staircase adjacent to Franklin Bridge.

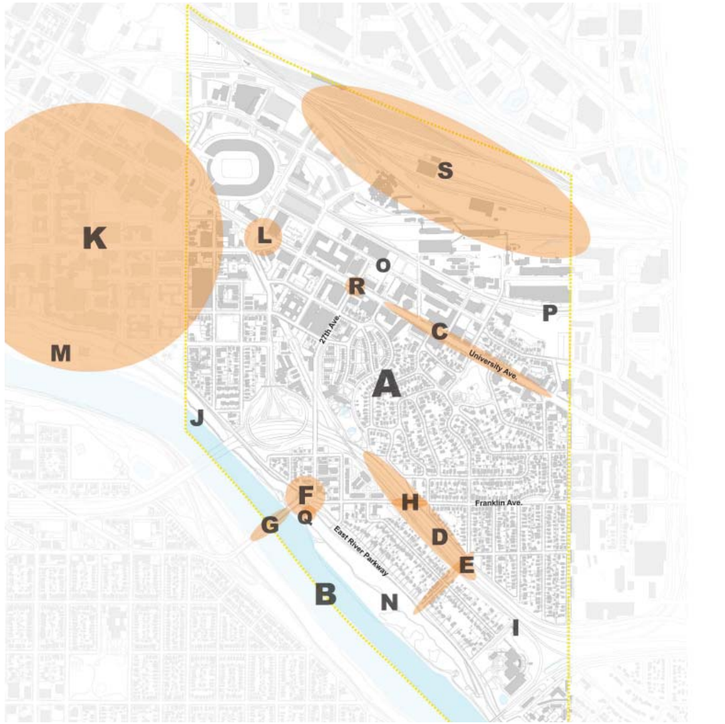
Additionally, the expansive railroad yards at the northern neighborhood boundary prohibit any crossing, thus cutting Prospect Park off from Como neighborhoods to the north. Many residents requested an additional access point to the river where Seymour Place meets the East River Parkway. And they showed an interest in creating a new greenway corridor and trail along an existing (and partially abandoned) railroad line which eventually would link with the railroad bridge connecting Prospect Park to the existing Greenway Trail that runs the length of South Minneapolis.



Prospect Park Movement Routes

Prospect Park Comments

		Current problems	Ideas for improvement
A	Neighborhood (general)	• Neighborhood does not have a large gathering space for events. • Some neighborhood streets do not have adequate sidewalks: 27th Ave., 4th St. SE, Malcolm Ave.	• "The more water, green, the better". • Give remnant pieces of land to adjacent property owners to maintain and pay taxes on. • Would like "dedicated sidewalk bike lanes like they do in some German cities" (cycle track?).
B	River (general)	• The river flats can feel "scary" and "isolated" - "security is a big issue".	• Concerned that future designs may bring more people to the river, which may discourage wildlife from returning. • Could have a boat parade on the river, like they used to do during the Aquatennial. • Have trails that go down bluff parallel to the river (switchback?) - would feel like you are in the treetops. • "Along the bluff, add higher paths that are groomed gravel". • A network of pathways could come across the freeway to lookout points along the river.
C	University Avenue	• A barrier for the neighborhood - too wide to cross, noisy, "too much traffic", dangerous and "ugly to walk along", "no trees". • Dangerous for bikes to ride on street, dangerous for pedestrians when bikes ride on sidewalk.	• Development around the LRT stops is crucial to creating a pedestrian environment. Will the LRT make it better or worse? • Introducing "complete street" design and planning concepts on Univ. Ave. could create better ped. environment
D	Interstate 94	• Freeway is a "big barrier"	• A land bridge over 94 "would be nice".
E	Pedestrian bridge over I94	**• The pedestrian bridge over I94 is not a pleasant place to cross. Too noisy!**	
F	Franklin/East River Parkway intersection	**• Franklin/West River Parkway is difficult and dangerous intersection for bikers and pedestrians. Many residents avoid it.**	
G	Franklin bridge over Mississippi River	• Pedestrian space too narrow - not pleasant.	
H	Franklin bridge over I94	• Too wide - cars speed down.	
I	Canadian Pacific Railroad		• The RR ROW along I94 could be made into a walking/biking path, crossing the river on the RR bridge to connect to the Midtown Greenway in Minneapolis. It could also connect up to the University where the RR ends near Huron or also follow the RR ROW east into St. Paul.



Prospect Park Conflicted Areas

Prospect Park Comments

J	River walkway under Franklin bridge		• People fish here for bass - would be nice to have a pier or rocks to walk out on into the river below Franklin bridge.
K	University of Minnesota campus	• Campus is a barrier for bikers - many bike routes leading to campus but not through. • Campus is becoming too auto-oriented. • Some areas on campus are hostile to pedestrians (indicated along Harvard and Oak, south of Washington Ave. - here there is "no streetscape". "Needs to have walk-only light for pedestrians" at intersection of Delaware & Harvard. • Campus is like a medieval city, in that it feels walled off from its surroundings.	
L	Intersection of Huron/Washington/ University	• "Awful! Not enough left turn space". • Intersection indicated as a "critical intersection".	
M	Coffman Flats	• The river flats can feel "scary" and "isolated" - "security is a big issue".• Stairs get icy in the winter. • "Underutilized". Current use is for parking.	• "Needs a looping walkway up the bluff". • This could be an "activity area" with "more things to do near river". • "Would love a soccer field!".
N	Meeker Flats	• The river flats can feel "scary" and "isolated" - "security is a big issue".	• Connection needed from Seymour Ave down to river edge. • Would like to keep this area feeling "wild" and "quiet". • Large picnic area?
O	4th Street (east of stadium)		• Could have bike lanes.
P	University Transitway		
Q	Stairway to Meeker Flats	• "Awful". • Gets icy in the winter. • "Underused".	
R	University Ave & 27th Ave. S.	• Indicated as a "critical intersection".	

Prospect Park Greenway Network

1. **Essex St Se ------ > Luxton Park ----- > I-94 Right of Way ----- > Chergosky Park -------- > Midtown Greenway**
2. **City Park ----- > Malcolm Ave SE ------ > Tower Hill Park ------ > Seymour Ave SE------ >Chergosky Park ------ >Meeker Flats**
3. **City Park ------ > 27th Ave S ------ > Bridal Veil Falls ------> Meeker Flats**
4. **Tower Hill Park ------ > Bedford St ------- > 4th St SE**
5. **Granary Corridor**
6. **East River Road Parkway**

"The freeway is a big barrier - [the pedestrian bridge] is not a pleasant place to cross."

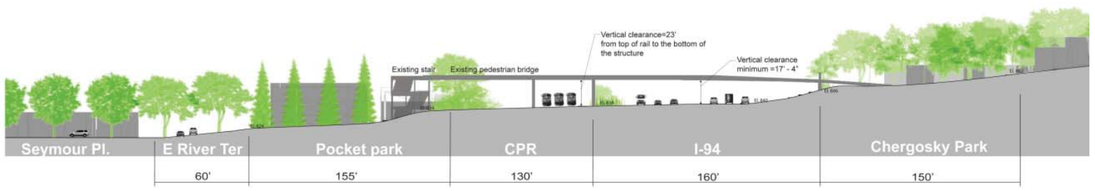
- Workshop participant

Grand Rounds "Missing Link"

Chergosky Park Land Bridge over Interstate 94 and Canadian Pacific Rail Line Greenway

Canadian Pacific Rail Line Greenway With Existing Rail Line

Canadian Pacific Rail Line Greenway Without Existing Rail Line



The Promise of Como: Mobility Issues & Opportunities

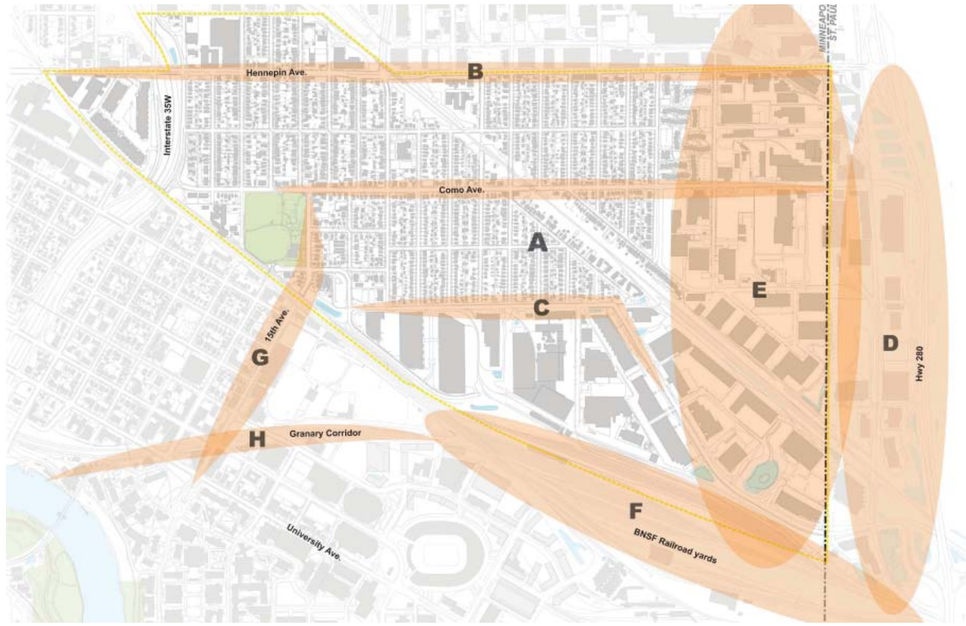
Of all the District neighborhoods, Como has the most challenging issues of mobility. Completely surrounded by widespread industrial land use, it is isolated from the rest of the District. There is limited opportunity for new open space within its compact development and it is the only District neighborhood that does not border the river. Fifteenth Avenue is the only mobility route to the south, but the narrow neighborhood street was not built to handle all the industrial traffic as well as the pedestrian and bike traffic associated with the University student population.

The Minneapolis Park Board's Grand Rounds "Missing Link" is planned to transverse the Como neighborhood along the eastern portion to connect the existing parkways in northeast Minneapolis south to the Mississippi River, but the location has not been determined. Many residents indicated an interest in revitalizing a corridor along Elm and Kasota Avenues, to access the string of wetlands tucked along Highway 280 just inside the city boundary of the City of St. Paul.

"Como is not connected to the river and most people don't feel that connection."

- Workshop participant

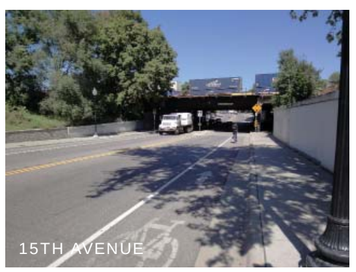
Como Movement Routes

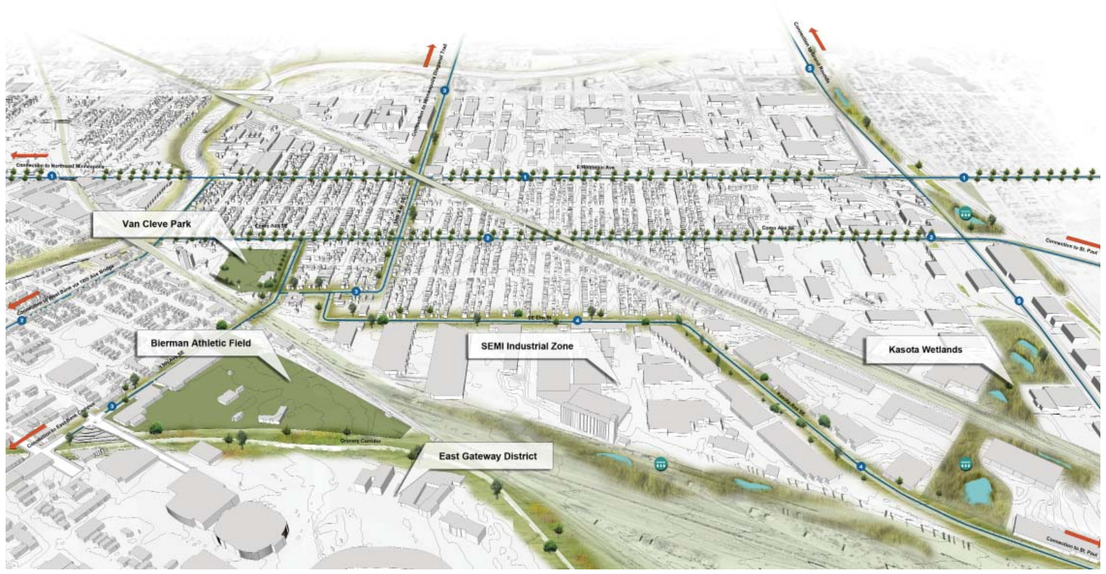


Como Conflicted Areas

Como Comments

		Current problems	Ideas for improvement
A	**Neighborhood (general)**	• "Como is not connected to the river." • "We really would like to get to the river … but access is not good".	• If a connection to the river is to be made, "the corridor needs to be pretty green and significant in itself so that it becomes part of the destination".
B	**Hennepin Avenue**	• Dangerous for walkers and bikers because of heavy traffic.	• Improve Hennepin Ave streetscape and traffic patterns.
C	**Industrial area (Elm St. & Kasota Ave.)**		• **Elm and Kasota could be a greenway for walkers/ bikers**, and a new road could be built along the railroad corridor for industry access. •"Need bicycle connections from Elm St. to the [residential parts] of the neighborhood".
D	**Wetlands along Hwy 280**		• Expand greenspace along the eastern industrial corridor. • "Connect existing wetland remnants. Best path is along 280 connection".
E	**Grand Rounds "Missing Link" study area**		• There are several options for Grand Rounds connections.
F	**Railroad yard**		• "Somewhere along [the rail corridor] build a major green corridor". • "Some sort of walking corridor [across railroad yard] with **pedestrian bridge** to new city park space".
G	**15th Avenue**	• This area is a bottleneck. • This is a "major corridor for movement".	• **Connect 15th Ave. to Granary Corridor.**
H	**Granary Corridor**	• "We like the idea of Granary Parkway wetlands, but SE Como does still not have good access". • Bike connection between the streets and Granary Corridor is difficult" because of grade difference.	• [The corridor should have] "no access by cars - low traffic greenway to St. Paul". • Keep Bridge #9 for bikes and pedestrians only.



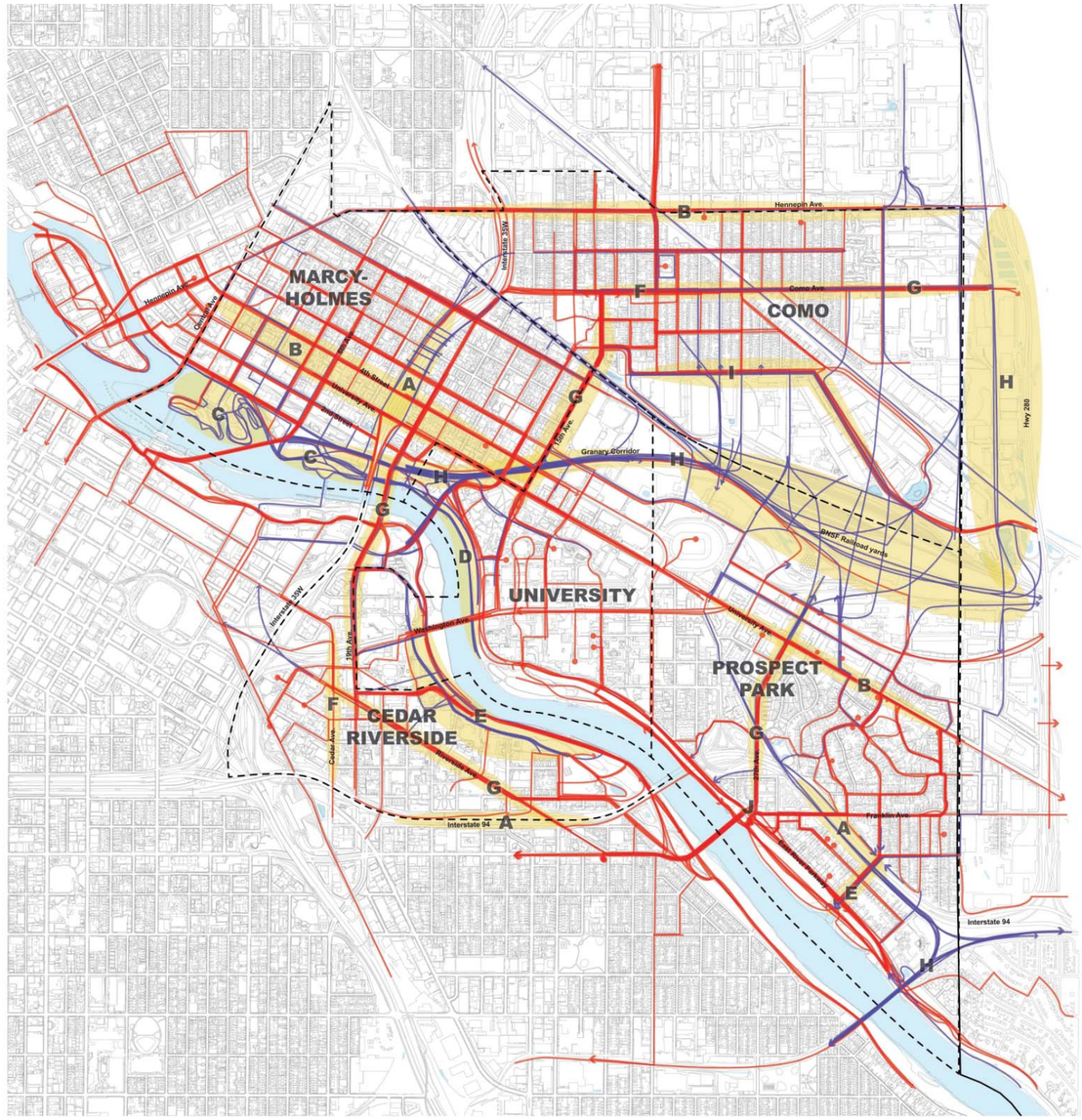


SE Como Greenway Network

1. NE Minneapolis ---------> E Hennepin Ave ---------> St. Paul
2. 10th Ave SE --------> Van Cleve Park --------> Como Ave SE -------- St. Paul
3. 15th Ave SE -------> Van Cleve Park --------> Rollins Ave SE --------> 18th Ave SE --------> Minneapolis Diagonal Trail
4. Van Cleve Park --------> SE Elm St --------> Kasota Ave SE ------>St. Paul
5. Grand Rounds --------> Missing Link Bikeway Connection --------> City Park --------> Mississippi River

Water Infiltraton

Grand Rounds "Missing Link"

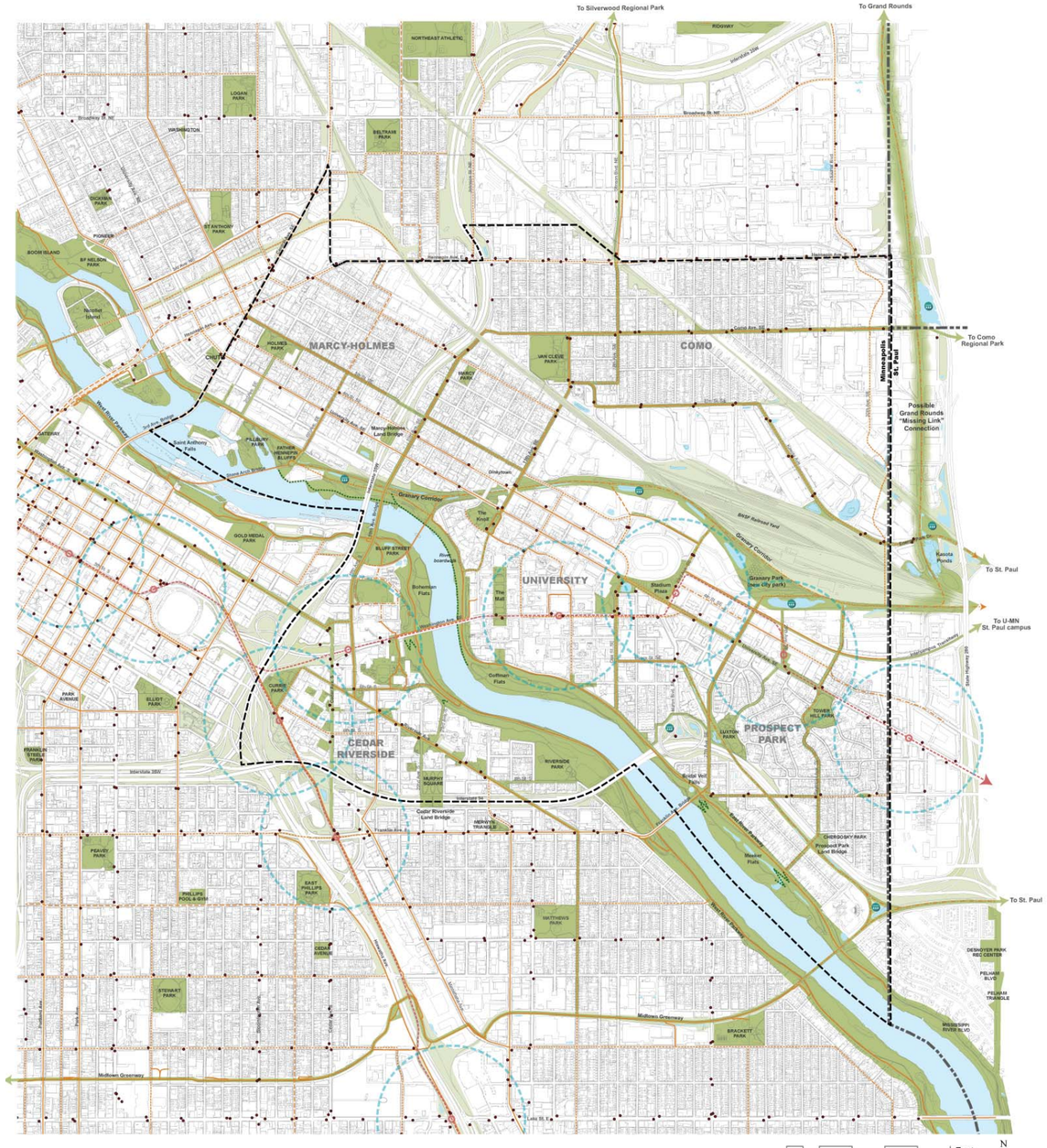


Composite Pedestrian Mobility Options

Critical Territories of Conflict

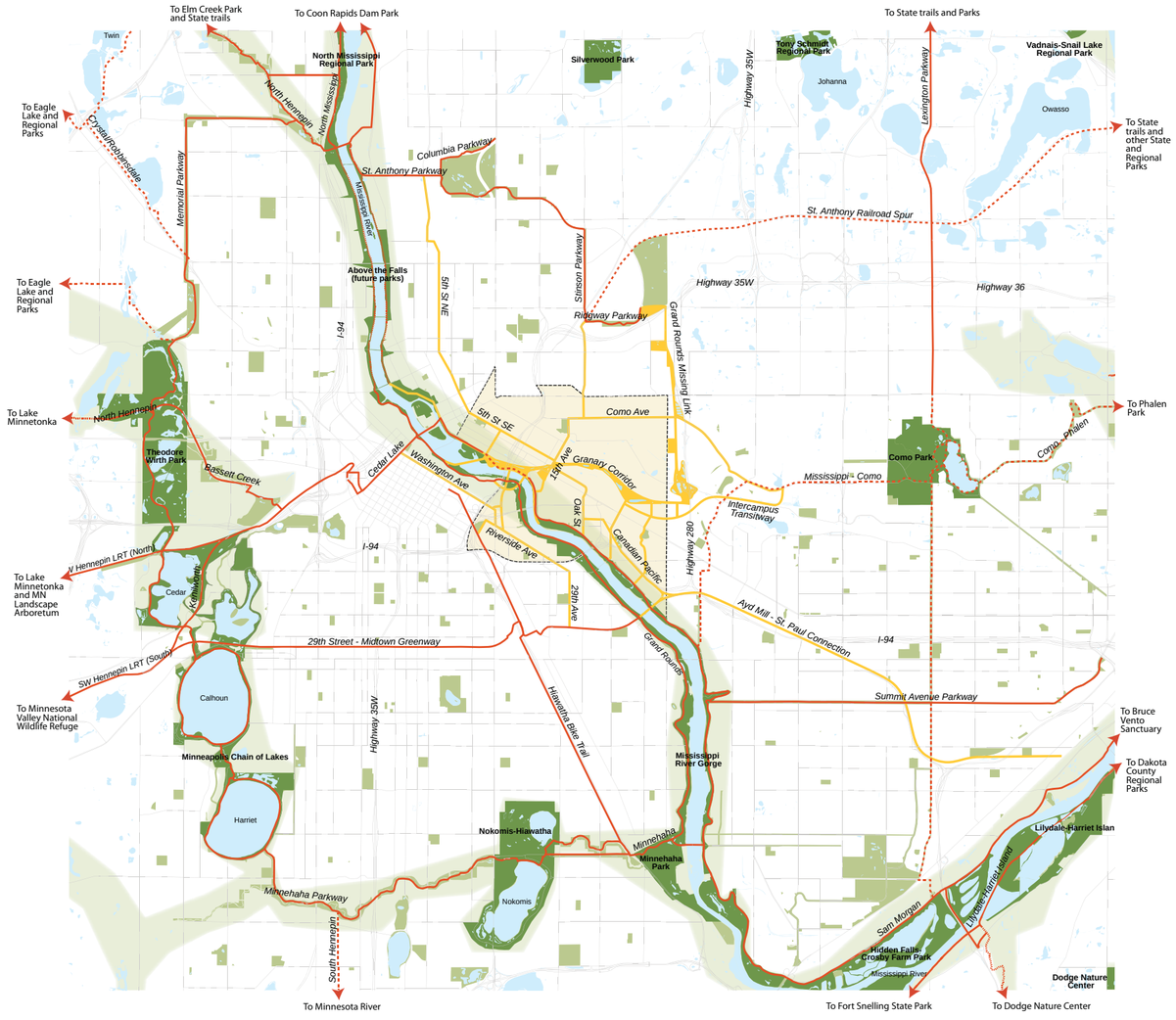
A. Bridging freeways
B. Taming dangerous street crossings
C. Creating new open spaces along the river
D. Connecting the river corridor
E. Improving access to the river flats
F. Enhancing pedestrian destinations
G. Implementing complete streets
H. Completing critical connections
I. Introducing new bike and pedestrian greenways

Proposed Greenway Corridors for the University District



Proposed Open Space and Greenway Corridors

- Existing bike route (City of Mpls)
- Planned bike route (City of Mpls)
- Proposed bike route (City of Mpls)
- Proposed bike route (MDC)
- Light rail transit line and station (in construction)
- 1/4 mile radius from LRT station
- Bus stop
- Stormwater infiltration area
- UDA boundary
- Greenway corridor / public open space
- Right-of-way corridor



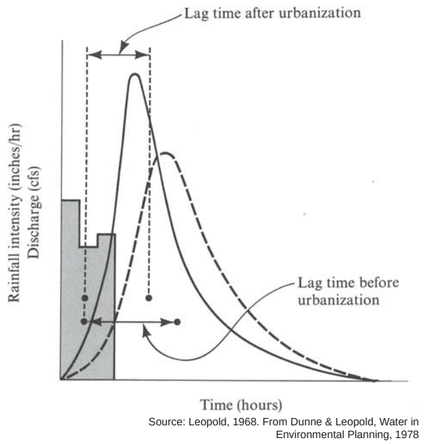
University District's Greenways within the Regional Trail and Open Space Network

- City Park (Minneapolis and St. Paul)
- State or Regional Park
- Metro Conservation Corridor (DNR)
- Existing State or Regional Trail
- Planned State or Regional Trail
- Proposed State or Regional Trail
- University District Greenway

Connecting the University District's Greenways to the Regional Network

The greenways that have been identified and could be devevloped within the University District not only connect District residents to local open spaces, corridors, and neighborhoods, they also connect the District to the larger existing and developing network of regional trails and open space. Utilizing this connected network, a resident of a dense urban neighborhood such as Marcy-Holmes, for example, could easily ride his or her bike from home to one of many quality parks that exist in the region, such as Como Regional Park or the Grand Rounds Parkway. In this way, local greenways serve the larger purpose of opening up opportunities for extended recreational and educational experiences for all 7-county regional residents via a fully-connected open space and trail network.

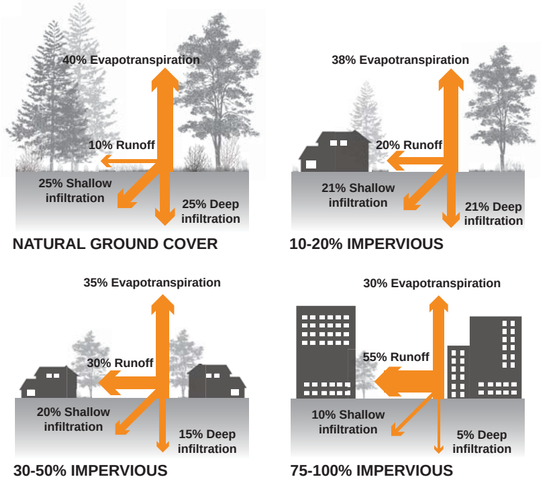
University District: Proposed Greenway Corridors & Open Space



Source: Leopold, 1968. From Dunne & Leopold, Water in Environmental Planning, 1978

Effects of Impervious Surfaces on Stormwater Lag Time and Discharge

As our urbanized areas become increasingly covered with rooftops, parking lots, streets, and highways, the amount of surfaces impervious to rainwater grow to be significant. Stormwater runoff from these impervious surfaces flows into storm drains and ultimately into lakes and rivers carrying heavy metals, chemicals, and other pollutants that damage water quality, put our health at risk, and is inherently costly.



Adapted from: US EPA, Urban Storm Water Management: Best Management Practices, 1999 and adapted from Arnold and Gibbons, 1996.

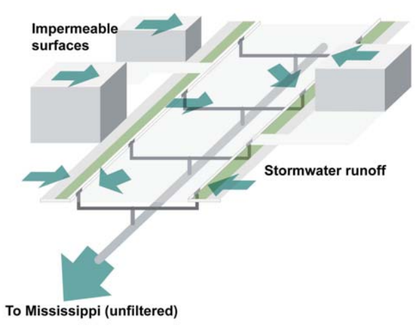
Combining Greenways with Green Infrastructure

The term 'green infrastructure' is applied to a new and expanding science dealing with the management of stormwater. The general principle is to use natural or engineered systems that mimic natural processes to infiltrate or recycle stormwater runoff. In general, green infrastructure is a network of decentralized stormwater management practices that can capture and infiltrate rain where it falls reducing stormwater runoff flowing into lakes and rivers, thus reducing the rate and intensity of flooding and the amount of pollutants reaching our water ecosystems.

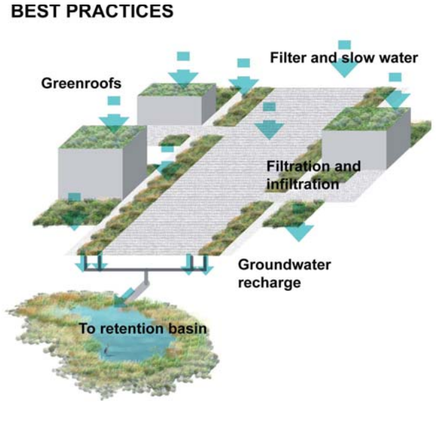
As population density increases from rural to urban, the amount of space occupied by impervious land also increases (Stankowski 1972). In the event of a rainstorm, large amounts of impervious surfaces generate a significant upsurge in the discharge volume and intensity of stormwater runoff (Leopold 1968; Dune and Leopold 1978). The higher the volume of water discharged, the higher is the propensity for severe flooding, greater soil erosion and deposition, and the transport of surface pollutants that damage water quality.

Work conducted by the Federal Emergency Management Agency estimates that 25% of the $1 billion of annual damage caused by flooding is linked to stormwater management (ASLA at al 2012), a figure that is expected to be on the rise due to our changing global climate and its effects on seasonal precipitation and storm frequencies. In looking at our near future, most solutions will not favor increasing our federal budgets to mitigate stormwater management but will be looking for infrastructure management practices that can reduce runoff and be harvested before entering our community sewage systems.

CONVENTIONAL APPROACH



BEST PRACTICES



Benefits of Green Infrastructure

The history of urban drainage and stormwater management has been with us since antiquity. Conventional practice has been that of removing stormwater away from the site as quickly as possible, discharging runoff into streams and causing major detrimental effects on the dynamics of streams as well as water quality. Today, approaches to green infrastructure involve the capturing of significant amount of runoff at the source via water harvesting, infiltration, and evapotranspiration, while adding potential benefits of reusing harvested water in buildings, using it as community rain gardens, and wetland restoration.

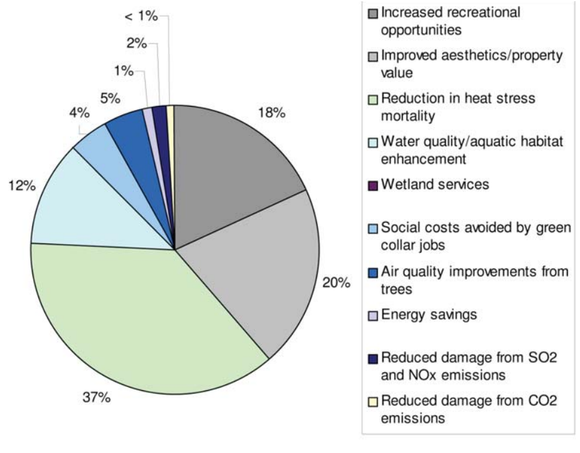
Green infrastructure expands the amount of trees and ground vegetation, which improves air quality, increases habitat and green space, enhances human health, and provides aesthetic qualities, which can improve property values and quality of life. Because of the variety of options available, green infrastructure can be more easily adapted than grey infrastructure making it flexible enough for any site, no matter how urban or impervious. While each practice varies in cost, selecting the appropriate combination of alternatives should be the criteria to achieve specific goals.

Studies have also shown that permeable pavement used as part of the green infrastructure system can benefit cold climate communities. Meltwater on the surface of the roads immediately infiltrates the permeable pavement eliminating the potential for refreezing thus reducing the slip/fall hazard associated with impervious surfaces (CNT & AR, 2010). As such, less plowing and less salting is required, reducing the cost to municipalities while reducing the source of pollutants to downstream waterways.

At present, the ability of these green infrastructure practices to deliver multiple ecological, economic, and social benefits has made green infrastructure an increasingly popular strategy. In addition to reducing polluted stormwater runoff, green infrastructure practices can also positively impact energy consumption, air quality, improve carbon sequestration, influence property prices, and other elements of community health and vitality that have monetary or other social value.

Today, a new paradigm is developing where communities are beginning to use stormwater as a resource, recognizing the value in utilizing rainfall onsite to enhance green spaces, reduce urban temperatures, and replenish groundwater supplies.

American Rivers, the Water Environment Association, the American Society of Landscape Architects, and ECONorthwest, 2012



Shares of City-wide present value benefits of key CSO options: Cumulative through 2049

The City of Philadelphia Water Department, conducted a Triple Bottom Line (TBL) assessment of comparing the costs traditional vs. green infrastructure, concluding that the benefits of using green infrastructure far outweighs traditional methods in the following categories:

- Recreation
- Community aesthetics reflecting higher property values
- Heat stress reduction
- Water quality and aquatic ecosystem improvements
- Wetland creation and enhancement
- Poverty reduction from an increase of local green jobs
- Energy savings and carbon footprint reduction
- Air quality improvements
- Savings related to construction and maintenance-related disruptions

Green Infrastructure vs. Grey Infrastructure

A look at how green infrastructure can save costs to municipalities was indicated in a published report by a consortium of agencies including the American Society of Landscape Architects. The survey by the ASLA included 479 case studies from 43 states demonstrating that green infrastructure and low-impact development approaches can offer significant benefits to local governments. The ASLA report suggests: Municipalities may be able to obtain substantial savings by incorporating green infrastructure practices into the construction or retrofit of public buildings and infrastructure. Because green infrastructure reduces the amount of water entering conventional stormwater systems, the size and scope of conventional infrastructure can be minimized, thus saving on initial costs. Aging streets can be retrofitted to incorporate green infrastructure with existing grey infrastructure. Data from these types of projects indicate that street designs including green infrastructure would cost $329 less per square foot than a conventional street (ASLA, et al., 2012).

Green Infrastructure Practices Offer Cost-Effective Solutions
American Society of Landscape Architect's Green Infrastructure Survey

Project Type:

Institutional/Education	21.5%
Open Space/Park	21.3%
Other	17.6%
Transportation Corridor/Streetscape	11.9%
Commercial	8.6%
Single Family Residential	3.7%
Government Complex	4.2%
Multifamily Residential	3.7%
Open Space Garden/Arboretum	2.9%
Mixed Use	1.8%
Industrial	1.1%

Green Infrastructure Type:

Retrofit of existing property	50.7%
New development	30.7%
Redevelopment project	18.5%

Did use of green infrastructure increase costs?

Reduced costs	44.1%
Did not influence costs	31.4%
Increased costs	24.5%

Source: American Rivers, the Water Environment Federation, the American Society of Landscape Architects (ASLA), and ECONorthwest (2012). Banking on Green: A Look at How Green Infrastructure Can Save Municipalities Money and Provide Economic Benefits Community-wide.

Many assessments of green infrastructure costs and benefits find that total benefits outweigh the total costs, particularly relative to grey infrastructure strategies and at comparable scales.

American Rivers, the Water Environment Association the American Society of Landscape Architects, and ECONorthwest, 2012

PRACTICE

	Reduces Water Treatment Needs	Improves Water Quality	Reduces Grey Infrastructure Needs	Reduces Flooding	Increases Available Water Supply	Increases Groundwater Recharge	Reduces Salt Use	Reduces Energy Use	Improves Air Quality	Reduces Atmospheric CO^2	Reduces Urban Heat Island	Improves Aesthetics	Increases Recreational Opportunity	Reduces Noise Pollution	Improves Community Cohesion	Urban Agriculture	Improves Habitat	Cultivates Public Education Opportunities
	Reduces Stormwater Runoff				BENEFIT							**Improves Community Livability**						
Green roofs	●	●	●	●	◒	○	○	●	●	●	●	●	◒	●	◒	◒	●	●
Tree Planting	●	●	●	●	○	◒	○	●	●	●	●	●	●	●	●	◒	●	●
Bioretention & Infiltration	●	●	●	●	◒	◒	○	○	●	●	●	●	●	◒	◒	○	●	●
Permeable Pavement	●	●	●	●	○	◒	●	◒	●	●	●	◒	○	●	◒	○	○	●
Water Harvesting	●	●	●	●	●	◒	○	◒	◒	◒	○	◒	◒	○	◒	◒	◒	●

● Yes ◒ Maybe ○ No

Adapted from: Center for Neighborhood Technology & American Rivers (2010). The Value of Green Infrastructure: A Guide to Recognizing Its Economic, Environmental, and Social Benefits.

SOURCES
Green Infrastructure

- American Rivers, the Water Environment Federation, the American Society of Landscape Architects (ASLA), and ECONorthwest (2012). Banking on Green: A Look at How Green Infrastructure Can Save Municipalities Money and Provide Economic Benefits Community-wide.
- Center for Neighborhood Technology & American Rivers (2010). The Value of Green Infrastructure: A Guide to Recognizing Its Economic, Environmental, and Social Benefits.
- Dunne, Thomas & Leopold, Luna (1978). Water in Environmental Planning. W.H. Freeman.

Expanding Green Infrastructure: Implementing "Streets for Living"

Source: Flickr. Woonerf images

"We should raise our sights for the moment. What could a residential street - a street on which our children are brought up, adults live, old people spend their last days - what could such a street be like?"

Donald Appleyard, *Livable Streets 1981*

The Voice of Experience

Living Streets are designed to be shared safely by pedestrians, bicycles, and low speed motor vehicles. They lack curb separation between sidewalk and the street right-of-way, reclaiming street space for pedestrians, bicyclists, children, and commercial activities. Living Streets design increases ecological performance by increasing the proportion of permeable surfaces and providing infiltration spaces to reduce stormwater runoff, enhancing ecological performance while serving as a civic asset to the community.

Benefits of Living Streets

- Improve traffic safety by slowing traffic
- Encourage more walking and cycling
- Increase water harvesting
- Maximize water infiltration and eliminate runoff
- Improve habitat formation and biodiversity
- Increase opportunities for social interaction
- Reduce crime
- Improve value of properties
- Enhance mobility of vulnerable groups

Balanced Use

[The San Francisco] Better Street Plan is designed and built to strike a balance between all users regardless of physical abilities or mode of travel. The Plan attends to the needs of people first, considering pedestrians, bicyclists, transit, street landscapes, stormwater management, utilities, and livability as well as vehicular circulation and parking. The Plan highlights include:

- Distinctive, unified streetscape design
- Space for public life
- Enhanced pedestrian safety
- Improved street ecology
- Universal design and accessibility
- Integrating pedestrian with transit
- Creative use of parking lanes
- Traffic calming and enhanced pedestrian safety

SF Planning Department, Guide to the San Francisco Better Street Plan 2010

Toward a Holistic Approach

In order to balance different streets functions and modes within the space available, living streets require a more holistic and multidisciplinary design approach than that of conventional street design. Collaboration with the community and different professionals is essential to successful design and implementation of living streets.

Nelson/Nygard, *Streets for Living: Planning Tools and Best Practices, 2006*

Streets for People

The beauty of "livable streets" and of the movement bearing its name is that it unites under one rubric what had long been largely separate concerns — better bicycling, safer walking, affordable transit, inviting public spaces, urban sustainability. The term also recasts a negative as a positive, turning what could appear invasive — "getting people out of their cars" — into something situational: creating streets for people.

Charles Komanoff *Why is Manhattan Institute Afraid of Livable streets?, 2030*

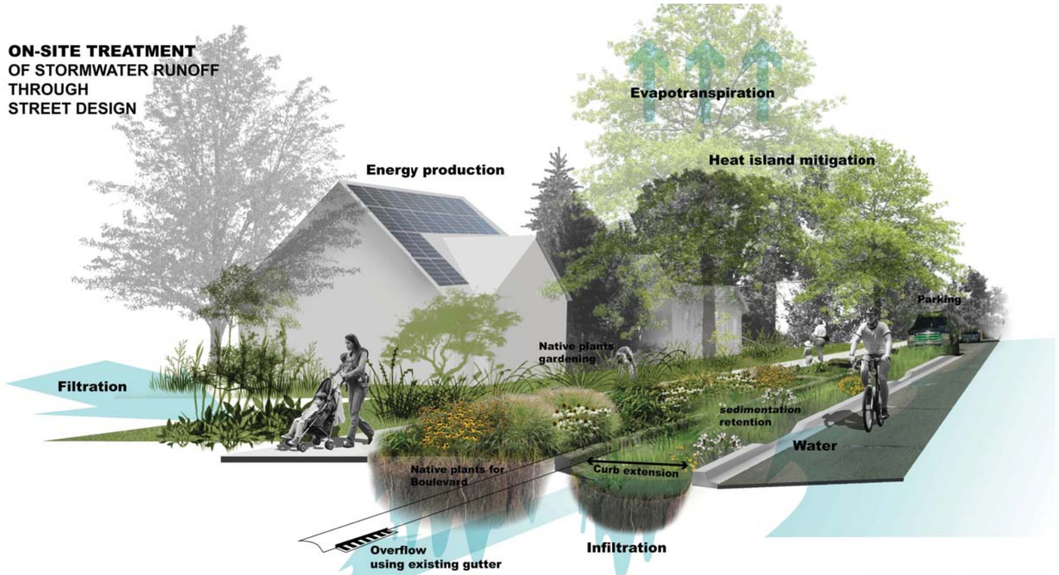
Proven Safety

The current iteration of Grand Street, by most any objective measure, has to be considered a success. In the year since it was reconfigured to host the city's first parking-protected bike lane, with the blessing of Community Board 2, injuries are down 30 percent, with about 1,000 cyclists using the lane daily.

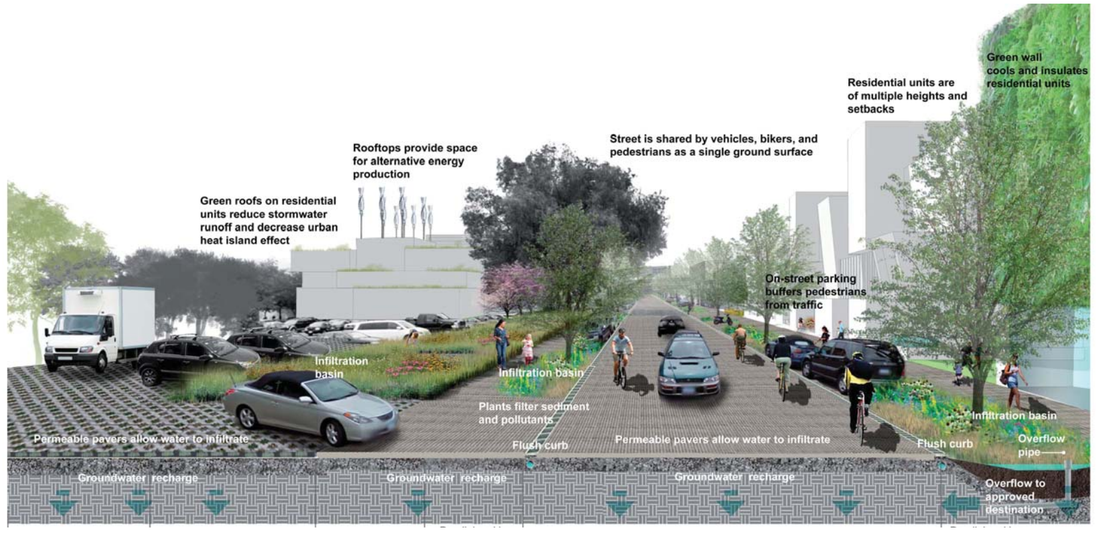
Other recent street safety projects are paying off with similar dividends, according to DOT data. After the Ninth Avenue protected bike lane was installed in 2007, injuries among all users dropped 56 percent and the protected Broadway bike lane between 42nd and 35th Streets brought a 50 percent drop in injuries.

Innovations and big cultural transformations take place in cities…. For all the difficulties that living in a city entails, cities have throughout history, been the places that have ignited the "sacred flame" of human imagination and creativity.

Sir Peter Hall
Cities in Civilization



Stormwater Runoff Diagram of a Residential "Living Street"

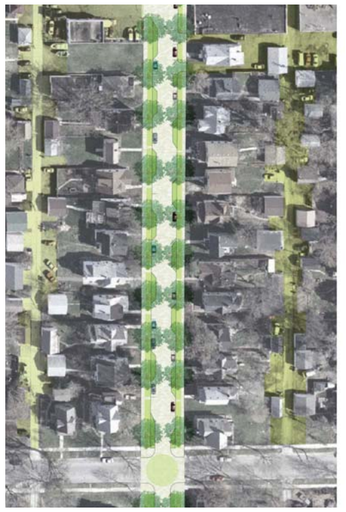


Hypothetical Commercial "Living Street" Design

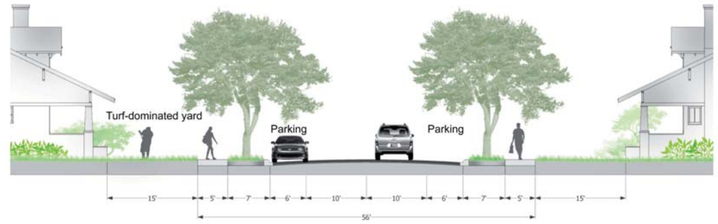
A Hypothetical Strategy for Como Neighborhood

There are many ways of improving the living conditions of a community. Street re-design is one of the most useful approaches to recover the quality of the street as a public space allowing for safe pedestrian mobility and vehicular access. Today, the concept of living streets incorporates multiple design strategies to make neighborhood streets more compatible with human livability. It is also important to incorporate sustainable strategies to reduce impervious surfaces and recover stormwater run-off into a system of rechargeable basins, allowing for a diversity of infiltration and water retention possibilities prior to reaching lakes and river systems. This series of images demonstrates how taking a portion of Como neighborhood as a hypothetical case can transform by using a set of Living Streets principles.

"Street re-design is one of the most useful approaches to recover the quality of the street as a public space allowing for safe pedestrian mobility and vehicular access."

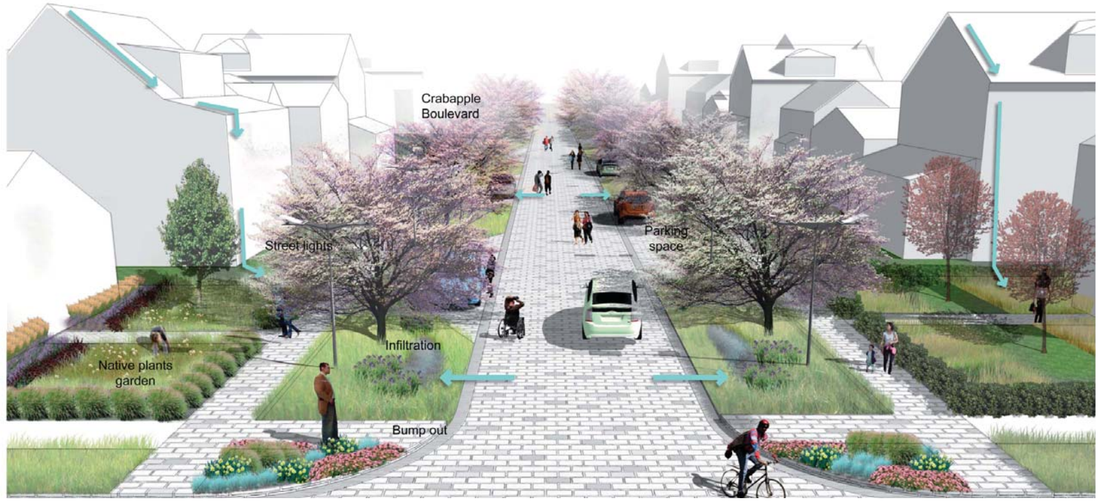


Typical Como Block with "Living Street" Re-design



Typical Street Section

Proposed Street Section



An Example of a "Living Street" Design for Como Neighborhood

The Mississippi River is not only the grand natural feature which gives character to your city and constitutes the main spring of prosperity, but it is the object of vital interest and center of attraction to intelligent visitors from every quarter of the globe, who associate such ideas of grandeur with its name as no human creation can excite. It is due therefore, to the sentiments of the civilized world, and equally in recognition of your own sense of the blessings it confers upon you, that it should be placed in a setting worthy of so priceless a jewel.

H. W. S. Cleveland
In a presentation to the Minneapolis Park Board

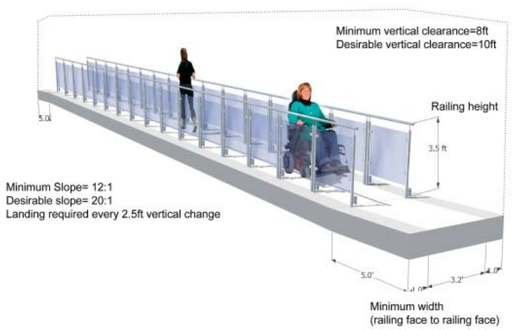
Providing Access to the Mississippi River: Meeker Flats Case Study

While Meeker Flats is currently enjoyed by neighborhood residents walking their dogs or exploring the river's edge, it is plagued by inaccessibility and understandable concerns about safety. By improving access and safety through new access walkways that encourage people to find their way down to the river edge, Meeker Flats can become a top-quality destination and refuge for recreationalists and naturalists alike - a gem within the District's open space and greenways network.

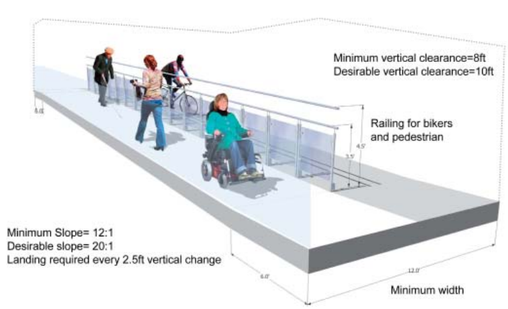
Two winding walkways - one at Franklin Bridge and one where Seymour Avenue meets the East River Parkway - will descend gradually through the gradient of ecosystems to the shoreline. By selectively opening up areas in the tree canopy at the top of the bluff around the new entry points, the river edge will be easier to find and fantastic views across the river will emerge. Viewing platforms along the walkways encourage stopping to rest and observe the surrounding wildlife. The addition of lighting along the stairway makes the river accessible during the evening, allowing visitors to experience the nighttime landscape of the river gorge.

Once down on the flood plain, visitors can explore the length of the Flats on walking and biking trails or wandering along the river shoreline. The width of the Flats provides a variety of spaces, each with its own experiential quality and opportunities for activities. The sub-canopy of the oak forest and floodplain offers berry-producing shrubs, a perfect spot for catching a glimpse of a colorful song bird. The sheltered base of the bluff is a damp quiet place, where delicate plants assemble around trickles of water seeping from the rock outcroppings above. A picnic spot under an oak tree surrounded by prairie grasses provides an open view to the river. The marsh along portions of the river edge is a busy place where wading birds catch fish and insects. On the river edge, visitors can catch a variety of fish, launch a canoe, or wade along sandy shore, enjoying the afternoon sun warming the Mississippi River gorge.

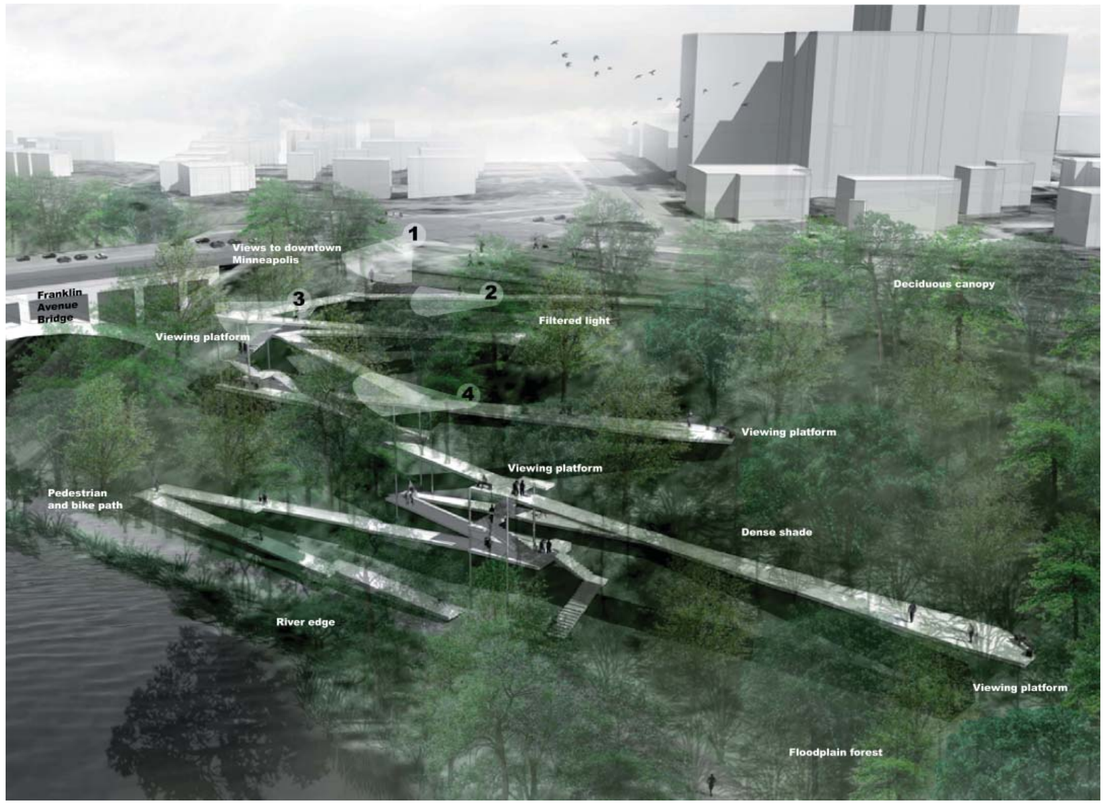
Potential User Groups



ADA Minimum Standards for Pedestrian Path



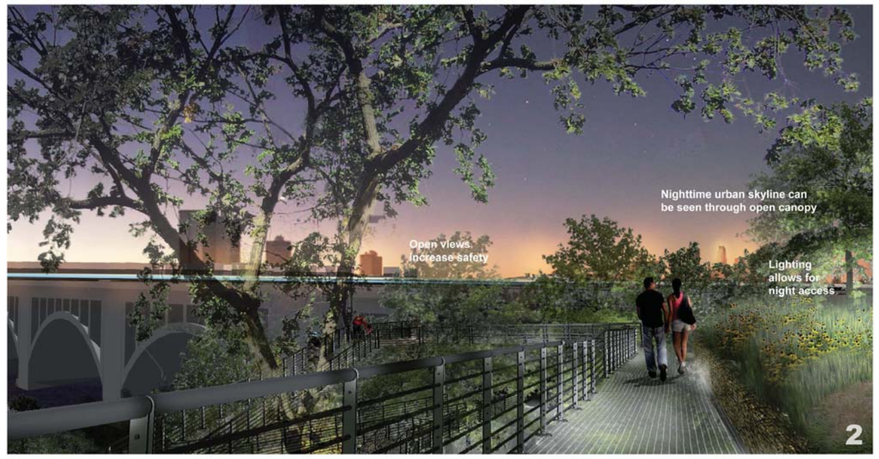
Requirements for Pedestrian and Bike Path



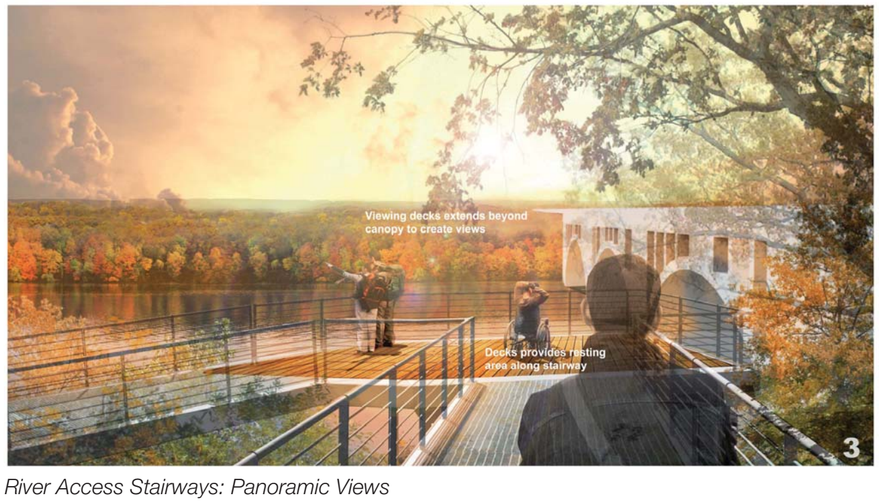
Meeker Flats Staircase 1

Meeker Flats Canopy Walk

Bluff Entrance



Evening Walk



River Access Stairways: Panoramic Views

Meeker Flats Access Plan

Section: East River Road to River's Edge

Fluvial Ecosystem of Meeker Flats

Central Mississippi Riverfront: Recreational Development Opportunities

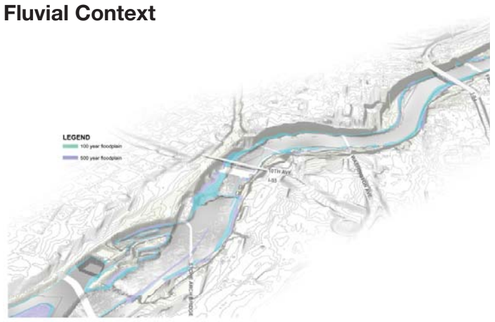
Section 1: St. Anthony Falls
This short stretch from the Third Ave Bridge to the Stone Arch Bridge is the most urban, and perhaps the most engineered, section of the University District riverfront, but it also has the richest cultural and natural history. Many residents and visitors gather at St. Anthony Main, a vibrant streetscape, for walking and dining while overlooking the Saint Anthony Falls. Historians call this section the birthplace of the City of Minneapolis with its historic A-Mill presence. This site however, had a spiritual significance for its previous inhabitants - the Dakota people.

Section 2: The Lower Dam
Once featuring numerous beautiful streams and waterfalls, the river and riverfront between the Stone Arch Bridge and Northern Pacific Bridge #9 have since been highly engineered to serve power-generating and transportation purposes. The Minnesota Department of Natural Resources has indicated that this section of river furnishes phenomenal habitat for a wide variety of fish. Opening up access in this section of the river would provide multiple benefits to fisherman, but also to recreationalists wanting to engage in water rafting, kayaking, walking, or biking along the river.

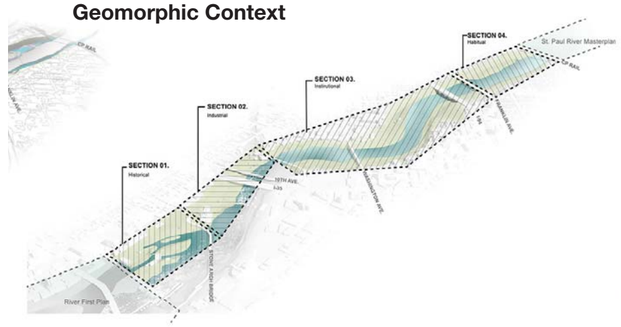
Section 3: Meandering Bluffs and Flats
From Bridge #9 to Interstate 94 Bridge the river enters the narrow Mississippi River Gorge, among bluffs almost 100 feet tall. Because of its meandering nature, this section of the river is characterized by the fluvial process of erosion and deposition, in which sediment scoured from one side of the riverbank is deposited on the opposite side. The results of this process are the sandy beach along the Bohemian Flats. Due to their accessibility from the river, these wide flats were used for a great variety of human purposes, including boat landing in early navigation, immigrant settlement, industry, and barge terminal storage.

Section 4: The River Gorge
Once the river passes below the Interstate 94 Bridge, it forms the proper Mississippi River Gorge. Here the steep slopes and bluffs remain but the sandy banks along Meeker Flats are of human construction. Today, Meeker Flats provides a critical habitat to birds and animals and the experience of being on a wooded riparian corridor, a welcome respite in the center of a large metropolis. Bridal Veil Falls, the only remaining gorge waterfall in the University District, is tucked along the riverside trail just upstream of the Franklin Bridge.

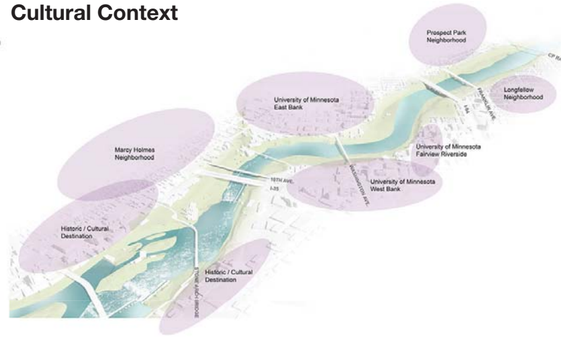
Fluvial Context

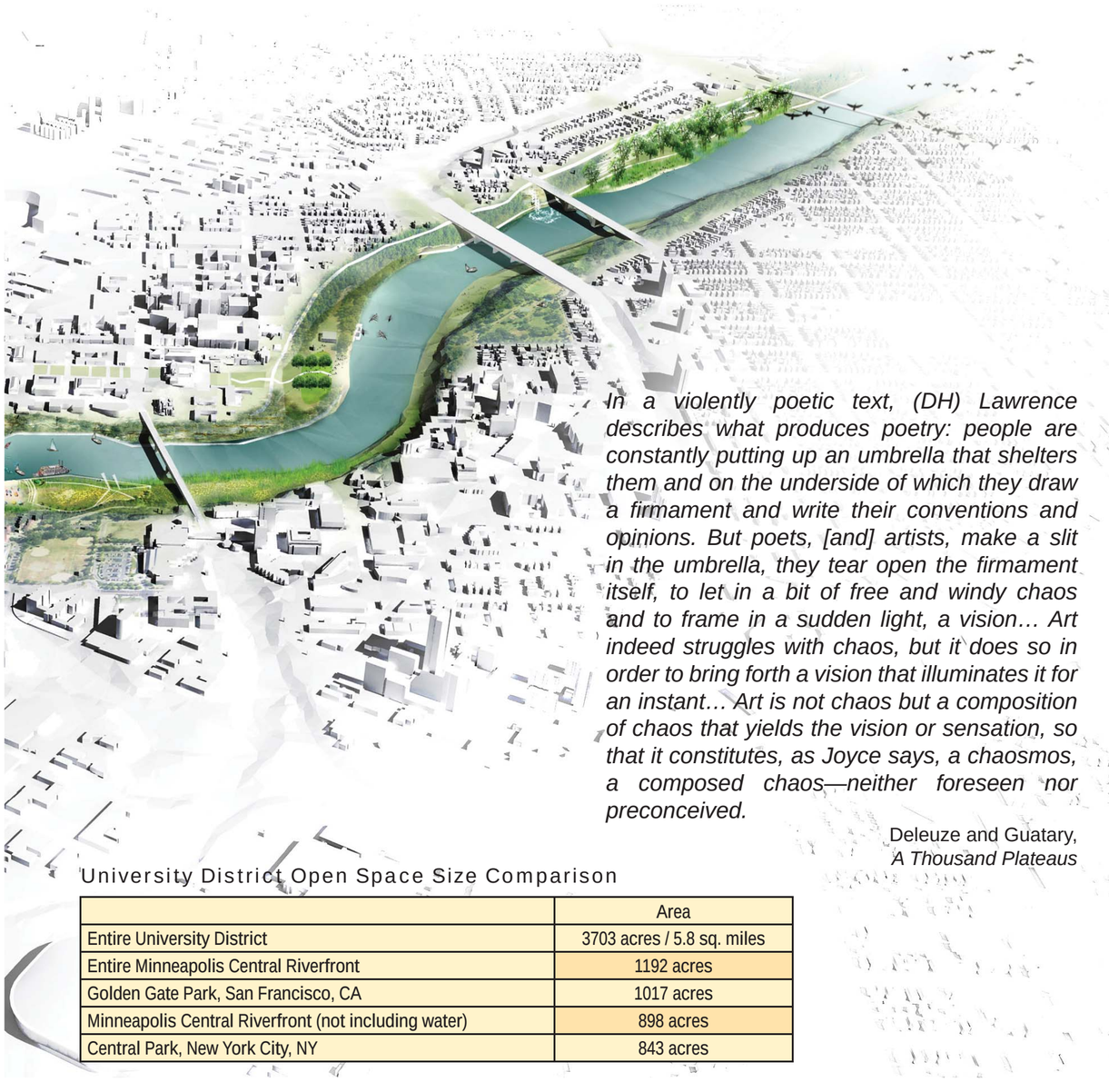


Geomorphic Context



Cultural Context





In a violently poetic text, (DH) Lawrence describes what produces poetry: people are constantly putting up an umbrella that shelters them and on the underside of which they draw a firmament and write their conventions and opinions. But poets, [and] artists, make a slit in the umbrella, they tear open the firmament itself, to let in a bit of free and windy chaos and to frame in a sudden light, a vision… Art indeed struggles with chaos, but it does so in order to bring forth a vision that illuminates it for an instant… Art is not chaos but a composition of chaos that yields the vision or sensation, so that it constitutes, as Joyce says, a chaosmos, a composed chaos—neither foreseen nor preconceived.

Deleuze and Guatary,
A Thousand Plateaus

University District Open Space Size Comparison

	Area
Entire University District	3703 acres / 5.8 sq. miles
Entire Minneapolis Central Riverfront	1192 acres
Golden Gate Park, San Francisco, CA	1017 acres
Minneapolis Central Riverfront (not including water)	898 acres
Central Park, New York City, NY	843 acres

Riverfront at SE Main Street, Across from Pracna and Aster Properties

Waterfront Wetlands and Recreation at Granary Flats

Beachfront Recreation at Bohemian Flats

Meeker Flats Floodplain Forest and Fluvial Ecosystem

Bridal Veil Falls

Coffman Flats in Winter

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