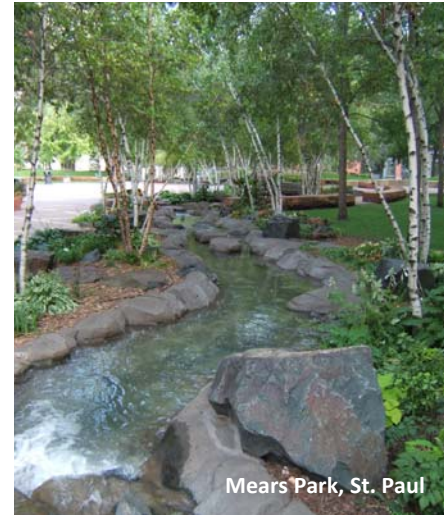


Stream Corridor Restoration Plan

Stream Corridor Restoration Approach

The Bringing Water Back to St. Paul campaign is a major effort to restore surface water features, in this case streams, within the Watershed. There are many important advantages this offers starting with improving water quality - the ability to access and treat runoff at the surface with vegetative filtering and volume control and/or infiltration. Of similar importance for improving water quality is the longer term approach of raising awareness. Bringing Water Back to St. Paul will serve a key function to reconnect residents with their water resources. By being connected to the resource, this will lead to better stewardship of runoff and our waters. There are a number of locations around the city where, given the right circumstances with regard to development plans, funding, public support, and other factors, it would be feasible to recreate a stream feature in the same area as the historical stream.



The design goals of stream corridor restoration can be summarized in the following points:

- Water quality treatment of local drainage in surface features (e.g. raingardens and biofiltration) in conjunction with treatment provided by the stream itself (e.g. filtration and infiltration);
- Improved citizen awareness and understanding of their impacts on water quality and thus better citizen stewardship;
- Enhanced communities and improved property values as a result of water-related amenities;
- Ecologic benefits of additional green space in urban areas;
- Systematically slowed runoff to reduce flooding and flow velocity.

The goal to reconnect urban residents with their waterbodies cannot be stressed enough. Stream restoration projects will increase the visual and physical access of District residents and visitors to surface water resources which can have the effect of increasing awareness. Increasing awareness of water resources in urban settings can instill a sense of value and improve public stewardship. Stream restoration projects are intended to have public access, trails and interpretive elements to aid in this goal.

While there are numerous potential benefits from projects under the Bringing Water Back to St. Paul campaign, there are also a number of significant issues upon which implementation depends including, but not limited to physical constructability, partner and stakeholder cooperation, maintenance requirements and responsible parties, and timing and nature of redevelopment. Detailed feasibility studies will evaluate these issues and will identify whether restoration projects can be integrated into the drainage system, the neighborhood, and the planning schedule of other affected entities. Results from the feasibility studies will guide the selection of projects for implementation. The following is a compilation of the issues each stream feasibility study will address:

- Redevelopment Opportunity – present/absent, timing of design and construction, owner interest;
- Stream Design – physical constructability, flood and flow control, streambank and channel stability, sediment transport, costs;
- Water Quality Treatment – implementation opportunities, magnitude of treatment benefits, costs;
- Maintenance of Function and Aesthetics – tasks and frequency, lifecycle costs, responsible parties;
- Educational Benefits – public use, access, interest and visibility;
- Partnerships – entities (redevelopment authorities, property owners, local government, neighborhood/community groups), level of interest and support, resource contributions;
- Funding – grants, cost-shares, partnerships;
- Permitting Requirements;
- Community safety;
- Site specific issues – including but not limited to brownfield sites, historic places, trash.

Citizen participation will play a key role in scoping out and guiding the Feasibility Studies. To have success in bringing water back, figuratively and literally, it must be a collaborative effort. Citizens are also expected to have a role in selecting and prioritizing sites for restoration and hopefully will assist in the implementation. Areas with active, interested citizen groups will be weighted in the site-selection process.

As a way of initiating the site selection process, a preliminary list of potential restoration sites has been developed. Twelve sites were selected based on historical water features, site topography and infrastructure, land use and ownership, hydrologic impacts, and plans for redevelopment or restoration. The preliminary list, in random order, is as follows (see **Figure 1** for a map of the stream corridors):

- | | |
|----------------------|--------------------------------|
| • Trout Brook | • Mears Creek |
| • Hidden Falls Creek | • Highland Creek |
| • Phalen Creek | • Rice's Brook |
| • Sarita Stream | • Gateway Creek |
| • Finn's Stream | • Cascade Creek/Fountain Creek |
| • Edgecumbe Stream | • Loeb Creek |

The stream corridors identified at this stage of the process could be restored using a variety of different techniques. Storm sewer daylighting is one option that involves excavating earth around existing storm sewer and creating a healthy, stable stream bed in place of the storm sewer. This scenario requires existing storm sewer that is shallow and existing flowrates that are manageable. Alternatively, stream corridor restoration could occur through localized collection of rain and snowmelt runoff in newly established stream channels, prior to discharge to storm sewer conveyance systems. The latter scenario could consist of a dual system where flows above design flowrates can drop back into stormsewer to provide control of surface flows. The primary visible

characteristics of a stream corridor restoration of this type could be described as natural area corridors with some landscaped features along which water will flow during rainfall and for a brief period afterwards. Water will not constantly flow through restored stream corridors except in the rare case where an opportunity for constant inflow materializes (described later in **Table 1**). Ultimately the site will dictate the stream's flow regime and physical characteristics.

Mears Creek stands apart from the other corridors due to its entirely urban location. The concept for this creek is to bring surface water to the forefront of people's conscience with a focus on art above function while still restoring some natural flow patterns locally. The effect is to reference the presence and value of surface waters in areas where restoring a functional surface feature is more difficult. The images below, from www.artfulrainwaterdesign.net, illustrate how the stream corridor restoration could work for a site that could ultimately wind through any feasible portion of downtown St. Paul (e.g. along a wide sidewalk). Connectivity, either physical or visual, to the existing stream feature running within Mears Park, established the interest in the proposed location.



Stream Opportunities

The twelve potential stream corridors have been categorized into one of three ratings according to the opportunities that may facilitate implementation. Physical constructability (not accounting for “political/neighborhood” considerations) and the potential corridor’s link to District Goals & Initiatives, e.g. accessibility, visibility, proximity to focus redevelopment sites, connectivity to existing water features of interest and hydrologic function also inform the rating done here. It should be understood that the rating is based on fairly limited data and a general, “high altitude” look at the various factors effecting their feasibility for implementation. It is understood that as new information becomes available, residents and communities are engaged, and funding sources become available, the priorities could shift. **Table 1** illustrates the established priority ranking developed at this broad, planning-level.

Based on findings in **Table 1**, it is recommended that at least 4-6 of the top rated corridors, which would include all Level 1 and some Level 2 stream corridors, be selected for completion of a feasibility study during years 1-6 of the plan.

Due to the many variables affecting feasibility, corridor selection for feasibility studies needs to be flexible. Those corridors that are selected for technical feasibility studies will be based on the findings noted in **Table 1**, which could change as new information comes to light. Time sensitive factors that will guide the selection process include, but are not limited to, community support, funding opportunities and timing of redevelopment projects. Citizen participation will play a key role in selecting sites for restoration. Areas with active, interested citizen groups will be weighted in the site-selection process. Based on findings of the feasibility studies, we expect that one to three of these stream corridors will be implemented during years 4-10 of the plan. It is desired that citizen involvement at the planning stage will be coupled with participation at the construction stage. Opportunities for involvement will be explored (e.g. streambank plantings ‘adopted’ by residents, associated green infrastructure such as rain gardens).



Hidden Falls



Sarita Forebay

Table 1 Stream Corridor Restoration – Potential Sites

Hidden Falls Creek	Opportunity Rating	High
	Location	Through Ford Plant/redevelopment site to Mississippi River
	Opportunity	Ford Plant Redevelopment Site
	Constructability*	High
	District Goals**	High
	Additional Highlights: Why Is This Site A Good Candidate?	Good visibility; identified for restoration by Saint Paul on the Mississippi Design Center (City of Saint Paul and the Riverfront Corporation); full site redevelopment gives design flexibility; potential to include entire historic creek; demonstration site potential for future stream corridor restorations.
Mears Creek	Opportunity Rating	High
	Location	Stream under foot: Mears Park or Rice Park to Mississippi River in downtown St. Paul
	Opportunity	Central Corridor Light Rail Development
	Constructability*	Low
	District Goals**	High
	Additional Highlights: Why Is This Site A Good Candidate?	"Stream under foot;" represented with artistic elements (grates, stamped concrete, sculptures - see photos); popularity of and Connectivity to Mears Park "Stream"; high visibility and social/educational impact; establishes the campaign's presence in the downtown area.
Trout Brook	Opportunity Rating	High
	Location	Restoration of upper Trout Brook and 'daylighting' lower Trout Brook to Mississippi River
	Opportunity	Trillium Site Trout Brook Greenway Plan (City of St. Paul); CRWD owns Trout Brook Interceptor; Redevelopment SE of LaFayette Bridge and I-94
	Constructability*	High
	District Goals**	High
	Additional Highlights: Why Is This Site A Good Candidate?	Constant inflow (water treatment plant); proximity to Bruce Vento Nature Sanctuary; partnership and public support/financing likely; Trout Brook is the largest historical stream in CRWD; phased implementation likely; restoration of existing surface reach.
Phalen Creek	Opportunity Rating	High
	Location	Along Phalen Blvd to Swede Hollow Park
	Opportunity	3M Redevelopment Site
	Constructability*	High
	District Goals**	High
	Additional Highlights: Why Is This Site A Good Candidate?	Site is along an existing bicycle trail and connected to stream daylighted in Swede Hollow Park; restoration of existing daylighted reach; good visibility; steady flow possible due to collection of spring water; close approximation of historical Phalen Creek.
Sarita Stream	Opportunity Rating	High
	Location	Through Fairgrounds to Sarita Wetland - back into stormsewer
	Opportunity	Local flooding and water quality corrections needed
	Constructability*	High
	District Goals**	High
	Additional Highlights: Why Is This Site A Good Candidate?	Amenity for State Fair; high visibility and collaboration; connects to Sarita Wetland; open areas (UM farms, Fair parking) provides flexibility in restoration footprint.

Cascade Creek/ Fountain Creek	Opportunity Rating	Medium
	Location	Along Ayd Mill Road to Mississippi River
	Opportunity	
	Constructability*	Medium
	District Goals**	Medium
	Additional Highlights: Why Is This Site A Good Candidate?	Existing plan for Ayd Mill bike path (?); access to Fountain Cave; steady flow possible due to collection of spring water; close approximation of historical Cascade Creek and Fountain Creek.
Finn's Stream	Opportunity Rating	Medium
	Location	Summit Avenue to Shadow Falls/Finn's Glenn
	Opportunity	
	Constructability*	High
	District Goals**	Medium
	Additional Highlights: Why Is This Site A Good Candidate?	Wide parkway (easier construction) flows toward River; high visibility from running trail and local traffic (showcase); approximation of historical stream feeding Shadow Falls/Finn's Glenn; West Summit Avenue on National Register of Historic Places.
Edgcumbe Stream	Opportunity Rating	Medium
	Location	Edgcumbe/St. Paul Ave to Mississippi River
	Opportunity	
	Constructability*	High
	District Goals**	Medium
	Additional Highlights: Why Is This Site A Good Candidate?	Corridor along St. Paul Avenue parkway; possible pilot Street Edge Alternative (SEA) site (as used in Seattle, WA); large-lot industrial corridor at southernmost section; approximation of historical stream.
Highland Creek	Opportunity Rating	Medium
	Location	Highland Golf Course to Mississippi River
	Opportunity	
	Constructability*	High
	District Goals**	Low
	Additional Highlights: Why Is This Site A Good Candidate?	Through open space; potential park/golf course amenity; some design flexibility; flow input from springs or leaking water storage tanks?; close approximation of historical stream.
Loeb Creek	Opportunity Rating	Low
	Location	Como Lake "to" Loeb Lake along Maryland Avenue
	Opportunity	
	Constructability*	Medium
	District Goals**	High
	Additional Highlights: Why Is This Site A Good Candidate?	Connects two District resources of interest; facilitates recreational movement across District; existing drainage infrastructure at low point of Maryland Avenue.

Rice's Brook	Opportunity Rating	Low
	Location	Irvine Park through Science Museum to Mississippi River
	Opportunity	
	Constructability*	Medium
	District Goals**	Medium
	Additional Highlights: Why Is This Site A Good Candidate?	Downtown amenity and artistic opportunity; high visibility; approximation of historical stream, Rice's Brook.
Gateway Creek	Opportunity Rating	Low
	Location	Gateway Trail to Trout Brook
	Opportunity	
	Constructability*	Low
	District Goals**	High
	Additional Highlights: Why Is This Site A Good Candidate?	Existing bicycle trail; connected to Trout Brook.

Implementation Costs

The costs to implement stream corridor restoration during the period of this plan are shown in **Table 2**.

Table 2 Stream Corridor Restoration Feasibility Study and Implementation Costs

Implementation Program	Description	Budget	Timeline
Feasibility Study	Feasibility Study for 4-6 Stream Corridor Restoration Sites	\$500,000	2011-2016
Implementation of Projects	Implementation of 1-3 Stream Corridor Restoration Sites	\$3,669,000	2014-2019

