

BRICKLINE RAISE GRANT



SUBMITTED BY: GREAT RIVERS GREENWAY

Project: Brickline Greenway:
Fairground Park to City Foundry Connector
Location: St. Louis, Missouri

RAISE GRANT Request: \$24,700,000
Date: July 12, 2021
Webpage: www.GreatRiversGreenway.org/RAISE

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1. EXECUTIVE SUMMARY

The Brickline Greenway is a major public-private partnership to bring to life a greenway network of up to 20 miles of accessible multi-use pathways where people can walk, run, bike, push a stroller or roll a wheelchair. The project will connect the city's vibrant neighborhoods, parks, business and arts districts, transit hubs, and myriad cultural and educational institutions while promoting equity, economic development, environmental leadership, active lifestyles and connectivity. The first segment of the Brickline Greenway opened to the public in 2018, in conjunction with the TIGER Grant-funded Cortex MetroLink Station. RAISE Grant funding will enable Great Rivers Greenway to leverage local resources from public, private and institutional sources to accelerate development of the segment of the Brickline Greenway from Fairground Park to City Foundry. This proposed route connects predominantly Black neighborhoods that have experienced generations of disinvestment, racial discrimination, poverty, poor public health and decreased quality of life. This project will enhance access to jobs and educational opportunities, currently exacerbated by poor transportation infrastructure, transit dependency and isolation, as evidenced by high crash and fatality rates. The people in these neighborhoods deserve a high-quality greenway that is vibrant, welcoming and safe. This project will deliver those benefits to people while enhancing the environment and economy in an equitable way.



Great Rivers Greenway has always valued meaningful community engagement to design, build and manage high quality public facilities that are welcoming and representative of the neighborhoods they serve. Engagement for this project has been carefully structured to ensure that community voices shape plans for the greenway. Working groups have helped form strategies for diversity, equity and inclusion; universal design; and economic development in addition to identifying specific opportunities and concerns of local residents. Since 2017, more than 250 individual stakeholder meetings have been held with local residents, institutions, elected officials, artists, government agencies and more. Collectively, the various Brickline Greenway routes—to Fairground Park, the National GeoSpatial Agency, Forest Park, City Foundry, Saint Louis University, Harris-Stowe State University, Gateway Arch National Park, Grand Center and the new Major League Soccer Stadium—will greatly expand access among surrounding neighborhoods and popular destinations, serving an ever-increasing share of St. Louisans who demand—and will benefit from—high quality, safe dedicated bicycle and pedestrian facilities like this.

2. PROJECT DESCRIPTION

The requested RAISE Grant funding amount is \$24,700,000 for the Brickline Greenway: Fairground Park to City Foundry Connector.

Beginning at the southeast corner of Fairground Park, the project will construct a greenway that will cross Natural Bridge Road (MO Route 115) on the west side of the N Grand Blvd intersection. The greenway will continue south along N Grand Blvd to the southwest corner of the intersection at Cass Ave. The path will turn west, traveling along the south side of Cass Ave to N Spring Ave, where the greenway proceeds south along the east side of the road, stopping at Lindell Blvd. The greenway will use the existing pathway through the St. Louis University campus; this section is not part of the grant request. The greenway will start again at Laclede Ave, proceeding south to end at the southwest corner of Forest Park Ave at Spring Ave. The new greenway totals 2.16 miles (see Figure 2.1).



The Brickline will reduce travel lanes on N Grand Blvd, Cass Ave, and N Spring Ave from their current configuration of two 11-foot travel lanes in each direction to one 11-foot through travel lane in each direction (see Figure 2.2). N Grand Blvd and Cass Ave will also have a 12-foot center space for separate left turning traffic at entrances and intersections. One option under consideration includes planted medians between intersections when not accommodating left turn movements. Portions of the alignment will accommodate an 8' on-street parking lane.

This reduction in pavement allows for a walking and biking path at sidewalk level, separated from vehicle travel lanes by a curb, and street trees and streetscape features along the route. The width of the greenway fluctuates between 24 and 60 feet. This is due to existing public right-of-way that varies between 56 and 120 feet on N Spring Ave, Cass Ave, and N Grand Blvd. Cross-sections and graphic renderings of the corridor are provided as supplemental documentation in Appendix D. The opposite side of the street from the greenway will be improved only at signalized intersections to address ADA accessibility.



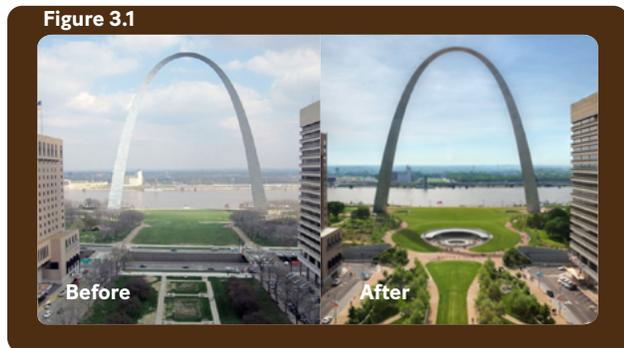
The majority of traffic signals along the route are aged and will be upgraded with this project. This includes fiber interconnect and standard Intelligent Transportation System (ITS) equipment as required by St. Louis City or the Missouri Department of Transportation (MoDOT). The already-updated MoDOT traffic signals along the route will be optimized and adjusted per MoDOT standards. A Rectangular Rapid Flashing Beacon will be installed at N Grand Blvd and Montgomery Street.

The portion of greenway along N Grand Blvd parallels one of the busiest MetroBus lines in the entire transit system. The project team will coordinate closely with Bi-State Development Agency as they upgrade the corridor with electric buses and charging stations along the route. At the south project limits, existing sidewalks lead pedestrians and bicyclists another ¼-mile to the Grand MetroLink Station, one of the busiest transit hubs in the system. A future separate project will investigate route options to connect the Brickline Greenway fully to the Grand MetroLink Station.

The Benefits-Cost Analysis shows a Benefit Cost Ratio of 4.61.

3. PROJECT HISTORY

The Brickline Greenway: Fairground Park to City Foundry Connector is a vital corridor that builds on efforts begun more than two decades ago. In the late 1990s, civic leaders envisioned a pedestrian and bicycle corridor to connect the Gateway Arch to one of the nation’s greatest urban public parks — Forest Park. In 2013, a coalition of organizations led by Great Rivers Greenway worked together on a sales tax ballot measure to help fund the the [CityArchRiver](#) project, a \$380M renovation of the Gateway Arch National Park and its surrounding areas in downtown St. Louis (see Figure 3.1). The project reimagined and restored the grounds of the Jefferson National Expansion Memorial (now called Gateway Arch National Park) and created a land bridge over the interstate to allow safe and direct pedestrian access to one of the nation’s most recognizable landmarks — the Gateway Arch.



At the same time, significant redevelopment initiatives in the Midtown area were reaching a critical mass. Local leaders recognized the opportunity to capitalize on the momentum of these developments and launched the Midtown Loop Trail Feasibility study to investigate how to connect the burgeoning development to assets like Forest Park and the St. Vincent Greenway via multimodal facilities. The findings of that study led directly to a successful 2014 TIGER Grant award for a \$12M new multi-modal transit station and the first segment of the Brickline Greenway (formerly Chouteau Greenway) within the Cortex Innovation Community.



Following the successful completion of CityArchRiver and Cortex MetroLink Station projects and to counter decades of disinvestment in North St. Louis City, the opportunity and urgency to expand investment beyond the central corridor became apparent. In 2017, a coalition of partners led by Great Rivers Greenway (GRG) launched an international design competition with the aim to develop a framework for a 20-mile greenway network to link the city’s major public institutions and assets (see Figure 3.2). Unlike previous efforts, the task was to not only design a greenway that features an east-west corridor, but also to connect the heavily segregated north and south neighborhoods to knit together a socially and economically divided city. The design competition yielded 19 proposals from 12 countries. A jury identified four teams to develop concepts, which were vetted through community engagement, and finally selected the Stoss Team for their focus on equity and economic development.

Since day one, the process has centered on community engagement to create something not only uniquely St. Louis, but also that considers equitable social, environmental and economic impact at every turn. To create the Chouteau Greenway Framework Plan (now Brickline Greenway), GRG assembled a steering committee and four working groups from 125 institutional partners, neighborhood representatives, private funders, and city staff who came together to guide the design. With the help of an “Artists of Color Council,” the team

4. PROJECT LOCATION AND COMMUNITY CONTEXT

The Brickline Greenway: Fairground Park to City Foundry Connector is located in St. Louis, Missouri, part of the St. Louis MO-IL Metropolitan Area (see Figure 4.1). The project will span a large portion of North St. Louis, an area that includes the Fairground, Jeff Vanderlou, Covenant Blu-Grand Center, and Midtown neighborhoods. The project area is comprised of six census tracts, three zip codes, three aldermanic wards, and impacts approximately 15,600 residents.

The City of St. Louis and its surrounding communities have experienced decades of economic underperformance, population stagnation, and racial division. The St. Louis region has seen minimal recovery from the Great Recession, with regional gross domestic product growing by only 5.2% between 2008 and 2018, compared to 20% for the country. The area of North St. Louis where the project takes place has been particularly affected.



North St. Louis (defined here by the three zip codes surrounding the northern part of the proposed Brickline alignment) is 95% Black,

while the city is 46% Black and the surrounding county 24% (see Figure 4.2). Economic conditions and opportunities in North St. Louis are notably worse than in the rest of the city and region:

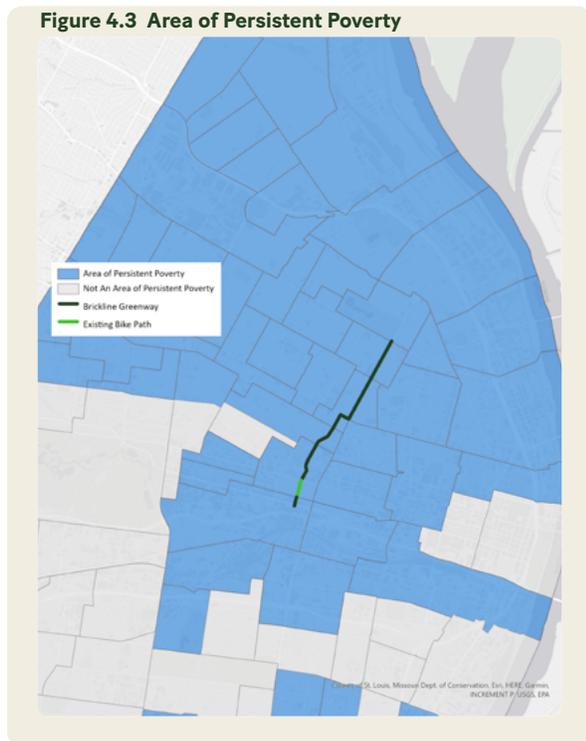
- **THE UNEMPLOYMENT RATE IS 7.4%**, as compared to the city rate of 4.6%.
- **MEDIAN INCOME IS \$27,500**, compared to the city median of \$43,900.
- **THE POVERTY RATE IS 31%**, versus 19% citywide.
- **ONLY 12% OF NORTH ST. LOUIS RESIDENTS HAVE A BACHELOR'S DEGREE** or higher, compared to 35% of city residents.
- **HOMEOWNERSHIP** – the primary source of wealth creation for middle-class households that can create intergenerational wealth – stands, as in the rest of the city, at 43%, much lower than the county's 68%.
- **37% OF RESIDENTIAL STRUCTURES ARE VACANT** in North St. Louis, compared to 19% citywide.



Overall, the lack of investment in North St. Louis, coupled with systemic discrimination, have created an unstable environment that struggles to attract and retain residents. Unsurprisingly, North St. Louis, which has experienced significant out-migration of the Black middle class, is an area of persistent poverty (see Figure 4.3).

The Brickline is among dozens of efforts across the region working in concert to address the challenges identified above. One of the primary goals for achieving success is to prioritize

inclusive and equitable development. As part of the overall Brickline Greenway network, the Fairground Park to City Foundry Connector is a key linkage, bridging the real and perceived barriers separating residents in North St. Louis from the prosperity experienced by other parts of the region. The placement of the proposed alignment directly adjacent to the Fairground Park site is particularly significant – in 1949, Black residents faced racist attacks when the public swimming pool there was integrated, and the pool was closed several years later.



Economic Opportunity

The Brickline Greenway is an opportunity to redress these immense disparities and challenges. First, enhanced connectivity will provide North St. Louis residents access to important local job clusters such as St. Louis University, Cortex, City Foundry, National Geo-Spatial Intelligence Agency (NGA), and the Veterans Affairs Hospital complex, among others.

These clusters not only have high-quality job opportunities accessible to those without a four-year degree, but also host several training programs and local outreach

initiatives. Through this investment, the Brickline Greenway will help to support population stabilization and growth, spur development, and stimulate job and business creation in service of racial equity.

Infrastructure

St. Louis, once the 8th largest city in the nation, reached its peak population in the 1950s with nearly 857,000 residents. Since that time, the population has declined to less than half, with early 2020 census estimates reporting the city’s population below 300,000 for the first time in over a century. Many of the city’s streets were designed to serve a much larger population and higher traffic volumes than current demand. The project is redefining how these assets are used and setting a precedent for prioritizing inclusive investment and quality of life for residents.

Mobility

The population of the project area is highly transit dependent, with over 31% of residents living below the poverty line and a similar proportion of households reporting they do not own a vehicle. It is no surprise that the #70 MetroBus, which parallels much of the project corridor, is the highest volume bus line in the entire system. With 10-minute headways, it makes the corridor a frequent destination for people traveling on foot or by bike and serves as a vital transfer between numerous additional transit lines that intersect the corridor. At its terminus, the Brickline Greenway will provide people safe access within walking distance of the Grand MetroLink Station, a key multimodal hub in the center of the city and a direct link to the light rail system that spans the seven county St. Louis region covering Missouri and Illinois. The corridor will also link into the City’s existing and ever-expanding on-road bicycle infrastructure network.

Equity

In response to the [Ferguson Commission’s call to action](#), a major component of regional initiatives, including the Brickline,

is to address the disparities faced by disadvantaged groups (those most vulnerable to inequity, such as racial and ethnic minorities). As previously noted, North St. Louis has high concentrations of poverty and racial segregation. Currently, no protected space for people on bikes exists in the project area and the nearest available greenway is over 1.5 miles away. [The City of St. Louis Equity Indicators Baseline Report](#), produced in 2018, illuminated how racism has become institutionalized in the region and highlighted key indicators regarding education, employment, health, safety, and justice to measure and improve. The implementation of the Brickline Greenway would positively impact a number of those indicators, including reducing pedestrian injuries, increasing access to healthy food, reducing commuting time, and improving public health. The reduced roadway width would calm traffic. Improved signal timings have the potential to reduce the number of traffic stops, which Black residents are more than twice as likely to experience than white residents in the City of St. Louis. The economic benefits of greenways noted in this report could also improve equity indicators related to financial empowerment and reduce concentrated poverty.

Sustainability

To thrive in the 21st Century, the City of St. Louis must prepare to face new and even greater challenges. Climate change brings both warmer temperatures and increased flood levels near the historic creeks and rivers across the city and region. Aging infrastructure and a shrinking tax base combine to exacerbate physical stresses that make St. Louisans potentially more vulnerable in times of need. To address these concerns, the project includes targeted features to address sustainability.

During the summer months, St. Louisans are especially vulnerable to heat-related hazards. On warm summer days, the city can be as much as 17 °F warmer than its surrounding areas. The city's infrastructure - largely made

up of asphalt, concrete and metal - traps the heat. This is known as the "urban heat island" effect. Heat waves are particularly dangerous for children, seniors, people with cardiovascular disease, and people taking psychotropic and other medications. The Brickline Greenway aims to add over 800 trees to an area nearly devoid of urban forestry (see Figure 4.4). According to the EPA, trees and vegetation lower surface and air temperatures by providing shade and through evapotranspiration. Shaded surfaces, for example, may be 20–45°F (11–25°C) cooler than the peak temperatures of unshaded materials. Evapotranspiration, alone or in combination with shading, can help reduce peak summer temperatures by 2–9°F. Additionally, increasing access to trees has been shown to reduce stress, lower blood pressure, and improve mood.

Figure 4.4



Additional street trees will also play a critical role in managing stormwater. In 2006, sweeping changes in regulations for stormwater management were implemented by the Metropolitan St. Louis Sewer District (MSD) in St. Louis City as well as 59 municipalities within St. Louis County. To support these EPA-mandated regulatory changes, reduce total impermeable surfaces, reduce localized urban flooding, and improve overall water quality, the project will employ specialty soils and pavement systems (e.g. Silva Cells) to support large tree growth and improve stormwater interception and absorption. These solutions will also make the corridor more resilient to future impacts of climate change including heavier precipitation and more frequent extreme weather.

5. GRANT FUNDS, SOURCES AND USES OF ALL PROJECT FUNDING

The total budget of the Brickline Greenway: Fairground Park to City Foundry Connector is \$39,148,576. The RAISE Grant amount requested is \$24,700,000, which is 63% of the total project cost.

The cost breakdown below reflects the construction total, a project contingency, and design and construction inspection (see Figure 5.1). The RAISE Grant will be applied to the construction activities and will not be used for design, community engagement or construction inspection. No other Federal funds have been previously authorized by a Federal agency for this project. Besides the RAISE Grant, the other funding sources for this project are local in nature. Local sources of funding for this project are public funds from GRG (\$9,948,576) and donations from local sponsors and partnerships (\$4,500,000). Letters of financial commitment

from these local partners are provided in the Appendix H. The breakdown of total project cost by source is provided in Figure 5.1. For a detailed opinion of probable cost, see Appendix G.

GRG has a Memorandum of Understanding (MOU) with the City of St. Louis Board of Public Service (Appendix P). The MOU affirms the intent of the parties to work together with respect to the future design, construction, and maintenance of the Brickline Greenway within the City of St. Louis. At this time, that does not constitute a financial commitment due to limitations and other priorities in the City’s budget, but rather supports the project in other ways such as allowing use of the public rights-of-way. This does not preclude the City from assisting with design/engineering or construction funding, should budget become available in the future.

Other grant opportunities, including Federal grants such as Congestion Mitigation and Air Quality (CMAQ) or Surface Transportation Program – Suballocated (STP-S), may continue to be pursued as the project continues forward. At no time will the requested Federal funds constitute more than 80% of project’s total cost should future Federal funds beyond the RAISE Grant be pursued or obtained.

Figure 5.1

GRANT FUND SOURCES BREAKDOWN BY ACTIVITY

Project Activity	Total Cost	RAISE Amount	%	Non-Federal Amount	%
Construction Total	\$ 31,984,130	\$ 24,700,000	77%	\$ 7,284,130	23%
Project Contingency (10%)	\$ 3,198,413	\$ -	0%	\$ 3,198,413	100%
Design & Construction Inspection (12.4%)	\$ 3,966,032	\$ -	0%	\$ 3,966,032	100%
Project Total Costs	\$ 39,148,576	\$ 24,700,000	63%	\$ 14,448,576	37%

6. SELECTION CRITERIA

6.1 SAFETY

Crashes

The safety of people driving, walking or biking along the project corridor is a glaring issue. Crash data from 2015 to 2019 was gathered from MoDOT’s historical crash database to analyze the extent of safety concerns. The project corridor has seen 733 total crashes, with 301 crashes resulting in an injury and seven crashes resulting in fatalities (see Figures 6.1.1 and 6.1.2). These crashes support observations made by traffic engineering consultant Lochmueller Group of high vehicle speeds (20+ MPH over the speed limit), illegal passing, jaywalking, as well as disregard for and non-compliance with traffic signal indications.

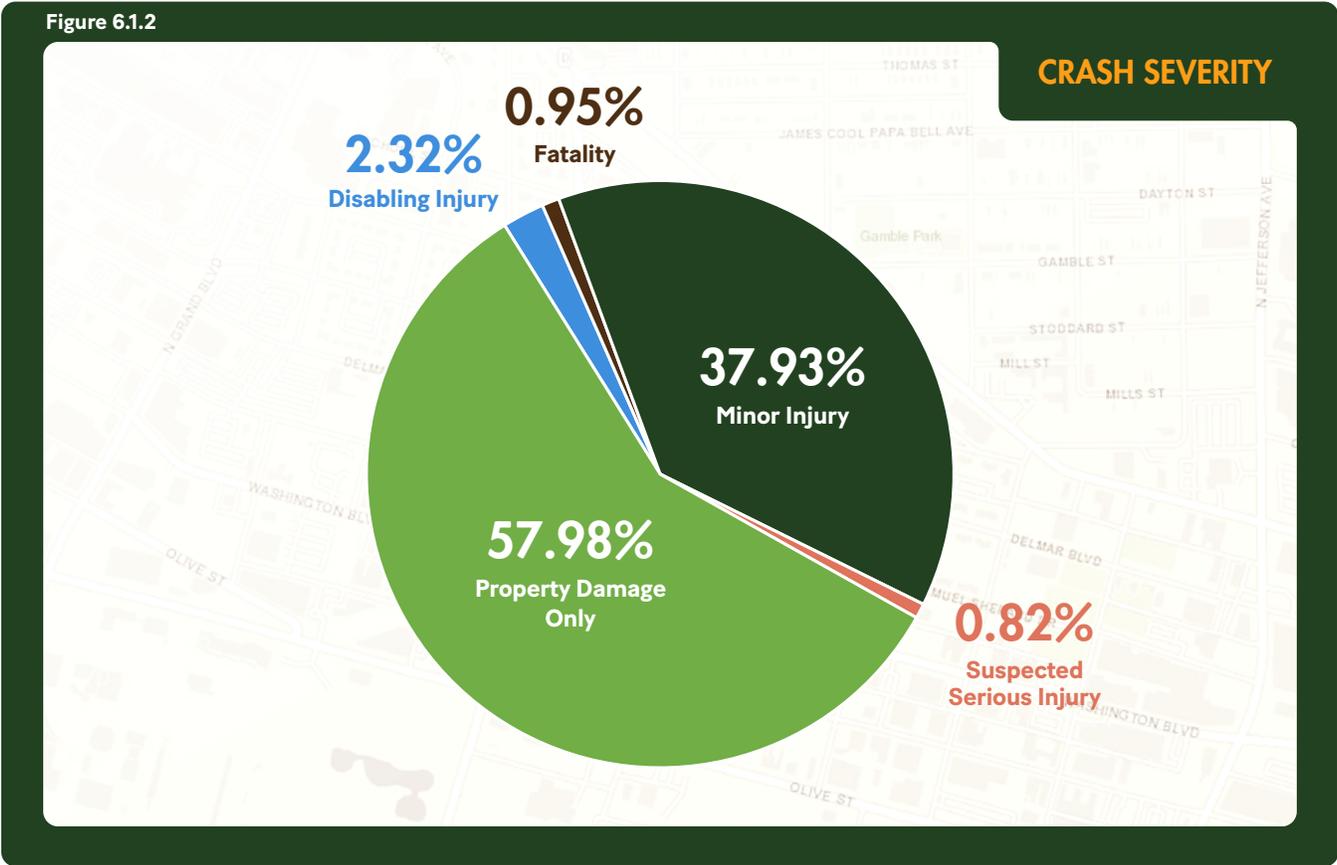
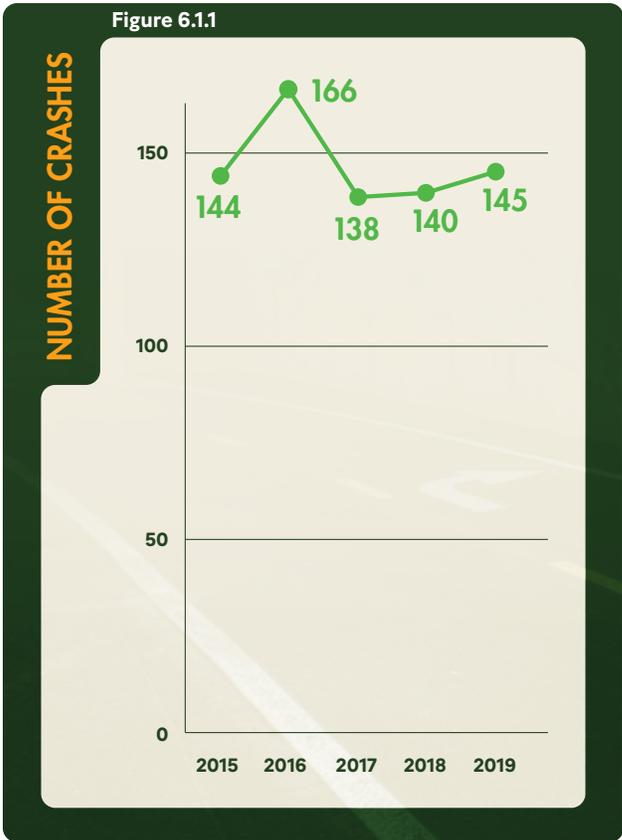


Figure 6.1.3

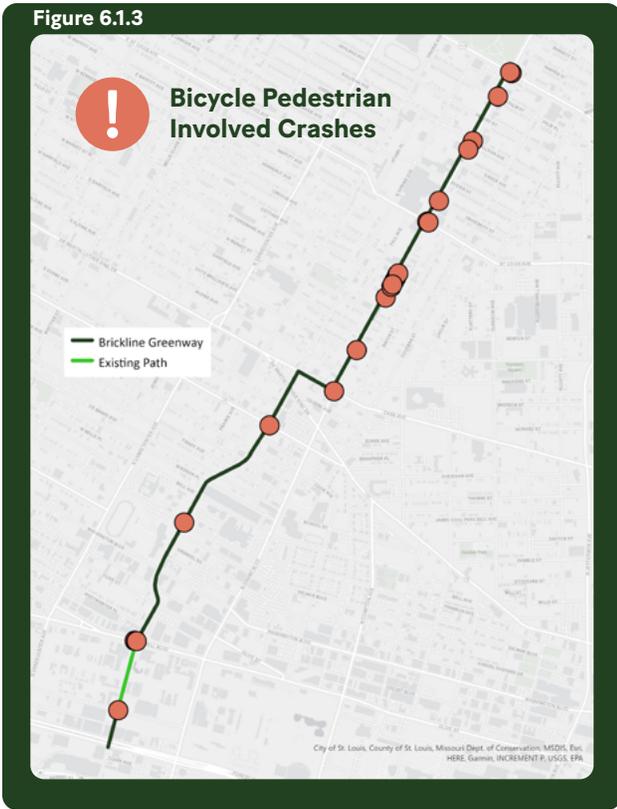


Figure 6.1.4



Alarmingly, there have been 32 crashes involving a pedestrian or bicyclist, all of which resulted in an injury or fatality (see Figure 6.1.3). In a recent study published in the *Journal of Transport and Land Use* (January 2021), N Grand Blvd was identified as one of the highest fatal pedestrian crash hot spot corridors in the United States.¹ The intersection of N Grand Blvd and Montgomery St has seen four fatal pedestrian crashes and is in need of immediate attention and mitigation (see Figure 6.1.4).

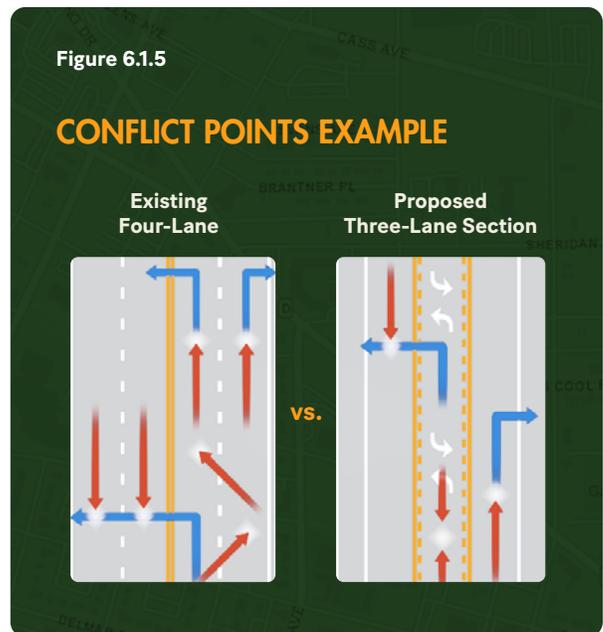
The proposed project is expected to enhance safety for all users along the corridor. The greenway itself will provide pedestrians and bicyclists with a physically separated facility, reducing potential conflict points with vehicles. A new rectangular rapid flashing beacon (RRFB) will be installed at Montgomery St to address the pedestrian fatalities at that particular intersection. Other safety enhancements include upgraded traffic signals and crosswalks.



¹Schneider, R. J., Sanders, R., Proulx, F., & Moayyed, H. (2021). United States fatal pedestrian crash hot spot locations and characteristics. *Journal of Transport and Land Use*, 14(1), 1-23.

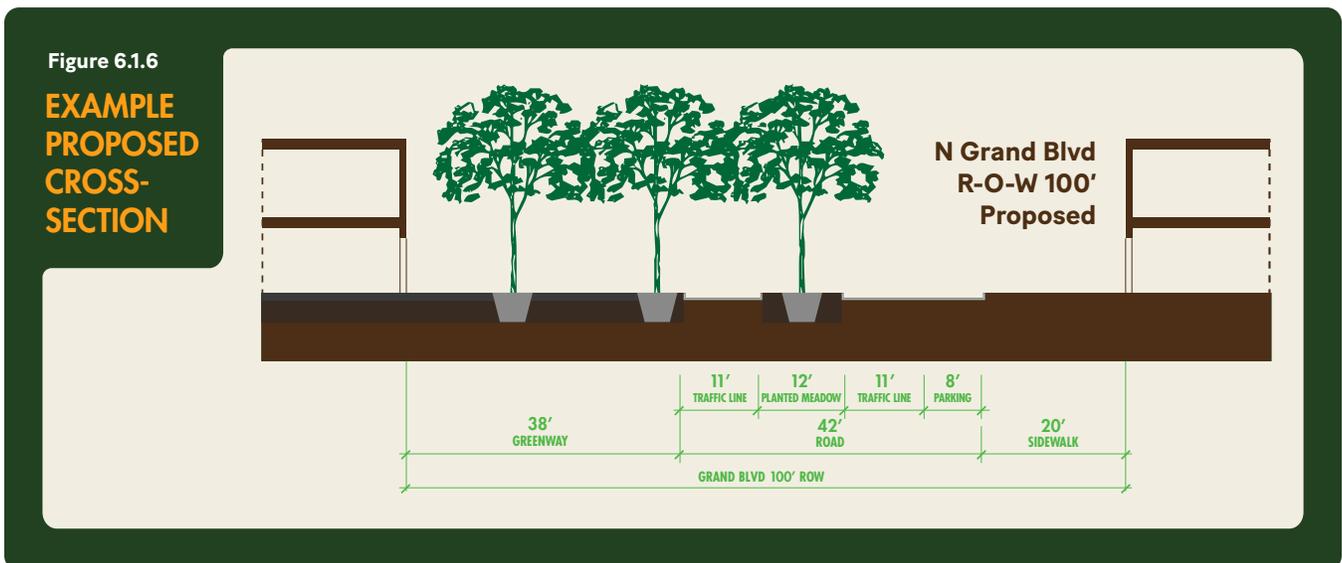
Perhaps the most dramatic and transformative aspect of the project will be lane reconfigurations, also known as a road diet, combined with other bicycle and pedestrian friendly design elements that will enhance the streetscape along the entire project corridor. Cross sections on N Grand Blvd and Cass Ave will be reconfigured from four lanes to three lanes (one lane in each direction plus a two-way left turn lane). The cross section on Spring Ave will be reconfigured from four lanes to two lanes. Road diets offer many safety advantages and the FHWA considers road diets a proven safety countermeasure and a safety-focused design alternative.²

Road diets improve safety in two main ways: reducing vehicle conflict points and reducing vehicle speeds. For a typical cross section on a four-lane undivided roadway, inside lanes in each direction are for both through traffic and turning traffic. This lane configuration creates conflicts points (see Figure 6.1.5 from the FHWA *Road Diet Informational Guide*). A road diet reduces these conflict points by allowing through traffic in only one lane in each direction. The reduction in through lanes also reduces vehicles speeds and limits passing opportunities (see Figure 6.1.6). Bike lanes, pedestrian signage, island refuges, medians, etc. communicate to drivers that lower speeds are required.



Social/Community Cohesion

The project will also incorporate design features that support a sense of physical and psychological safety for all people, on and off the greenway, and a sense of belonging for marginalized groups. These features include lighting, open sight lines, and view sheds that allow for protected places where families and friends can spend time together, secure physical spaces for social gathering, and an environment where perceived boundaries dissipate, and all residents feel welcome.



² https://safety.fhwa.dot.gov/road_diets/

6.2 ENVIRONMENTAL SUSTAINABILITY

The Brickline Greenway will promote environmental sustainability and support specific sustainability initiatives in the City of St. Louis. The City of St. Louis adopted a [Sustainability Plan](#) in 2013. This plan proposes to achieve a 'triple bottom line': a balance of economic health, social equity, and environmental stewardship. The City recognizes its long-term prosperity is intertwined with, and dependent on the enhancement of social and environmental factors. The Brickline Greenway has been identified as a **high priority** infrastructure enhancement to support the objectives outlined within the Sustainability Plan. Most notably, the Brickline Greenway will facilitate safe, accessible, and healthy transportation, reduce greenhouse gases, manage stormwater, and encourage civic engagement. The Brickline Greenway project is expected to demonstrate measurable and non-measurable environmental benefits.

Environmental Justice

Executive Order 12898 directed Federal agencies to develop strategies to address environmental justice (EJ). The U. S. Environmental Protection Agency (USEPA) created the Office of Environmental Justice and leads the charge to integrate EJ policies across agencies. EJ is defined by the USEPA

as, "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." In their simplest terms, Federal actions need to identify if they cause an EJ impact (which is defined as one that disproportionately burdens vulnerable populations).

Equity and public involvement have been key components of GRG's Brickline Greenway strategy. Residents near the proposed project are disproportionately exposed and vulnerable to environmental hazards. The USEPA's EJSCREEN mapping tool was used to better identify communities near the greenway route.³ The results of the EJSCREEN tool demonstrate environmental justice concerns in the areas near the proposed project, as illustrated by the select indicators shown in Figure 6.2.1.

The demographic data identifies that the population surrounding the corridor exceeds 50% for both low income (63%) and people of color (75%). These communities are further demonstrated as at-risk as they are at least in the 90th percentile for additional environmental health risk factor indices which include evaluation for air quality,

Figure 6.2.1

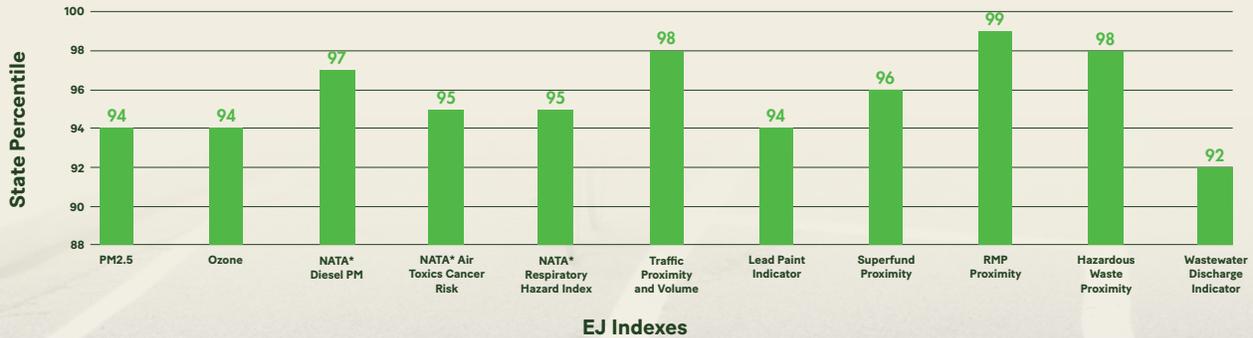
SELECT EJSCREEN INDICATORS

Indicator	Value	State Average	Percentile in State
NATA Cancer Risk (risk per million)	39	32	96 th
NATA Respiratory Hazard Index	0.54	0.42	98 th
Traffic Proximity and Volume	1,700	370	95 th
Hazardous Waste Proximity (county/km distance)	8.8	1.6	98 th
People of Color Population	75%	20%	95 th
Low Income Population	63%	33%	91 st

³ <https://www.epa.gov/ejscreen>

Figure 6.2.2

EJ INDEXES AND STATE PERCENTILES



polluted soils, and buildings likely to contain lead paint or lead pipes (see Figure 6.2.2). For full results of the EJ Screen, please see the Appendix N.

The proposed project will address EJ concerns in various ways. First, as demonstrated in the Framework Plan and throughout this proposal (see section 6.3 Quality of Life), the Brickline Greenway project is focused on equity and public engagement. The project intends to serve as a connecting network for the neighborhoods along its corridor while enhancing pedestrian mobility between the neighborhoods and community resources, without causing displacement. As described in the following sections, the Brickline Greenway will promote environmental sustainability by addressing climate change, mitigating the urban heat island effect, and improving stormwater management and water quality. The benefits gained from this project will primarily affect those living and working near the project corridor.

Climate Change

The proposed project will directly address climate change in a number of ways. Transportation is the largest source of greenhouse gas (GHG) emissions in the US. Carbon dioxide (CO₂) is the most well-known and notable GHG emitted from vehicles;

other GHG emissions from vehicles include methane (CH₄) and nitrous oxide (NO₂). In addition to GHG emissions, vehicles emit other pollutants that negatively impact air quality and are harmful to human and ecosystem health. Oxides of nitrogen (NO_x), sulfur dioxide (SO₂), and particulate matter (PM_{2.5}) are other common pollutants emitted from vehicles that are detrimental to the environment and compound issues of climate change.

The greenway project focuses on improving modal assets for pedestrian and cyclists. As users are provided with safe bicycle facilities and pedestrian friendly design elements, vehicle trips along the corridor will be diverted to walking or bicycling. In addition to modal diversion, the project will reduce vehicle stop/starts by optimizing signal timings. Although travel lanes will be reduced, signal timing optimizations will ensure vehicle travel efficiency and reduce vehicle idle time. Both outcomes will reduce emissions that cause global climate change and environmental damage.

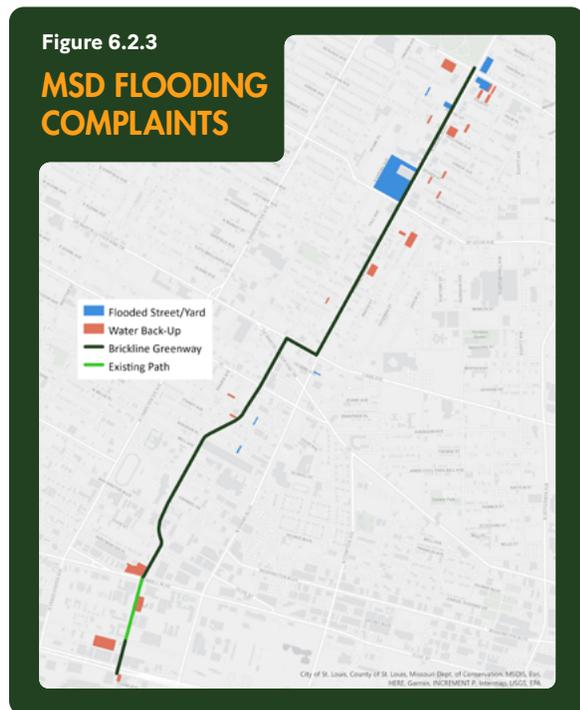
Urban heat islands (UHI) are urban areas that experience higher temperatures relative to nearby rural areas. Urban infrastructure such as roads, buildings, and parking lots, and a lack of tree cover create an environment where more solar radiation is absorbed, causing higher temperatures. A research

report by Climate Central (2014) shows that St. Louis can experience temperatures up to 17 °F hotter than in nearby rural areas and is an average of four degrees hotter in the summer.⁴

Impacts of UHI include negative health outcomes and increased energy use. Higher temperatures can cause increased heat stress, particular for sensitive populations. Higher temperatures also contribute to greater emissions of GHG and other pollutants due to increased energy consumption for cooling. The Brickline Greenway project incorporates over 800 canopy sized trees into the design. The additional tree cover not only provides shade and a cooler, more comfortable corridor, but also mitigates the impacts of UHI. The USEPA promotes the use of tree cover as an effective mitigation strategy for UHI.⁵

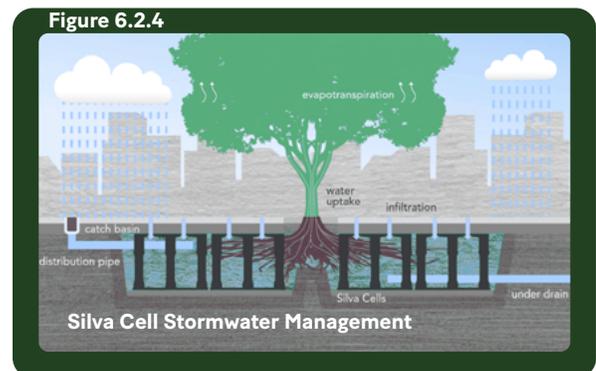
Water Quality

A 'combined sewer' is a sanitary sewer system that is also connected with a stormwater management system. Sewage and rainwater runoff are combined together before treatment and discharge into large rivers.



This type of sewer is very common in St. Louis. During heavy rain events, the sewer system can get overloaded and result in a combined sewer overflow (CSO) where the sanitary system releases untreated wastewater directly into waterways to relieve pressure from the system. These discharges produce significant point source pollution events. A CSO can also affect local neighborhoods when the sewage and rainwater mixture can back up into homes. Figure 6.2.3 shows the water backup and localized flooding events reported to Metropolitan St. Louis Sewer District (MSD).

These CSO events have a negative and dangerous impact to communities and overall water quality. Untreated sewage and rainwater runoff contains pollutants and pathogens harmful to humans and wildlife that rely on the region's river system. Water backups in homes cause extensive damage and require costly cleanups.



The proposed project includes on-site stormwater management (e.g. Silva Cells) to reduce the amount of rainwater runoff that is routed to the combined sewer system (see Figure 6.2.4). By containing and treating stormwater on-site (bioretention), the combined sewer system is provided relief, making a CSO event less likely. Silva Cells are a best management practice (BMP) for water pollution and leverage soil and trees to improve water quality and reduce local water backups.⁶

⁴ <https://www.climatecentral.org/wgts/UHI/index.html>

⁵ <https://www.epa.gov/heatislands/heat-island-cooling-strategies>

⁶ <https://www.deeproot.com/products/stormwater.html#head>

6.3 QUALITY OF LIFE

Increased transportation options and connections to job centers

The Brickline Greenway: Fairground Park to City Foundry Connector will positively impact several quality of life measures, especially for residents of North St. Louis. As detailed in Section 6.1, the Brickline will improve safety and provide convenient alternate transportation options, including connections to transit and St. Louis's bicycle infrastructure network. The Brickline will also connect residents to job centers at the southern end of the alignment, including the Cortex Innovation Community, the Veterans Affairs (VA) Medical Center, St. Louis University (SLU), and the City Foundry, improving employment opportunities. Brickline Greenway is one of the key priorities identified in the [St. Louis 2030 Jobs Plan](#).

Equitable Access to Open Space

Access to parks improves physical and mental health and can reduce crime rates. The Trust for Public Land found that St. Louis residents in neighborhoods of color have 15% less park space access per person than those living in majority white neighborhoods. The Brickline Greenway will improve equitable access to open space for North St. Louis's residents, 95% of whom are Black (see Figure 6.3.1).

Health & Mortality

The Brickline Greenway will create new ways for residents to be active – walking, biking, gliding, and running – in neighborhoods that currently lack safe and accessible spaces to exercise, enjoy nature, or recreate. Studies show that as the density of public green space increases, resident walking activity increases by 8.6%, and the presence of green space is associated with a 41% increase in engaging in regular light physical activity. Intentional programming, such as GRG's Life Outside Festival, encourages people of all ages and abilities to try new forms of active living and new, healthier modes of transportation.

Most Americans do not get enough exercise and the Center for Disease Control (CDC) says physical inactivity is a major contributor to increasing rates of obesity, diabetes, heart disease, stroke, and other chronic health conditions. The CDC encourages active transportation as a way to regularly exercise and improve health outcomes.

The Brickline Greenway will be a major expansion of the greenway system. The greenway, with the accompanying lane reconfigurations, will encourage more active forms of transportation for students, workers, and recreational users. This project helps people overcome barriers to active transportation, thus diverting motorists away from vehicles to biking and walking. More people choosing to walk and bike leads to healthier residents and healthier communities.

Figure 6.3.1



Identity & Culture

The Brickline Greenway will weave arts and culture throughout the design and programming of the greenway to tell stories rooted in the communities of St. Louis. Throughout design development, GRG worked with community groups such as the Artists of Color Council to identify opportunities to integrate art that resonates with the local history. The project envisions cultural programming that celebrates the people who will use the greenway. For example, St. Louis artist Damon Davis is designing a public art installation along a different portion of the Brickline Greenway to commemorate Mill Creek Valley, a former Black community displaced by urban renewal.

Civic and Community Participation

The Brickline Greenway is committed to working with residents to increase connectivity and advance equitable development. Through listening sessions, digital surveys, pop-up events, neighborhood canvassing, and outreach to businesses and major institutions, GRG connected with 2,000+ St. Louisans before any plans for the greenway existed (see Figure 6.3.2).

Figure 6.3.2



As the greenway opens, residents will continue to guide programming and operations. The Brickline Greenway will be a democratic space providing opportunities for both individuals and institutions to contribute through fundraising, volunteering, and shared ownership - building capacity and leaders, and creating a transparent and inclusive project that boosts civic pride (see Appendix L for Public Engagement Strategy).

6.4 ECONOMIC COMPETITIVENESS

Traffic Reduction Impact

The Brickline Greenway represents an important investment for the local community and will have a significant impact on travel times through the corridor. The alignment of the greenway and the accompanying lane reconfigurations were strategically located along roadways that could accommodate such improvements. Modal diversion estimates indicate a reduction in vehicles, with an increase in bicyclists and pedestrians. Though lane reconfigurations will reduce the number of travel lanes for vehicles, optimized signal timings will ensure the efficient flow of vehicles and generate an 8% reduction in travel times (see Appendix K for traffic assessment).

The neighborhoods surrounding the greenway rely on transit to access work, school, shopping, and services. The proposed project estimates increased transit ridership and users diverted from vehicles because of the enhanced bike/pedestrian design and more accessible transit stops. The greenway will not only provide more transportation choices for those without a vehicle, but will also improve the reliability of the transportation system and reduce automobile dependency.

Equitable Economic Development

Increasingly, cities across the country are recognizing that greenways support alternate mobility options, connect residents to jobs and recreation, and improve neighborhood aesthetics and desirability. These direct outcomes in turn raise the value of nearby residential properties. HR&A Advisors considered 25 peer-reviewed articles that analyze historical real estate premia associated with greenways and similar forms of park and connectivity infrastructure. From this literature review, the team selected three precedents that most closely reflect the conditions of North St. Louis and the design of the Brickline Greenway – the Monon Trail in Indianapolis, IN; the Barton Creek Greenbelt in Austin, TX; and the Atlanta Beltline in

Atlanta, GA. Case study selection criteria included the nature of the greenway (a linear park including transportation access such as bike lanes) and a similar setting (urban, downtown adjacent). Five studies were analyzed, which estimated the average one-time value increase for residential properties within ¼ mile of a greenway to be 15% (see Figure 6.3.3 and Appendix M for the Property Value and Development Analysis).

Using parcel data from the City of St. Louis Assessor’s Office, HR&A found that the total value of the 1,346 residential parcels located within a one-quarter mile radius of the proposed Brickline Greenway alignment is \$855 million¹², based upon the most recent County appraisal. Applying the 15% premium to the appraised value, HR&A estimates that the project will increase property values by \$128 million. This premium will benefit homeowners in the form of wealth creation

and increased revenues for public services.

The greenway will also spur a faster pace of development, filling vacant lots as the neighborhood grows (see Figure 6.3.4 and Appendix Q). For example, the Rose Kennedy Greenway in Boston generated a pace of development premium of 1.4x and the Katy Trail in Dallas led to a premium of 2.1x, compared to baseline levels of development and residential unit delivery in those markets. Similar results were seen in Atlanta following construction of the first phase of the BeltLine, as the entire Old Fourth Ward was transformed by new mixed-use developments. Within a ¼ mile of the Brickline, 40% (1,311) of all lots are vacant and 69% of these (911) are zoned as residential. Over the past five years, North St. Louis has experienced negative baseline residential development growth (-0.26% CAGR). New development will

Figure 6.3.3 Real Estate Market Value Comparison

Greenway	Location	Distance Studied	Premium	Urban Setting	Bike Access
Monon Trail & Other Greenways ⁷	Indianapolis, IN	1/2 mile	3.30%	X	X
Barton Creek Greenbelt ⁸	Austin, TX	1/4 mile	4.40%	X	X
		1/2 mile	2.90%		
Atlanta BeltLine ⁹	Atlanta, GA	1/2 mile	21%	X	X
Atlanta BeltLine ¹⁰	Atlanta, GA	1/4 mile	25%	X	X
Indianapolis Monon Trail ¹¹	Indianapolis, IN	1/2 mile	11%	X	X
Average					
1/2 mile			10%		
1/4 mile			15%		

Market Value	Total	Change in Value	Projected Value with Premium	Total per property
All residential properties	\$855,370,368	\$128,305,555	\$983,675,924	\$302,949
Single Family	\$255,808,632	\$38,371,295	\$294,179,926	\$393,815
Multi Family	\$599,561,737	\$89,934,261	\$689,495,997	\$1,151,078

⁷ Lindsey, G., Payton, S., Man, J., and Ottensmann, J. "Public Choices and Property Values: Evidence from Greenways in Indianapolis." Center for Urban Policy and the Environment, 2003.

⁸ Crompton, J and Nicholls, S. "The Impact of Greenways on Property Values: evidence from Austin, Texas." Journal of Leisure Research, 37(3), 321-341. 2005.

⁹ Immergluck, D. & Balan, T. "An Analysis of Home Price Trends Near the Atlanta Beltline, 2011 to 2015." Georgia Institute of Technology, 2017.

¹⁰ MacPherson, D. "Seeking Equitable Development in a Challenging Affordability Landscape: Examining the Relationship between Housing Prices and the Atlanta BeltLine." MIT, 2018.

¹¹ Lindsey, Greg and Man, Joyce and Payton, Seth and Dickson, Kelly. "Property Values, Recreation Values, and Urban Greenways." Journal of Park and Recreation Administration 2004.

¹² This analysis is based off parcels with residential structures, both occupied and vacant. 40% of parcels within a ¼ mile are vacant. 21 are owned by the City, 38 by the Land Clearance for Redevelopment Authority (LCRA), and 297 by the Land Reutilization Authority (LRA).

boost City revenue and reduce the burden on the Land Clearance for Redevelopment Authority (LCRA) and Land Reutilization Authority (LRA), public entities that currently manage these vacant properties. HR&A did not estimate this increase in the rate of development, because the baseline is negative and the appropriate local or national comparison set is unclear.

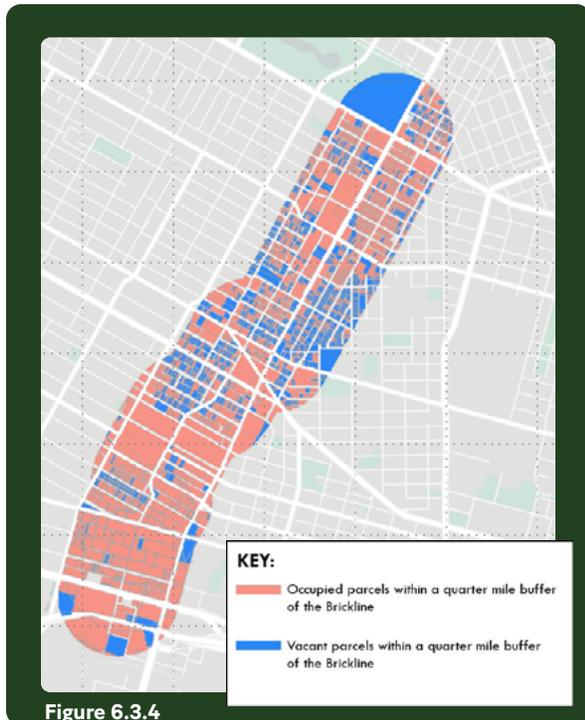


Figure 6.3.4

The project’s construction will create jobs that support the workforce. These jobs will pay prevailing wage, providing quality work with family-sustaining salaries for local neighbors. The project team is committed to hiring Disadvantaged Business Enterprise (DBE) contractors throughout development, beyond the City of St. Louis requirements.

As the neighborhood strengthens as a place of residence, it will attract new businesses and better support existing businesses. GRG is joining with local leaders, business owners, and organizational partners including STL Mainstreet, local community development corporations, the St. Louis Economic Development Partnership, and the St. Louis Community Development Financial Institution Coalition, to leverage public and private investment to support business

growth. The greenway will support existing and new businesses while also removing systemic and bureaucratic barriers to capital and talent that have hurt local entrepreneurs.

In summary, the construction of the Brickline Greenway in North St. Louis represents an opportunity to change the course of the neighborhood — spurring investment, shaping equitable economic development, and increasing access to quality jobs. While the project will improve connectivity across the city, these improvements will be especially important in low-income neighborhoods that lack accessible transit infrastructure. The greenway will connect North St. Louis to clusters of economic growth and opportunity, such as educational resources, employment centers, cultural districts, commercial corridors, and public spaces. Residents seeking employment opportunities will now have a direct, accessible, and sustainable means of transportation to quality jobs. The greenway creates a welcoming and safe place for residents and increases the neighborhood’s attractiveness to prospective residents. Activation will reduce residential vacancies, spur new development, and encourage other public and private investments. These positive impacts will build on each other and help North St. Louis and the City flourish.

6.5 STATE OF GOOD REPAIR

Conditions of transportation infrastructure vary along the project corridor. Pavement conditions were evaluated by the MoDOT pavement condition index (PCI). The MoDOT PCI is an internal evaluation mechanism that scores segments on a scale of 1 to 10. The index is comparable to the Pavement Surface Evaluation and Rating (PASER) system where a score of 1 means the pavement has failed, and a score of 10 means the pavement is in excellent condition. PCI values for Cass Ave were observed in the eastbound and westbound directions in 2019 and 2015, respectively, and for N Grand Blvd in the northbound and southbound directions in 2020 and 2019, respectively. PCI values were not available for segments along N Spring Ave. PCI values for the project corridor range from

4.1 (Fair, severe surface raveling) to 7 (Good, slight or no raveling). Sidewalk conditions also vary throughout the project corridor. In some locations, such as portions along N Grand Blvd, sidewalks are well suited to serve pedestrians. However, in other locations, such as portions along N Spring, sidewalks are overgrown, deteriorated, and unusable. ADA accessibility is generally lacking along the corridor.

Significant portions of the project corridor show signs of aging and require maintenance. The needed maintenance along the corridor varies from routine crack filling or a sealcoat to a thin non-structural overlay or a structural overlay for additional strength. In its current condition, the corridor is limiting motorized and non-motorized personal mobility, freight mobility, and is not aesthetically pleasing. Poor pavement and sidewalk conditions affect travel times, vehicle maintenance costs, and limit commercial activity and economic growth.

Based on averages in the City of St. Louis fiscal year 2020 budget, roadway maintenance costs along the project corridor are currently \$6,147 per year, per mile. The proposed project will reduce annual roadway maintenance costs in two ways. First, modal diversion from vehicles to walking or bicycling will reduce the wear and tear of the roadway. This benefit is expressed as an annual cost savings per user benefit.

Secondly, reducing vehicles lanes on N Grand Blvd from four to three and on Spring Ave from four to two will reduce the total lanes miles of the project corridor. This benefit is expressed as an annual roadway maintenance cost saving benefit.

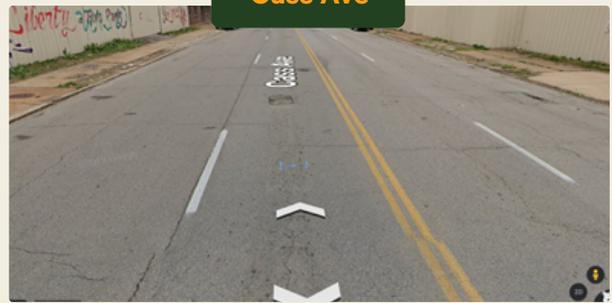
Project improvements including pavement, pavement markings, sidewalks, medians, traffic signals, etc. will ensure this corridor is brought up to and remains in a state of good repair. The anticipated maintenance cost is \$250,000 per mile per year, which is substantially more than the City of St. Louis's budget for roadway maintenance. GRG is committed to operating and maintaining the greenway and, per the MOU with the City of St. Louis (see Appendix I), the City will continue responsibility for traffic lanes and vehicle infrastructure.

GRG is well positioned financially to leverage their own revenue sources, including two independent sales taxes, the GRG Foundation, and receipt of leases, to fund the on-going annual maintenance of the greenway.

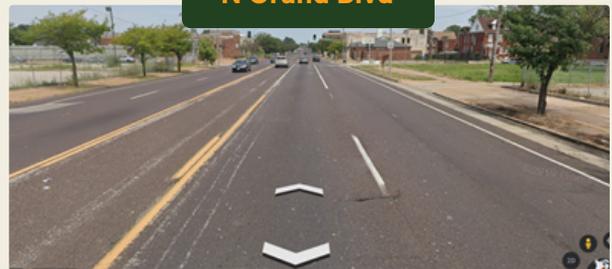
N Spring



Cass Ave



N Grand Blvd



6.6 AGGLOMERATION ECONOMIES

Economic development along the greenway will strengthen relationships among educational, health and cultural institutions, and local employers, fostering opportunities for residents without college degrees, improving access to high-quality jobs, encouraging entrepreneurship,

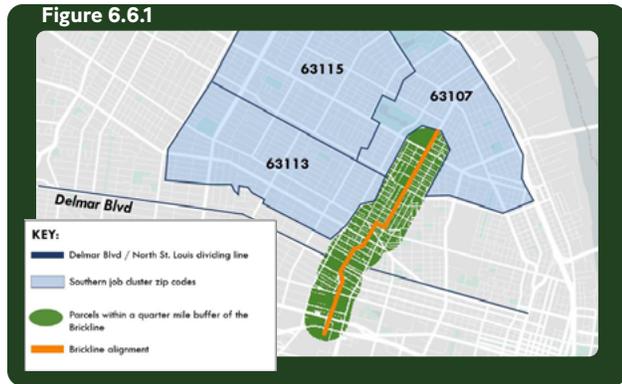
and preparing residents for jobs in growing industries. The southern end of the alignment is a jobs hub, including major St. Louis employers such as the Cortex Innovation Community, the Veterans Affairs (VA) Medical Center, St. Louis University (SLU), and the City Foundry.

GREAT RIVERS GREENWAY HAS BEEN BRINGING GREENWAYS TO LIFE AND MANAGING PORTIONS OF THE SYSTEM FOR 20 YEARS

and has extensive experience in constructing and maintaining high quality greenways. The greenway system includes 128 miles and requires partnerships with over 100 municipalities and institutions throughout the St. Louis region. GRG has an annual operating budget of \$25.5m, generating annual sales tax revenues of \$20.5m. In addition to steady sales tax revenues, GRG enjoys support from the Great Rivers Greenway Foundation, formed in 2016, which has raised \$12.7m through 2020 to fund GRG projects. GRG has a strong credit rating, including an A+ rating from S&P, which was reconfirmed in June 2021.

NORTH — SOUTH — EAST — WEST — NORTH

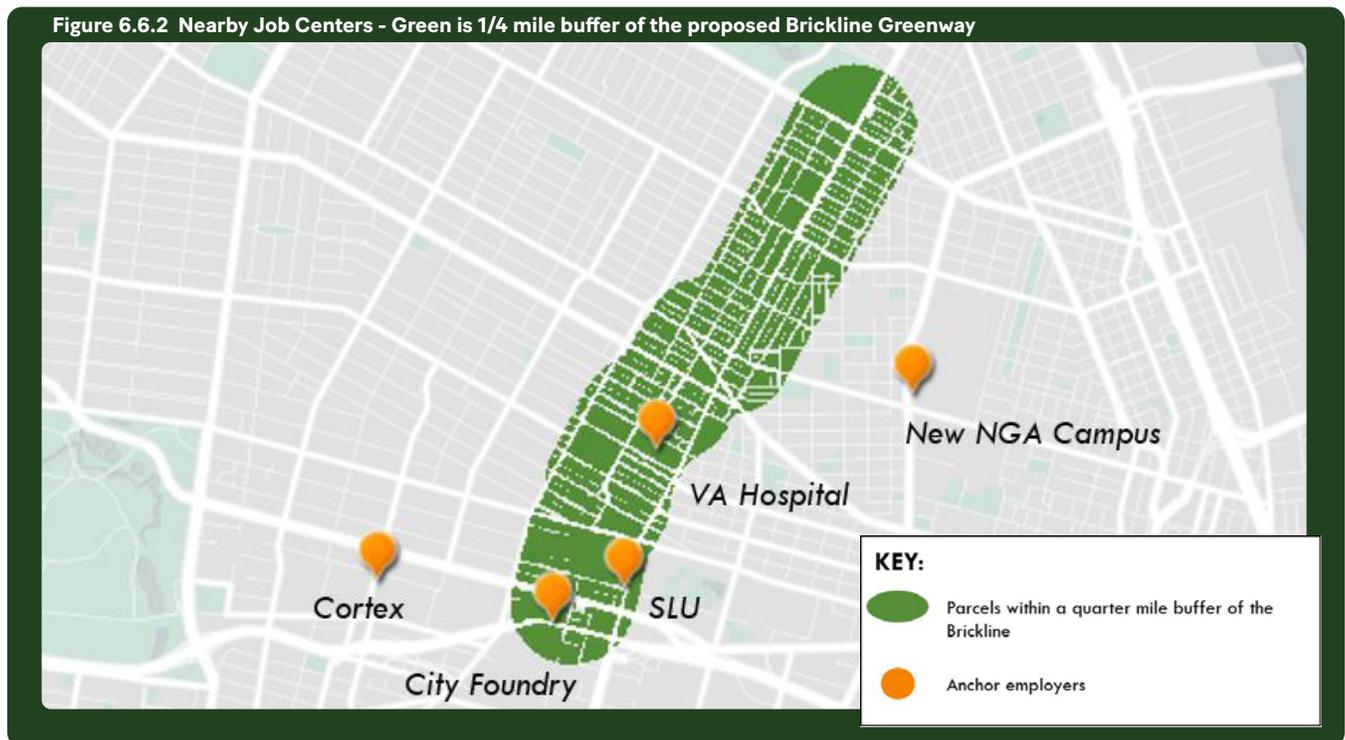
Jobs in the two zip codes that intersect the southern part of the alignment pay an average wage of \$55,000, in line with the city average and more than 20% higher than the average wage for jobs located in North St. Louis (see Figure 6.6.1). Sixty-four percent of these jobs do not require a four-year college degree, making them a realistic option for the 88% of North St. Louis residents without a college degree.



The National Geospatial-Intelligence Agency (NGA) is one of St. Louis’s most important providers of quality jobs. The NGA currently employs 3,700 workers in the region with an average salary close to \$75,000; for the 85% of those jobs located within the City of

St. Louis, the average salary is \$101,000. A new \$1.7 billion NGA headquarters campus is being built in North St. Louis a few blocks east of this segment along the Brickline Greenway, and it has already made significant commitments to supporting the North St. Louis community, including establishing an entrepreneurial program for Black technology professionals, investing and deploying smart city technology in the neighborhood, which will support local businesses and provide additional job opportunities, and investing in local job training and job creation. The greenway will make it easier for local residents to connect to these job and training opportunities.

The project will also connect North St. Louis to the city’s tech hub, Cortex, an innovation district, startup incubator, and coworking space that is a major anchor in the innovation economy. It hosts community-focused networking events that bring local entrepreneurs, students and major employers together, and networking events for women and minorities working in technology sectors. These events help to connect individuals with employment and small businesses with investment (see Figure 6.6.2).



The Brickline Greenway will also improve connections with the City Foundry. This retail and food hall is poised to become a regional destination for locals and visitors alike. The Foundry creates job opportunities at the shops and restaurants, most of which do not require a college degree, and houses tech office space on the upper level of the building.

The project will connect to local educational institutions including SLU. Today, SLU offers job training programs and career services. The greenway connection will create opportunities for education, training, and employment for North St. Louis residents and make living in these neighborhoods more attractive for SLU faculty and students, once there is a direct path for commuting.

6.7 INNOVATION & TECHNOLOGY

Infrastructure

Most traffic signals along the alignment are aged and will be upgraded with the project. The upgrade will include installing fiber interconnect between the signals and Intelligent Transportation Systems (ITS) hardware following City of St. Louis standards. This Intelligent Transportation System infrastructure will connect these signals to the City's Transportation Management Center and the City may run coordinated timing plans to improve traffic flow along the corridor. The two intersections along the corridor that are owned and maintained by the Missouri Department of Transportation (MoDOT) are already upgraded but will be optimized and adjusted for the project using MoDOT standards.

The project design will include requirements to include recycled materials in the pavement materials as part of the roadway resurfacing.

Innovative approaches to stormwater management will also be employed for the greenway. The project will improve the stormwater management system and reduce run-off by using permeable pavers and a new bioretention system, such as Silva Cells or similar. With the incorporation of street trees, green infrastructure, and a bioretention system, localized flooding is reduced and water quality is improved. In addition to the bioretention system, the project will aim to use landscaping that is low-water usage and low-maintenance.

With Bi-State Development's project to include electric charging stations along N Grand Blvd for their electric bus project, the project will seek to inquire with Bi-State to see if an opportunity exists for bicycle parking near these charging stations for e-bikes or micromobility (scooter) charging.

Project Delivery

The project has a substantial amount of private sector funding from project partners and stakeholders, and is considered a Public-Private Partnership. Also, knowing that the overall 20-mile Brickline Greenway may be untenable to build all at once, the overall complex project was divided into more manageable pieces. This allows GRG to have more targeted fundraising efforts so project partners and stakeholders know their investment directly ties to constructing the portions that most affect them.

Similar to past Federal grants overseen by the Applicant, GRG will institute local hiring provisions and utilize Federal prevailing wages when letting the project (see Appendix J).

Lastly, there will be a coordinated "Dig Once" policy. GRG will coordinate with planned utility upgrades and other projects such as Bi-State's project to ensure that the investment will last and not be marred by routine maintenance.



7. BENEFIT-COST ANALYSIS

A benefit-cost analysis (BCA) estimates the future benefits of a project or improvement and compares them to the total costs of the project or improvement. The BCA conducted for this project identifies and quantifies expected benefits, monetizes the benefits using the USDOT Benefit Cost Analysis Guidance 2021 where applicable, or other authoritative source information if necessary, and compares the benefits to the costs, both capital and

maintenance costs, over the expected life of the project (see Appendices A and B).

The RAISE Grant provides GRG an opportunity to leverage local funds and bring immediate benefits to communities of North St. Louis. Figure 7.1 illustrates project benefits and the corresponding RAISE Grant merit criteria. There are numerous anticipated benefits from this project, however not all benefits are quantified and monetized. All relevant project benefits are detailed in this proposal, but benefits are quantified and monetized in the BCA only where possible and appropriate. The BCA provides a data driven approach to measure the benefits of the proposed project.

Figure 7.1

SUMMARY OF PROJECT BENEFITS

RAISE Grant Primary Merit Criteria	Benefits	Quantified	Part of BCA
Safety	Reduces crashes along project corridor	Yes	Yes
	Improves community cohesion	--	--
Environmental Sustainability	Addresses environmental justice communities	--	--
	Addresses climate change	Yes	Yes
	Improves water quality	--	--
	Increases access to open space	--	--
Quality of Life	Reduces mortality and improves health outcomes	Yes	Yes
	Increases transportation choices and equity	--	--
	Addresses racial equity	--	--
	Improves civic participation	--	--
Economic Competitiveness	Improves travel times along the corridor	Yes	Yes
	Increases economic development	Yes	--
State of Good Repair	Reduced operating and maintenance costs	Yes	Yes



Many of the anticipated benefits within this analysis are related to the expected demand or usage of the project improvements and are strictly based on the number of users the project expects to divert from adjacent roadways. The expected users were determined via modal diversion estimation. Modal diversion attempts to estimate the number of users who currently use a specific means of transportation and will be diverted to a different means once the project is completed. The methodologies used to estimate modal diversion follow those outlined in the *Methodology for Assessing the Benefits of Active Transportation Projects*, published for The Trust for Public Land's climate – Smart Cities program.

Figure 7.2 illustrates total project costs and project benefits. The proposed project is expected to generate \$154,984,442 in total benefits (net present value) and has a benefit-cost ratio (BCR) of **4.61**.

A sensitivity analysis was used to account for variability across multiple key assumptions simultaneously. This was done in the fashion of a Monte Carlo simulation, which models the probabilities of different outcomes when random variables are present. In other words, random values are assigned to variables with various levels of uncertainty and averaged over multiple simulation runs to obtain an estimate. The Monte Carlo simulation was run over 1,000 replications, resulting in an average BCR of approximately 4.39 and a standard deviation of approximately 1.27. A confidence interval gives the probability that an estimated interval will contain the true value of the parameter. A 95th percent confidence interval constructed on the population mean and a standard deviation of BCR values generated from the Monte Carlo simulation estimate a lower and upper bound of 4.31 and 4.47, respectively.

Figure 7.2

BENEFIT-COST ANALYSIS SUMMARY

Benefit/Cost	Non-Discounted	Discounted at 7% Annually
	Benefits	
Safety Benefits	\$271,509,672	\$105,599,674
Emission Reduction Benefits	\$40,240	\$21,794
Travel Time Benefits	\$10,479,498	\$4,078,007
Reduced Health and Mortality Benefits	\$12,690,707	\$5,033,150
State of Good Repair Benefits	\$2,166,757	\$852,944
	Summary	
Net-Present-Value (NVP) of Benefits	\$388,170,107	\$154,984,442
Net-Present-Value (NVP) of Costs	\$50,436,076	\$33,625,773
Benefits-Costs-Ratio (BCR)	4.61	

8. RISK REVIEW

Environmental Risk

Evaluation of risks associated with environmental resources, and agency coordination and approvals for the Brickline Greenway, have been considered in detail. Numerous databases and other publicly available data sets were queried to identify potential red flags for key environmental resources that could represent complications for completing the project within the proposed schedule. Special waste, Section 4f, and Section 106 resources were identified as the principal resources with risks associated with the project schedule. Separately, the project is located within a seismic zone.

Special Waste

According to the USEPA Facility Registry Service (FRS), there are numerous hazardous material sites listed within regulatory databases near the project corridor. Of note, the project corridor is immediately adjacent to the site of the former Carter Carburetor Plant, one of St. Louis's most high-profile Superfund sites. A Phase I Environmental Site Assessment will be completed during the preliminary design phase, coordinating with MoDOT to determine appropriate management plans and job specific provisions for these sites. Although there will be properties along the corridor which have recognized environmental conditions, none of these conditions are anticipated to significantly impact the project schedule or costs. This project will remain primarily on existing City property and road right-of-way, with generally shallow excavation required.

Section 4f

The Brickline Greenway is located along a corridor with numerous community and public use sites which make the greenway an attractive feature to link these spaces. Sites such as Fairground Park, Herbert Hoover Boys and Girls Club, The Nancy Lammers Community Garden, Contemporary Art



Museum of St. Louis, and Pulitzer Foundation for the Arts reside along the route. While the community will benefit from the linkage of the greenway, these resources will need to be individually evaluated to determine if they qualify as a Section 4f resource, and if so, if any impacts will be considered a 4f 'Use'. Section 4f of the DOT Act of 1966 created special protection for certain public properties and historic sites. Section 4f is only applicable to projects supported with Federal DOT funds, which this granting source will include. Because this project is a multimodal trail which serves the function of providing recreational benefits, it will be afforded certain discretions. As the project progresses forward and the construction footprint is determined with greater detail, each property will be evaluated to determine if a potential 4f Use occurs. It is anticipated any potential 4f Use will be eligible for a *de minimis* finding or eligible for a Programmatic Evaluation.

Section 106

Section 4f contains protection for some historic properties; however, the National Historic Preservation Act of 1966 separately provides protection for historic properties and is applicable to any Federal action (not restricted to DOT funds). The project corridor contains numerous historic properties and is associated with three historic districts. Five of the structures adjacent to the greenway are listed on the National Register of

Historic Places (NRHP). A Historic Property Assessment Report will be prepared for the above-ground historic resources within this corridor and consultation with the State Historic Preservation Officer (SHPO) will occur. The City of St. Louis has a Cultural Resource Office (CRO) dedicated to the preservation of the unique historic resources of St. Louis. The greenway design will be completed such that it embodies the future of the city while maintaining the connection to its past. SHPO and the CRO will be included very early in the preliminary design phase to discuss design elements near sensitive historic resources. The process to coordinate with the CRO, MoDOT, and SHPO are included with the project schedule. It is expected there will be extensive consultation with SHPO, but this consultation is not anticipated to create a risk for completing the project.

Seismic

The St. Louis area faces earthquake hazards from distant large earthquakes along the New Madrid and Wabash Valley seismic zones. Low attenuation of seismic energy across the region and a substantial number of older unreinforced brick and stone buildings makes the St. Louis area vulnerable to moderate earthquakes at relatively long distances. The proposed greenway project possesses relatively little risk from earthquakes.

Environmental Risks Summary

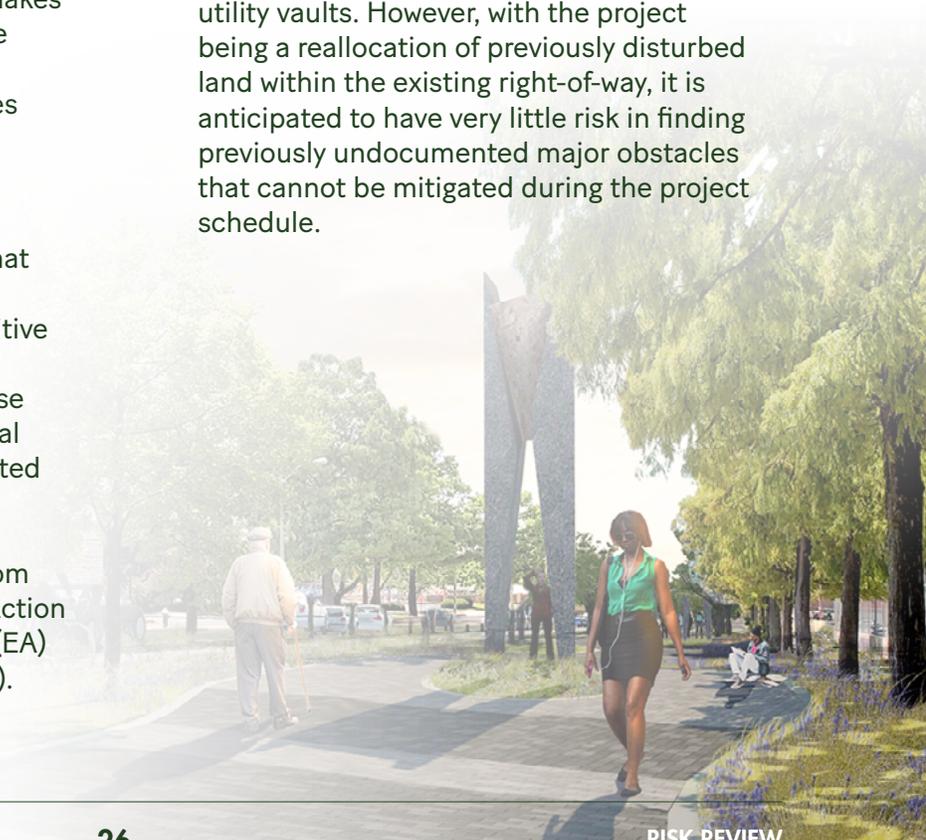
No environmental risks were identified that would be likely to generate a significant environmental impact or result in prohibitive costs associated with mitigation or remediation. The preliminary design phase will include formal National Environmental Policy Act (NEPA) approvals and is expected to be received in 12-18 months. With appropriate management, the project is expected to be categorically excluded from NEPA and not be elevated to a Class of Action as either an Environmental Assessment (EA) or Environmental Impact Statement (EIS).

Financial Risks

GRG has a 21-year history of planning, designing, and constructing multi-million dollar greenway projects throughout the St. Louis region. They have administered more than 15 grants totaling \$30.8 million in Federal funding over the years, including being a major partner in the execution of CityArchRiver. The CityArchRiver project was a past TIGER Grant recipient. GRG was one of six major partners on the project and the steward of the taxpayers' investment. 158 contracts on that project went to local firms, representing almost 90% of the total value of all contracts. To ensure good stewardship, GRG enlisted the help of an outside firm to monitor and report Disadvantaged Business Enterprise (DBE) participation. For the Mississippi Greenway under the Gateway Arch, DBEs received just under 50% of all contracts. For Kiener Plaza, DBE participation included 36% of contracts.

Other Risks

There is subsurface utility risk on all projects. The project will undergo typical locating of utilities and will design for any expected conflicts, including known underground utility vaults. However, with the project being a reallocation of previously disturbed land within the existing right-of-way, it is anticipated to have very little risk in finding previously undocumented major obstacles that cannot be mitigated during the project schedule.



9. PARTNERSHIPS/ STAKEHOLDERS

As shown in the Project History section, GRG has already engaged with numerous partners and stakeholders to this point with the overall Brickline Greenway 20-mile network. For this project specifically, GRG has received more than 40 letters of support (see Appendix C) and two letters of financial commitment totaling \$4.5 million (see Appendix H). The community and area partners have a great desire to move this project forward. In addition to the local sales tax dollars that fund GRG, key financial partners include:

- Corporate: Edward Jones
- Individual: Emily Rauh Pulitzer

Public Engagement

Community engagement remains central to the project's success. The Brickline Greenway North Community Advisory Committee is a group of residents and community members that are working together to ensure neighbor participation in the planning and

design of the North segment of the Brickline Greenway project. Membership includes a selected group of neighbors from the seven neighborhoods within a half-mile radius of the proposed northern alignment of the Brickline Greenway project.



In addition, engagement and planning for this project is being done in collaboration with other major projects including the [Major League Soccer stadium](#), the [Tower Grove Connector](#), [National Geospatial-Intelligence Agency](#), and [Project Connect](#).



10. PROJECT READINESS

This proposal demonstrates the technical and financial feasibility of the proposed project. The Framework Plan detailed the Brickline Greenway conceptual plan and demonstrated high levels of public engagement and support. Design renderings and cross-sections have been completed, cost opinions have been documented, and a consultant has been hired to conduct the NEPA review. Local match funding is available now and the project can proceed at once, upon the award of the RAISE Grant.

Project Schedule

The project schedule, as detailed in Figure 10.1, demonstrates the project will meet all Federal deadlines including the obligation deadline of June 30, 2024, and complete construction by September 20, 2029. The design will begin immediately in 2021 with right-of-way plans complete and approved NEPA document by mid-2023. Final bid set plans would be approved no later than June 30, 2024, with project letting by September 30, 2024. Construction will begin in 2024 and is anticipated to complete in 2026.

Figure 10.1

PROJECT SCHEDULE

Project Activity	2021				2022				2023				2024				2025				2026			
	Q1	Q2	Q3	Q4																				
Preliminary Plans Approved																								
Environmental Documents																								
R-O-W Plans																								
R-O-W Plans Approved																								
R-O-W Acquisition Starts																								
R-O-W Acquired																								
Final Plans Approved																								
Project Letting																								
Contractor Notice to Proceed (NTP)																								
Construction Complete																								

Figure 10.2

DETAILED OPINION OF PROBABLE COST

Project Description/Activities	Total Cost	RAISE Amount	%	Non-Federal Amount	%
Construction Survey & Testing	\$ 141,672	\$ 109,407	77%	\$ 32,265	23%
Site Preparation & Demolition	\$ 1,044,242	\$ 806,424	77%	\$ 237,818	23%
Earthwork	\$ 1,590,497	\$ 1,228,274	77%	\$ 362,223	23%
Erosion Control	\$ 160,801	\$ 124,180	77%	\$ 36,621	23%
Pavement	\$ 292,199	\$ 225,653	77%	\$ 66,546	23%
Hardscape	\$ 4,805,150	\$ 3,710,815	77%	\$ 1,094,335	23%
Landscaping	\$ 7,027,565	\$ 5,427,093	77%	\$ 1,600,472	23%
Utilities	\$ 4,719,081	\$ 3,644,348	77%	\$ 1,074,733	23%
Site Amenities	\$ 146,787	\$ 113,358	77%	\$ 33,430	23%
Intersections & Pavement Markings	\$ 2,603,086	\$ 2,010,254	77%	\$ 592,832	23%
Pavement	\$ 1,398,190	\$ 1,079,763	77%	\$ 318,427	23%
Miscellaneous*	\$ 8,054,861	\$ 6,220,431	77%	\$ 1,834,430	23%
Construction Total	\$ 31,984,130	\$ 24,700,000	77%	\$ 7,284,130	23%
Project Contingency (10%)	\$ 3,198,413	\$ -	0%	\$ 3,198,413	100%
Design & Construction Inspection (12.4%)	\$ 3,966,032	\$ -	0%	\$ 3,966,032	100%
Project Total Costs	\$ 39,148,576	\$ 24,700,000	63%	\$ 14,448,576	37%

*Miscellaneous to include General Conditions, Project Escalation, Mobilization & Traffic Control, Permits, Builders Risk Insurance, Payment & Performance Bond, Overhead & Profit, and DBE/MBE/WBE Participation Tracking

Project Costs

The total cost of the project including construction, project contingency, design and inspection is estimated at \$39,148,576 (see Appendix G). In order to estimate construction cost, the study area was segmented into eight sections based on existing cross sections and right-of-way widths. Each segment has various sub tasks with an expected quantity per unit cost for each category. Then, project escalation, mobilization and traffic control, permits, builders risk insurance, payment and performance bond, and overhead and profit are accounted for in order to estimate the

total per segment cost. The total cost for each sub task (for all segments), project contingency, and design and inspection cost are shown in Table 10.2. Federal funding will be exclusively applied to construction costs.

NEPA Readiness

Documentation and approval of NEPA is a primary driver of project schedules. GRG understands the importance of early coordination with resource agencies and the public, and careful consideration of how the project will impact the community it will serve. The project has been in the conceptual planning stage and with funding is ready to

immediately enter the preliminary design and NEPA stage. Due diligence has been conducted to identify any red flags and the resources that will require the most focus.

This project is intended to be a community asset and it is critical the public be afforded the opportunity to inform the project team about the elements most important to them. Robust public engagement programs will continue to be incorporated into the project schedule. Concurrently, early (and often) coordination with resource agencies is planned. Historic resources, public parks, and special waste have been identified as the key environmental components for the project. The project area also contains Environmental Justice (EJ) populations; however, this project corridor has been targeted specifically to serve these communities by providing enhanced pedestrian mobility and promoting community cohesion.

The project is anticipated to be eligible for processing as a categorical exclusion (CE) through MoDOT. The due diligence review effort has identified the key areas of environmental sensitivity and with careful management should not be at risk for elevation to a class of action documentation of an EA or EIS.

Required State Approvals

GRG will work closely with MoDOT for all design, right-of-way, environmental, and construction approvals. MoDOT will administer the Federal funds of the RAISE Grant through its local public agency program. GRG will follow all state and Federal requirements for approvals granted by MoDOT. GRG will ensure the project is in compliance with NEPA requirements, submit preliminary and final design plans and ROW plans to MoDOT, and will work with any local utility that may be impacted by the project. MoDOT will coordinate project approvals and funding reimbursements between GRG and FHWA.

Required Local Approvals

GRG has earned the full support of the East-West Gateway Council of Governments (EWGCOG) for this proposal and the larger Brickline Greenway network. By supporting neighborhoods and communities, providing transportation choices, and protecting air quality and environmental assets, the project is consistent with the goals of the St. Louis region's long range transportation plan. The current EWGCOG transportation improvement program (TIP) does not include the Brickline Greenway. However, upon receipt of RAISE Grant funding, the proposed project will be included in an amended TIP. A letter from EWGCOG stating their support for the project and intent and commitment to amend the TIP upon a successful grant award is included in Appendix O. During design, the project will also be subject to approval by the Metropolitan St. Louis Sewer District (MSD). The City of St. Louis has been and will continue to be an integral partner every step of the way; staff from multiple departments have been serving on or chairing committees and approval processes to ensure collaboration and long-term success.

THE BRICKLINE GREENWAY IS READY TO MAKE A HUGE IMPACT

in the lives of thousands of St. Louis residents. A very strong public-private partnership is ready to bring this project to life so people can get to work and school on streets that work for them. This greenway is more than a path; it will cultivate neighborhood pride and bring people together. This project will give people a safe and dynamic experience, create critical connections and enhance the environment and economy in an equitable way. **LET'S REIMAGINE WHAT A GREENWAY CAN DO.**



Project of



Great Rivers Greenway