

# Lyell's Brook Recreated: A Green Infrastructure Corridor to the Raritan River

*...to re-orient the citizens of New Brunswick towards their river(s), historical and future sources of industry and well-being in the city...*



From the Bloustein School and the Roosevelt Elementary School through the NB Free Library and Guest House, Willow Grove Cemetery to Boyd Park and the Raritan River



## RAIL - ARTS - RIVER

*using art, green infrastructure and celebration to  
connect New Brunswick's neighborhoods to the Raritan*

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## New Life for a Buried Stream: Restoring New Brunswick's Lyell's Brook

### Proposal Overview

The last two hundred years have not been kind to New Brunswick's historic Lyell's Brook. In 1716, Middlesex County Commissioners began the process of covering the waterway with roadways, following part of "ye Ancient Way" of the Navesink. Hydraulic pumps were worked by Lyell's Brook for copper mining during the latter part of the 1700s. Throughout the 1800s effluent pollution from tanning, "an odoriferous trade," sullied the waters. Maps from the 1850s reveal a new name for the waterway: "Tan Pit Brook." In the ensuing years Lyell's Brook was confined into pipes, it's associated wetlands filled, and the waterway completely disappeared from our City's maps.

Although missing from official documents and maps, our buried Lyell's Brook makes its presence known during rain events. Overflowing storm sewers, flooded roadways (particularly the low-lying portions of Nielsen and Burnet Streets) and wet walls and basements are the result of waters that cannot find room in underground pipes. Erosion of the retaining walls in Willow Grove cemetery and the nearby Tabernacle Church property are also signs that our stormwater infrastructure cannot accommodate the flow of the stream underground.

Regrading, revegetating and re-establishing Lyell's Brook in (or close to) its original channel presents an opportunity for more than just relieving stormwater choke points and flooding that aggravates erosion and intensifies pollution. It also presents an opportunity for public involvement in an environmental restoration effort that can yield multiple community benefits: better stormwater management, improved pedestrian connections, new public open space, increased opportunities for physical activity, improved safety, and a renewed connection to our natural history and Raritan River.

Our goal is to create a new pathway and restore green space between our downtown core and the Raritan River following the original course of Lyell's Brook. We propose to restore New Brunswick's historic Lyell's Brook corridor as a community space for physical activity, play and active transportation. Daylighting Lyell's Brook will increase access to nature and greenery, and can serve as a metaphor for improved community connections. As part of this proposal we also envision strategic incorporation of a program of workforce development for older youth to provide job training in Green Infrastructure design and implementation, landscaping, and advocacy.

Daylighting Lyell's Brook will increase access to nature and greenery, and can serve as a metaphor for improved community connections. Our proposal is to engage in a series of guided community conversations around distinct segments of the buried Lyell's Brook between 33 Livingston Avenue (Rutgers Bloustein School/ Mason Gross) and the Lyell's Brook outfall into the Raritan River to create a linked set of community generated plans to "daylight" the waterway. While the community conversations should yield the actual design proposals, we expect that in some areas this would entail actual hydraulic diversions where they are most needed to



**Historical path of the now buried Lyell's Brook**

**Green Infrastructure Corridors could capture underused green space in the city for public enjoyment, stormwater management and safer access to the Raritan River**

reduce flooding and erosion impacts. In other areas this would be accomplished by the creative use of plantings and green infrastructure so as to minimize costs and disruption to existing infrastructure.

We would use the 2010 Historic Preservation Plan for the Willow Brook Cemetery (at the New Brunswick Free Public Library) as the springboard to conversations, and from this begin to shape a new, inclusive public engagement process around public space and health equity in the Lyell's Brook corridor. Additional conversations hubs could include Rutgers property at 33 Livingston Avenue, the Hope VI community at George Street, Tabernacle Baptist Church, the Elijah's Promise Community Garden on Tabernacle Way/Oliver Street, the hope VI development on Nielsen, and Boyd Park. We envision distinct physical, mental health and well being benefits not only of completed open spaces in our community, but of equity in process.



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## Programming: Using the Spaces

### Lyell's Brook Corridor as Living Learning Laboratory

In the past two years Rail Arts River Partners have:

- Facilitated socially engaged science and arts curriculum in public school systems
- Designed and installed permanent public artwork that serves as civic pride, way-finding, and beautification
- Engaged students in summer enrichment programs that expose students to STEAM curriculum.

Rail Arts River Partners Creating Lyell's Brook Inspired Programming

During Summer 2018, two separate week long enrichment programs offered area youth opportunities to learn about watersheds, civic science, stewardship, and community health using Lyell's Brook and the surrounding area as a research laboratory. One program focused on learning from the landscape to understand how watersheds work, and to identify stormwater management techniques for public health and water quality improvements. The other focused on creating art-work about the Watershed. These initiatives showed there is a great opportunity for using the Lyell's brook corridor in more dynamic ways



through innovative programming.

### The Future Programming Potential of the Lyell's Brook Corridor

We view Lyell's Brook as a place where students of all ages can experience the intersections of art, culture, history, urban design, and civic process and where area educators can learn how to work on collaborative creative problem solving models. Future educational programming may include:

- 1) Environmental Remediation
- 2) Historic Preservation
- 3) Process of Urban Development
- 4) Cultural Celebration
- 5) Physical Wellness and outdoor activity
- 6) Urban Smart Design and Development

### Proposal to use Lyell's Brook Corridor for Arts, History, Science Sharing

Rail-Arts-River Partners are currently seeking funding for a new immersive theater and education experience that could use the Lyell's Brook Corridor as the setting for an audience-engaged performance. This performance would involve the audience as the "citizen scientists" of 1700s to recreate the "Scientific Parties" of a time when non-expert citizens were regularly involved in the exploration and discovery of the natural world.

Citizen science as an activity emerged in the 1600s and 1700s along with the so-called "new science" itself, which emphasized direct observation of nature, a spirit of questioning, and a culture of openness that invited anyone to access and add to the communal stores of knowledge about nature. Today, citizen scientists continue to contribute as nonprofessional members of the scientific community. They often supply information and specimens to non-profits and government groups for improved understanding of the local environment, and for big-data projects that can lead to new discoveries about the natural world.



Led by professional actors and scientists, the audience will consider the observation of nature a part of everyday life, and they will understand how even today ordinary people can generate new data and understandings about the natural world. This performance will take as its subject current local projects that involve citizen scientists in data collection and data reporting. However, this will be done with a twist: the audience would be invited to "perform" with period actors to consider the projects as if they were aspects of the emerging field of scientific study of the 1700s. This period setting would allow for additional sharing of the early history of New Brunswick and the Willow Grove cemetery.

#### Daily Use

**Recreation \* Playing \* Exploring \* Learning  
\*Commuting \* Nature Walks \* Community  
Events \* Reading \* And more**



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## Project Facilitation

### Phasing

The potential phasing of sub-projects to complete the corridor path and green infrastructure is roughly delineated by the drawings that follow in this set. Sub-projects include:

1. Intersection of Livingston and New
2. Crossing at Roosevelt School
3. Feature in front of Guest House
4. Gateway, "Reading Room" and Ramp behind the New Brunswick Free Public Library
5. Willow Grove Green Infrastructure and Path
6. Willow Grove Historic Restoration
7. George Street Crossing
8. Vacant Lot "Pop-Up" Rain Garden/Gathering Space/Path
9. Promise Garden Path and Green Infrastructure
10. Nielson Street Crossing
11. Vacant Lot "Pop-Up" Rain Garden/Gathering/Path
12. Riverside Hope Manor Community Center
13. Water Theme Playgrounds and Gateway to New Street Overpass to Boyd Park

### Partnering

The Rail - Arts - River partnership has shared its work with many local organizations that have expressed commitment to partner. These include: the City of New Brunswick, Dev-Co, the City of New Brunswick Environmental Commission and the City of New Brunswick Parks & Gardens Commission, Middlesex County, New Brunswick Cultural Center and New Brunswick City Center. Following the proposed phasing schedule, each area presents the opportunity to make the pathway responsive to landowner and adjacent property needs. Groups with interest in adjacent areas would be welcomed into the process of design and implementation, such as: the Roosevelt School, the developer of the New Street property, NBFPL, Guest House, Historical Commission, Willow Grove Cemetery, Welden and George Street neighbors, Elijah's Promise and Promise Gardeners, the Abundant Life Church and the Riverside Community.

## Workforce Training

### Example programs include: Philadelphia and Camden PowerCorps, part of AmeriCorps

Camden: "Member Duties : Camden PowerCorps members assigned to crews directed by Center For Family Services are responsible for the implementation of environmental projects that build, maintain, or restore Camden's green infrastructure. Members provide direct service to tackle pressing environmental challenges, including storm water mitigation through project such as building and maintaining rain gardens, porous surfaces, rain barrels, and much more. Members will also prevent flooding in the City of Camden through improving and restoring public lands through invasive species removal. Additionally, corps members serve to strengthen their job readiness skills and enhance their relationship with communities more broadly through serving these communities.

#### Program Benefits :

Stipend , Training, Health Coverage, Childcare assistance if eligible, Education award upon successful completion of service .

#### Terms :

Permits attendance at school during off hours , Uniforms provided and required, Permits working at another job during off hours.

#### Service Areas :

Community and Economic Development, Neighborhood Revitalization, Environment .

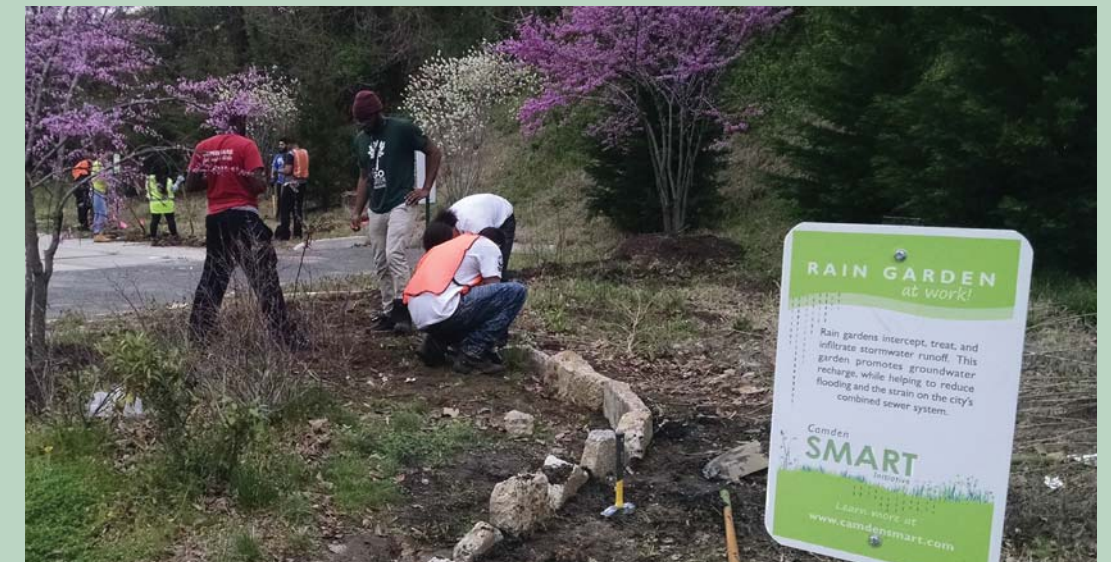
#### Skills :

Environment, Team Work."

**AmeriCorps:** <https://tinyurl.com/yd5lbv8z>

**Camden PowerCorps:** <https://www.centerffs.org/power-corps-camden>

### Camden PowerCorps (an RCE partner)



### Rutgers VETS program in Newark





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*We envision a restored Lyell's Brook as a pathway for people and water that responds to the various contexts it passes through. This would involve both literal and virtual daylighting, and a phasing of discrete projects that respond to community interests and needs. In what follows we highlight several contexts for restoration and possible design interventions.*



**Tabletop Pedestrian Zone at Livingston Avenue and New Street**

## 33 Livingston Avenue

The Edward J. Bloustein School / Mason Gross School of the Arts sits atop the “headwaters” of Lyell’s Brook. At this location we imagine capturing water from the roof and directing it to cisterns. This could include a semi-temporary installation on the façade of the building. This could include a “living wall” installation in the underground parking garage. This could also include a more permanent reconfiguration of the existing paving and vegetation, and a redesign of the (gated) parklet on New Street, to both maximize stormwater capture and open this space to the public.

## “Complete Streets”

New Brunswick and Middlesex County are at the forefront of “Complete Streets” with respect to accommodating bicycle and pedestrian traffic. The Middlesex County road diet initiative presents a perfect opportunity to integrate Middlesex County’s “Complete Streets” traffic calming for Livingston Avenue with stormwater management. A “Complete Streets” approach may involve table-topping, curb cuts and other safety features to slow traffic and create a more pedestrian friendly environment as well as rain gardens, stormwater capture and other habitat connectivity exercises.



**Table Top Intersection, Peoria, Illinois**  
<http://www.terraengineering.com/main-and-university-intersection/>



**Green Streets Diagram**



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## Front of the New Brunswick Free Public Library

The NBFPL is a hub of activity, serving as a community resource and also as a bus stop location. Outdoor spaces at the NBFPL are the perfect location to begin to interpret the history of Lyell's Brook, and to trace the history and present a future vision for New Brunswick's environmental health. Lyell's Brook is named after Nathaniel Lyell, a tanner. Tanning was an intensively polluting industry, and this location can be considered the City's first polluted site. Possible interventions might include interpretive infrastructure at this location that frames environmental improvement as a new and driving industry for the City of New Brunswick.



Science education landscape feature



Interpretive signage



Powhatan Springs Park, Arlington, VA



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Tabletop Connection to Roosevelt Elementary School

Ramp Gateway to the Lyell’s Brook Pathway and Gardens

## Roosevelt Elementary School

Roosevelt School would be another wonderful starting point for the recreated Lyell’s brook. The LRWP initiated a planning process for virtual habitat connection (sidewalk painting) between the Roosevelt School site and the New Brunswick Free Public Library and has engaged all relevant partners in planning and preparation. Given that Middlesex County is preparing a road diet on Livingston Avenue, the habitat connectivity intervention at this location is on hold, however examples of the planned intervention can be seen at Lord Stirling School on Redmond (see images).

## Hardscape Space Behind New Brunswick Library and Henry Guest House

In an effort to improve the connection between the Willow Grove cemetery landscape and the changes proposed for Livingston Avenue (Roosevelt school and 33 Livingston) we propose a major grade change in the asphalt corridor behind the NBFPL and the Henry Guest House. This could be done in coordination with the 2010 preservation plan for Willow Cemetery, which suggests creating a more serpentine, passive, ecologically detailed walk along the cemetery’s edge. These changes may include e.g. wall improvements, green infrastructure, and rain garden pockets in any space available. This may also include creating a new opening into the Cemetery, with stairs entering from the NBFPL parking lot. This could be an invitation to people to explore an experience the area.

**\*\* See Detail Sheet for Gateway and “Reading Room” Areas  
Cost Projection**



New York Public Library and German  
“Reading Cities” Movement





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## Willow Grove Cemetery at Hope VI / George Street

At the other side of the cemetery is a wonderful low point in the landscape. There are abundant wetland plants, and the oldest graves in the cemetery (dating at least to 1759) are currently overgrown with vegetation. A massive pile of bases for headstones, approximately 200 pieces of stone, could possibly be respectfully re-used in this project. These stones could define a border for beautiful meadows, and allow access to this great municipal historical resource and much needed green space.

**\*\* See Detail Sheet for Willow Grove Area Cost Projection**



Mount Olivet Cemetery Rain Garden Project, Catholic Cemetery



Saw Mill River Daylighting - Capture the Look and Feel of a Brook



Enjoying some fresh air at Oakland Cemetery's Sunday in the Park Festival in Atlanta; Credit: Krista Turner Photography



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## “Bridging” over George Street

Adjacent to the Tabernacle Church are two fenced off vacant lots. Our understanding is that developers are waiting for market improvements to develop this space. In the mean time we suggest working with the Church to use these spaces temporarily as a path for low cost Green Infrastructure, while simultaneously reconfiguring their parking lot to increase parking spaces and also stabilizing the adjacent eroding hillside. If this space is eventually developed, we could easily reroute the pathway up George Street through Tabernacle / Oliver Street and Elijah’s Promise’s Promise Garden. The idea is to make a connection to the garden through stormwater management.



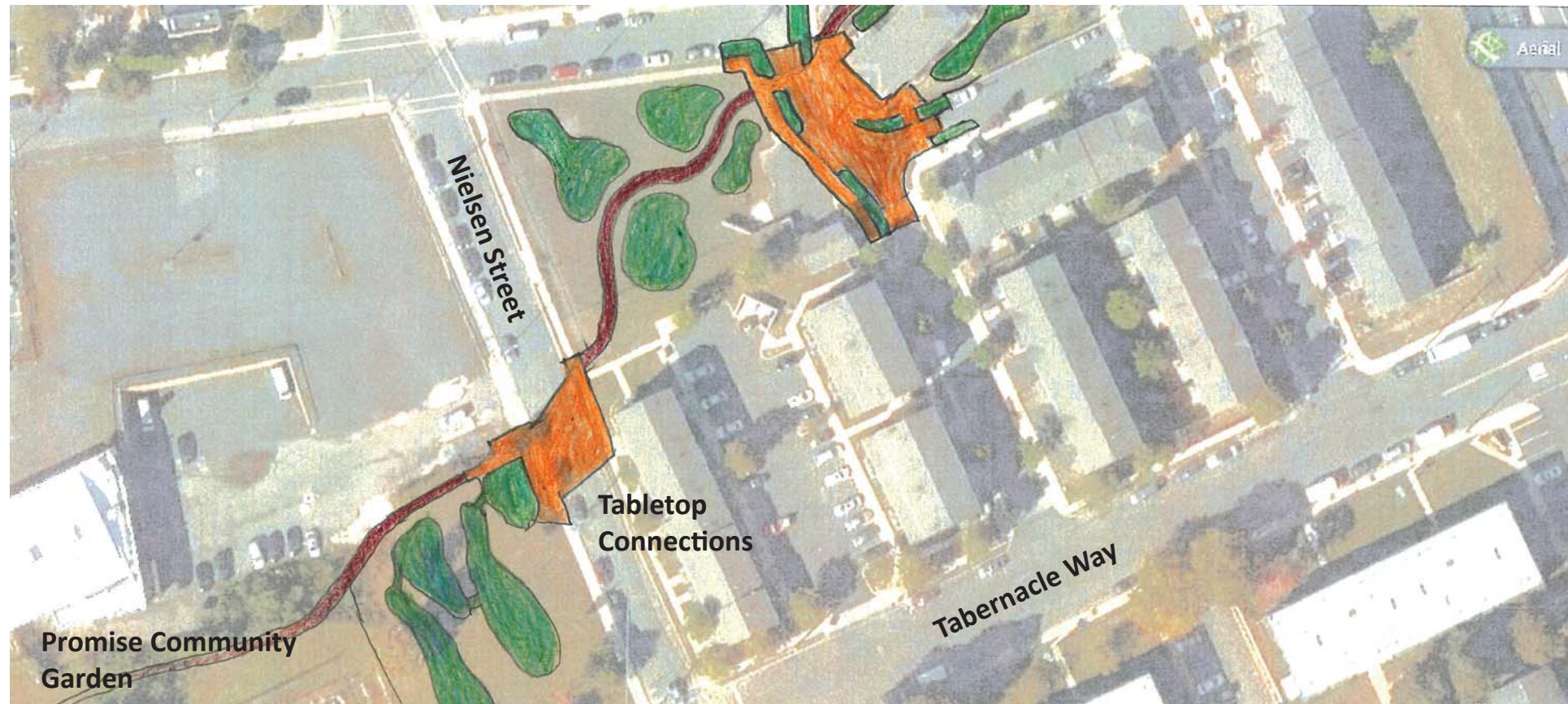
Rutgers Cooperative Extension’s Design/Built Rain Gardens and Fitness/Nature Path at the Hillsborough, NJ Municipal Building



Stormwater and Art at a community garden in Philadelphia



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## “Pop-Up” Temporary Gardens

Temporary Rain Gardens, meadows, gathering spaces and paths can make vacant lots attractive while they await redevelopment. The constructions can be used to train volunteers and Workforce Training Program participants in construction methods and maintenance practices. Alternative routes for the pathway will be drawn for post-development conditions around the currently vacant lots on George and Nielson.



Example of proposed rejuvenation of underused edge/infrastructure spaces. Miami Underline, James Corner Field Operations



Buffalo Bayou: urban nature path and flood storage, Houston, TX



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## Hope VI Apartments on Nielsen to Boyd Park

We envision a continuous path across Nielsen Street through the common areas of the HOPE VI development. This is an area that tends to flood even with small storms. We would imagine integration of significant swaths of Green Infrastructure in the neighboring streets. The idea is to trace a pathway through community center area, across Riverside Drive, and into the green lawn area near the playground. We conceive of a different type of Green Infrastructure playground in this space, a playground that is safe for kids but beautiful and functional in terms of stormwater capture. The pathway would terminate at the stairway that leads up to the New Street Bridge, bringing it up to and through Boyd Park.



Rain Gardens at the Oregon Convention Center, Portland



Image Credit © OLIN/Sahar Coston-Hardy



Water pump playground



# Lyell's Brook Recreated: A Green Infrastructure Corridor to the Raritan River

Area: Livingston Avenue: Lyell's Tanning Pond:  
A Water Pollution Interpretation Garden



## General Cost Projections (Material & Install Only):

### Livingston @ Morris Ave:

Pathways, 8' width [Red] (1300 sf):

Asphalt: \$3,900

Concrete: \$7,800      Avg.: \$4,766

Stone Dust: \$ 2,600

Paved Areas [Orange] (2000 sf):

Cost: \$40,000

Green Infrastructure [Green] (1600 sf):

Cost: \$32,000

Lighting (#): 20 ct.

Cost: \$60,000

Seating (#): 10 ct.

Cost: \$20,000

Signage (#): 3 ct.

Cost: \$3,000

### Interactive Landscape Feature:

**The Importance of Water in Society:**

**Past, Present and Future in New Brunswick:**

**Cost: TBD**

**Total Livingston and Morris Area:**

**\$160,000**

### Streetscape Entry to Cemetery

**(Potential Ask for Block Development):**

“Complete Street”

Paving and Green Infrastructure: \$500 lf x 130lf = \$65,000

Street Trees: 30 ct. @ \$500 ea. = \$15,000

Lighting: 20 ct. @ \$3,000 ea. = \$60,000

**Total Streetscape: \$140,000**



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General Cost Projections (Material & Install Only):

New Brunswick Free Library “Reading Room” and Gateway to the Lyell’s Brook Path

- Pathways [Red] (5,200 sf):
  - Asphalt: \$15,600
  - Concrete: \$31,200
  - Stone Dust: \$ \$10,400
  - Avg.: \$15,733
- Paved Areas [Orange] (2,000 sf):
  - Cost: \$40,000
- Green Infrastructure [Green] (5,000 sf):
  - Cost: \$100,000
- Ramp:
  - Retaining Wall: \$75,000
  - Paving: \$7,200
  - Railings: \$30,000
- Lighting (#): 50 ct.
  - Cost: \$150,000
- Seating (#): 20 ct.
  - Cost: \$40,000
- Signage (#): 6
  - Cost: \$6,000

Total Free Library “Reading Room” and Lyell’s Brook Path:  
**\$ 464,000**



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General Cost Projections (Material & Install Only):

Green Infrastructure Path

- Pathways [Red] (5,200 sf):  
Asphalt: \$20,800  
Concrete: \$31,200      Avg.: \$20,000  
Stone Dust: \$10,400  
Paved Areas [Orange] (1,000 sf):  
Cost: \$20,000  
Green Infrastructure [Green] (8,000 sf):  
Cost: \$160,000  
Lighting (#): 40  
Cost: \$120,000  
Seating (#): 30  
Cost: \$60,000  
Signage (#): 8  
Cost: 8,000

Total GI Path: **\$400,000**

Cemetery Restoration:

- Path Repair: 1,500 lf x 10' = 15,000 sf  
Cost: \$90,000  
Green Infrastructure Stormwater Mgmt.:  
6,000 sf  
Cost: \$120,000  
Headstone Repair: +/- 100 ct. @ \$100 ea.  
(Redrill, Rebar, Mortar)  
\$10,000

Total Cemetery Restoration: **\$220,000**