ENVISIONING THE DUGWAY GREENWAY:

Engaging & Connecting Neighborhoods through Stream Restoration



CAPSTONE STUDIOS MAY 2023

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ACKNOWLEDGEMENTS

This report presents Capstone Studios' analysis and recommendations for daylighting one section of the Dugway Brook. The culmination of a semester-long planning project, the report was commissioned by the Chagrin River Watershed Partners and the Cleveland Foundation. The clients requested an initial feasibility study based on community engagement in both Bratenahl and Glenville. The first phase focused on researching the existing conditions and administering

Levin College of Public Affairs and Education

Dean Roland Anglin Steve Antol Kristen Blazek Sharon Bliss Dr. Thomas Hilde Mr. James Kastelic Dr. Wendy Kellogg Robert Martel Shakkia Scott

Bluestone Conservation Roy Larick

Chagrin River Watershed Partners Kaylee Acres Laura Bonnell Heather Elmer

City of Cleveland Jim McKnight Jay Rauschenbach

Cleveland Foundation Stephen Love Zaija Pelligree

Cleveland Metroparks Kelly Coffman Josiah Denson Sean McDermott Cleveland Neighborhood Progress Andrew Sargeant

Cleveland Public Library, Glenville Branch Peter Roth

Cleveland State University Duplicating Patrick Hughes

Cleveland Ward 10 Councilman Anthony Hairston

Cobalt Group, Inc. Patty Choby

Cuyahoga Soil & Water Conservation District Jared Bartley Kairsten Nitsch

Doan Brook Partnership Victoria Mills

Famicos Erica Burnett Royce Muskeyvalley Ava Schmidt

Food Strong Ursula McVey a community survey. The second phase developed an implementation framework based on landscape design concepts, community development recommendations, and reinvestment opportunities.

This plan was developed in partnership with the Levin College of Public Affairs and Education with support from our clients, guest speakers, project partners, advisory committees, and the communities of Glenville and Bratenahl.

> Lake Erie Commission Lynn Garrity

Northeast Ohio Regional Sewer District Michael Blair Dave Ritter Francisco Rivera

Saint Martin de Porres High School Aja Barrett

Village of Bratenahl Mayor John Licastro

Western Reserve Land Conservancy Isaac Robb Matt Zone

Ohio Department of Natural Resources Steve Holland

EXECUTIVE SUMMARY

The Dugway Brook is one of many bluestone streams throughout the Lake Erie watershed in Northeast Ohio. But unlike the bigger escarpment ravines such as Euclid Creek and Big Creek, the Dugway Brook is virtually unknown and unnoticed in the landscape. Most of the brook was buried in a culvert as urban sprawl spread in the 20th century. Today, approximately 95% of the Dugway Brook remains culverted.

Dugway Brook has western and eastern branches that both originate in University Heights and diverge through Cleveland Heights and East Cleveland, respectively, before merging in the City of Cleveland's Glenville neighborhood and spilling out of the culvert in Bratenahl while meandering its way to Lake Erie. This project examines daylighting, or removing the culvert from, one section of the eastern branch of Dugway Brook located inside Glenview Park in Glenville. Daylighting this section will help restore the natural habitat in Bratenahl and naturally reintroduce the stream in Glenville.

To help determine initial feasibility, the Chagrin River Watershed Partners (CRWP) and the Cleveland Foundation approached Capstone Studios from Cleveland State University's Levin College of Public Affairs and Education.

Capstone Studios evaluated the potential daylighting benefits from both an environmental and community development perspective. Daylighting the stream will lead to positive environmental impacts by improving water quality and providing stormwater flood mitigation. At the same time, daylighting the stream can help unlock the potential of the dormant greenspace throughout the Dugway Brook corridor. Capstone Studios imagines this daylighting project as the first step in building the Dugway Greenway, an integrated regional trail sprouted around the eastern branch of the Dugway Brook. The Dugway Greenway can be a transformative community asset, one that increases community development, expands regional connectivity, and invites reinvestment opportunities in the adjacent neighborhoods.

While creating the Dugway Greenway is the long-term goal, this daylighting project would immediately change the face of Glenview Park and the immediate neighborhoods. Such a change should not occur without community involvement, so Capstone Studios conducted a community-wide survey to gauge preferences and expectations in both Bratenahl and Glenville. With over one hundred received responses, the survey revealed community interest in restoring the stream and provided data on suggested amenities needed in both Glenview Park and the surrounding community.

Based on survey results and planning best practices, Capstone Studios developed an implementation framework designed around contributing to community development, engaging the community, increasing neighborhood and regional connectivity, balancing environmental and social needs, and generating reinvestment opportunities. Embracing the recommendations from this framework will help improve the natural and built environments in both Bratenahl and Glenville and, to a greater degree, take the first step in envisioning the Dugway Greenway.

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INTRODUCTION

CHAPTER 1

PROJECT PURPOSE

Envisioning the Dugway Greenway: Engaging & Connecting Neighborhoods through Stream Restoration was designed to examine the impacts, opportunities, and benefits of daylighting a section of the long-buried Dugway Brook, on the City of Cleveland's east side, and in the process, restore an already open segment of Dugway Brook within the Village of Bratenahl.

This project is part of a larger project called "Engaging Dugway Brook Communities in Designing Stream and Wetland Restoration" that is focused on assessing flood risk reduction benefits, conducting cost-benefit analyses, and engaging stakeholders in decision-making to implement all or a portion of nature-based solutions with a goal of restoring up to 4,600 linear feet of Dugway Brook and its estuary, and restoring 1.5 acres of coastal wetlands and 9 acres of riparian buffer within the City of Cleveland and the Village of Bratenahl.

Envisioning the Dugway Greenway also serves as a catalyst for exploring how restoring Dugway Brook can enhance outdoor public greenspace, create community connections, and support the well-being of the Glenville community. This project serves as the foundation for a larger, transformative initiative in the City of Cleveland's Glenville neighborhood.

Lake Erie Coastline, Bratenahl

Dugway Brook, Cleveland Heights

Glenview Park, Glenville

PROJECT LOCATION

The primary area of study for this project includes Glenville's Glenview Park and the area immediately surrounding it. The project area extends approximately from St. Clair Avenue in the south to the Lake Erie coast in the north, and E. 102nd Street in the west to E. 126th St. in the east. Several key analyses of the project look beyond this at a larger area of the Glenville neighborhood and at regional connections to other Cleveland neighborhoods and East Cleveland. Within the Village of Bratenahl, the project focused on the Dugway Brook Estuary, north of Lakeshore Boulevard.



MISSION

To establish the feasibility of daylighting Dugway Brook in the Glenville Neighborhood and improve the ecological health of the stream, while maximizing opportunities for community development and creating connections across the natural and built environments.

VISION

Daylighting Dugway Brook will be a catalyst for renewed ecological health and neighborhood development. Improving stream health and enriching the Lake Erie coastal zone will be balanced with providing social and economic benefits to the surrounding communities.

Planning for the daylighting project will incorporate working with local residents and stakeholders to develop ways of improving environmental and social connections within the Glenville neighborhood and the Village of Bratenahl.



PROJECT GOALS

Add a community asset to the neighborhood that contributes to overall community development.

development. support c Engage the community Objective

to identify preferences on the natural and built environment.

Explore the connectivity of the Dugway Greenway.

4

Balance the stream's health and hydrologic requirements with the social needs of the community. **Objective 1:** Incorporate recommendations from prior community master plans.

Objective 2: Add safe and well-maintained natural areas and recreational facilities in Glenview Park. **Objective 3:** Grow community partnerships that support community programming and events.

Objective 1: Expand educational programming that highlights the benefits of a stream restoration project. **Objective 2:** Collaborate with community organizations and local educational institutions.

Objective 3: Develop community engagement plans and outreach programs that target underserved populations and long-term residents.

Objective 1: Create linkages to nearby existing trails, greenspace, Lake Erie, and other community assets. **Objective 2:** Identify potential trail connections from Glenview Park to regional assets, such as Forest Hill Park and the Cleveland Lakefront Nature Preserve.

Objective 1: Improve Dugway Brook's upstream conditions to improve the overall water quality and volume.

Objective 2: Improve green infrastructure for flood and stormwater mitigation.

Objective 3: Address the wrongs from past urban development and begin an environmental justice conversation by involving residents in the decision-making process.



Generate reinvestment opportunities within the surrounding neighborhoods of Glenview Park. **Objective 1:** Invite redevelopment of abandoned and underutilized parcels.

Objective 2: Improve housing stock in adjacent neighborhoods through renovations and new construction.

Objective 3: Explore the opportunities to develop small businesses along St. Clair Ave and E 105th St. near the park space improvements.

EXISTING CONDITIONS

CHAPTER 2

HISTORY

Glenville was established on November 6, 1872, and was incorporated as a village on October 4, 1870. William J. Gordon was the first mayor, and there was a population of 500 making it a booming village for the time. Figure 1 shows an image of Glenville at that time.

Wealthy Industrialists began moving to the northern end of Glenville along the lake. They were buying large plots of land and were building large, beautiful summer homes along the lake. As downtown Cleveland continued to decay many of these wealthy industrialists started to reside in their summer homes yearround. In doing this, many were moving from millionaires' row on Euclid Avenue. In 1904 this area seceded from Glenville and the Village of Bratenahl was formed, creating a class divide between Glenville and Bratenahl.

Glenville became a village in 1870, then Bratenahl seceded to become its own village. In 1905, Glenville was formally annexed to Cleveland. In the 1930s and before, the Glenville area had a primarily Jewish population, however, in the 1950s this Jewish population moved to the suburbs. In the 1950s and 1960s, Glenville became mostly African American, and to this day the Glenville community is still predominately African American. When Bratenahl seceded to be its own village it created a class divide between Glenville and Bratenahl and in the 1950s and 1960s, this class divide evolved into a racial divide as the population of Glenville changed. This change occurred as the historically Jewish population moved out to the suburbs and the African American population moved into Glenville. This divide is compounded by the physical divide between this area and the construction of the Memorial Shoreway.

Dugway Brook is a historic bluestone stream and was formed around 14,000 years ago. This



Figure 1: An image depicting the early settling in the Glenville/ Bratenahl area. Source: Glenville- Bratenahl Historical Society- BRATENAHL, Ohio. Bratenahl Historical Society.

was during a late glacial period, the Wisconsin Glaciation. There is an east and west branch of the stream, and this glacial movement is what formed the two different branches of the stream, as seen in Figure 2. We are exploring daylighting the east branch of the stream. The majority of Dugway Brook is underground and 95% of Dugway Brook is culverted. It has been culverted since the early 20th century and only 300 feet of Dugway Brook is visible above ground. Dugway Brook's west branch has several open channels and one of the largest runs through Lakeview Cemetery. In 1977, a dam was built in Lakeview Cemetery on Dugway Brook. When the dam was constructed, it was the largest dam east of the Mississippi. The dam works to support the west branch of Dugway with storm water disbursement.

Forest Hill Parkway Elementary was located in the middle of the area that is now Glenview Park. It was a part of the Cleveland Municipal School District. The school closed in 2011 and the school was torn down shortly after closing to make room for Glenview Park. There was a lot of open space surrounding the school, as seen in Figure 3. This is why it was easy to redevelop the area into a park.

There are several Landmark Districts in our study area. A Landmark District is any area designated by the Landmark Commission as one containing and having physical improvements of historical, social, cultural, architectural, or aesthetic significance to the city or state. There are three Landmark Districts near our study area; they are Grantwood Allotments, Magnolia-wade Park, and East Boulevard. There are also several Local Landmarks in our study area. Several of these Local Landmarks are local churches. Along East 105th street and St. Clair there is an entire row of churches that are Local Landmarks. Additionally, some schools and a post office have been designated as Local Landmarks. There are no buildings on the National Register of Historic Places within our study area.



Figure 2: The East and West branches of Dugway Brook Source: Dugway brook, Case Western Reserve University Encyclopedia of Cleveland History.



Figure 3: Greenspace surrounding Forest Hill Parkway Elementary Source: "Forest Hill Parkway Elementary School" by C. Busta-Peck, Flickr.

DEMOGRAPHICS

The following demographics and maps capture the gradual patterns of change that our study area has experienced.

Population

Our study area is comprised of nine Census Tracts within Bratenahl and Glenville. In 2021, the population of Glenville was 14,670 and the population of Bratenahl was 1,418.

Figure 4 depicts the population change that took place between 2010 and 2021. It is very clear that it has been fluctuating initially for both Glenville and Bratenahl. For Bratenahl there was a positive change seen from 2014 to 2017. And it suddenly decreased in the year 2019. For Glenville, it also has experienced ups and downs until 2019 and saw a significant increase in population from 2019 to 2021. The reason behind this steep increase occurring after 2019 for both Bratenahl and Glenville is that during the Covid 19 Pandemic and after, many people have migrated from one place to another due to their jobs, employment opportunities and other reasons.

Race and Ethnicity

Shown in Figure 5, 98% of people in Glenville are Black or African American and 77% of people in Bratenahl are White American.



Figure 4: Glenville and Bratenahl Population Change

Source: Calculations based on data from U.S. Census Bureau (2010-2021)



Figure 5: Glenville and Bratenahl Race & Ethnicity Source: Calculations based on data from U.S. Census Bureau (2021)

Education Attainment

Figure 6 shows the education attainment of people residing in Glenville and Bratenahl. There are more High school graduates in Glenville (48%) than compared to Bratenahl(11%) and there are more individuals with Graduate and Professional degrees in Bratenahl (41%) than compared to Glenville(5%). Moreover, the number of people with a Bachelor's degree is higher in Bratenahl compared to Glenville. Therefore, we can say that Bratenahl as an area has a higher educational attainment compared to Glenville.



Figure 6: Education Attainment in Percentage

Source: Calculations based on data from U.S. Census Bureau (2021)

Employment Rates

It can be clearly seen in Figure 7 that the Labor Force Participation Rate (LFPR) of Bratenahl (60%) is higher than that of Glenville (average 20%). There may be a correlation between educational attainment and employment rates. In Bratenahl, a higher percentage of the population has attained an education beyond high school and the unemployment rate is only 1.4%, whereas the unemployment rate of Glenville is much higher than the Bratenahl.

Census Tract	LFPR	Unemployment Rate
CT 1114.01	54.6	19.1
CT 1163	47.7	20.7
CT 1164	57.7	27.1
CT 1165	49.8	20.2
CT 1166	42.7	19.8
CT 1167	62.8	24.2
CT 1168	48.2	15.4
CT 1992	56.8	11.4
Bratenahl	60	1.4

Figure 7: Labor Force Participation and Unemployment Rates Source: Calculations based on data from U.S. Census Bureau (2021)

Housing Occupancy & Vacancy

Numerous studies have shown that homeowners, renters, and prospective buyers demand more green infrastructure projects, especially in urban areas like Glenview Park. Daylighting Dugway could lead to increased property values and lower vacancy. It can be seen in Figures 8 and 9 that the percent of vacant houses is higher in Glenville and the percent of occupied houses is higher in Bratenahl, even though it has fewer housing units compared to Glenville. Moreover, Figure 9 also shows that there are more owner-occupied housing units in Bratenahl. And there is more renter-occupied housing units in Glenville.



Figure 8: Percentage of Occupied vs. Vacant Housing Source: Calculations based on data from U.S. Census Bureau (2021)



Figure 9: Percentage of Owner-Occupied vs. Renter-Occupied Housing

Source: Calculations based on data from U.S. Census Bureau (2021)



Figure 10: Percentage of Occupied Housing Unites Source: Calculations based on data from U.S. Census Bureau (2021)



Figure 11: Percentage of Vacant Housing Units Source: Calculations based on data from U.S. Census Bureau (2021)

Crime Rate

Police reports from census tracts surrounding the study area around Glenview Park were compiled and show that the crime rate is significantly higher than the rest of Cleveland.



Figure 12: Crime Rate Source: NEOCANDO

· 44108

Median Home Sales

Home sales in the 44108 zip code were significantly less compared to other zip codes in the city. Sale prices for the area also include Bratenahl as well. While there are less units in Bratenahl the higher sale prices for the Village impacted the overall sales price for the area as a whole.



Figure 13: Median Home Sale Prices Source: MLS Data generated by Phillip Studmire

COMMUNITY RESOURCES

Access to city services, education, healthcare, and places to gather and connect, create the foundation of any community. A sufficient number of community resources can help a community thrive, while a shortage of resources can limit a neighborhood's health and welfare. Within Bratenahl and Glenville, the availability of community resources creates both strengths and weaknesses. The following provides an analysis of the existing community resources in these communities, and a full inventory of Community Resources is available in Appendix A.

Recreation & Education Facilities

Within our study area there are two recreation facilities and eight parks, as illustrated in Figure 14. These facilities include the Cleveland Cory Recreation Center, Glenville James Hubbard Recreation Center, Bratenahl Dog Park, Cleveland Lakefront Nature Preserve, Flora Park, Forest Hills Park, Glenview Park, Martin Luther King Jr. Park, the Rockefeller Park Greenhouse & Botanical Garden, and Sam Miller Park.

Amenities at the Cory Recreation Center include a gym, indoor pool, game room, computer room, weight room, sauna, racquet ball courts, an art room, and a boxing rink. Programming at Cory Recreation Center includes a chess club, a video games club, dodge ball, and boxer fitness. Glenville Recreation Center is home to a gym, indoor pool, sauna, boxing rink, and game, computer, meeting, weight, and art rooms. The Glenville Recreation Center also has a rubberized playground, two full-sized basketball courts, and one ballfield. The facility offers a variety of programming including, but not limited to swimming classes, arts and crafts,



Figure 14: Educational Facilities, Libraries and Parks & Recreation Facilities Data Source: Google Maps. Mapped by Anna Mates.

a basketball league for children ages 8-17, and an assortment of programs for senior citizens. The Glenville Recreation center also provides neighborhood resources and programming such as a teen center, a meal program, and college information and preparation sessions.

Park amenities throughout the study areas include a rubberized playground at Flora Park, a rubberized playground and parking lot at Sam Miller Park, and a rubberized playground and multi-purpose field at Martin Luther King Jr. Park. Forest Hills Park has basketball courts, a playground, a multi-purpose field, and baseball diamond. In the heart of Glenville, Glenview Park features exercise equipment stations, a loop trail, a shelter, an aquatics playground, a rubberized playground, a multi-purpose field, basketball courts, and a parking lot. As shown in Figure 15, the majority of our study area is within a 10-minute walk service area from the community parks discussed, indicated in light green. The far eastern side of Glenville and the northeast region of Bratenahl, in purple, are outside of the 10-minute walk service area and are considered moderate and high priority areas for new parks, according to the Trust for Public Land's ParkServe mapping service (Trust for Public Land, n.d.).

Glenville is within the Cleveland Metropolitan School District (CMSD) and five CMSD schools serve children from Pre-Kindergarten throughout High School. These include Franklin D. Roosevelt Elementary School, Michael R. White Elementary School, Stephanie Tubbs Jones Elementary School, Stonebrook Montessori at Michael R. White Elementary School, and Glenville High School. The Brightside Academy Ohio-St. Clair serves children ages 0-12 and provides programming that includes infant day care, preschool, and after school programs. Additionally, the Breakthrough Public Schools, a free public charter school, has both an elementary and middle school in the Glenville neighborhood. Their Citizens Academy Glenville serves children in Kindergarten – 4th grade, while the Citizens Leadership Academy Glenville serves students in grades 5-8. Of the four CMSD elementary schools in the neighborhood, three participate in the Safe Routes to School program, which facilitates projects and programs to both encourage and enable elementary school age children in grades K-8 to walk or bike to school (Cleveland City Planning Commission, n.d.). Franklin D. Roosevelt, Michael R. White, and Stephanie Tubbs Jones Schools take part in the program and route maps for each school are available through the Cleveland City Planning Commission and Cleveland Metropolitan School District.

Figure 16 shows the 10-minute walk service area to schools within our study area, and while most of the Glenville neighborhood is within this service area, there is a portion of the neighborhood north of St. Clair Avenue that is outside the service area. Likewise, the entirety of Bratenahl is outside of this 10-minute walk service area.



Figure 15: 10-minute Walk Service Area to Parks Source: ParkServe, The Trust for Public Land



Figure 16: 10-minute Walk Service Area to Schools Source: ParkServe, The Trust for Public Land



Figure 17: 1/2-Mile Buffer Around Library Data Source: Google Maps. Mapped by Anna Mates.

The Bratenahl Elementary School opened in February of 1907 and the Bratenahl High School opened in September of 1975, however, on June 30, 1981, these schools closed and the Village has been served by the Cleveland Metropolitan School District since that time (Bratenahl Historical Society, 2019).

The Glenville Branch of the Cleveland Public Library is located within the study area, on St. Clair Avenue near the eastern side of Glenville. As Figure 17 shows, the ½-mile buffer around the library, indicated in yellow, does not reach western Glenville or the southern portion of the study area, and does not extend into Bratenahl. While this indicates most residents live outside a ½-mile walkshed, or 10-minute walk, from the library, the library can be easily accessed by alternative transportation such as a bus, bike, or car.

The Glenville library provides access to "free wifi and public computers with internet access," while "printing, copying, scanning, and faxing services are available for a fee" (Cleveland Public Library, 2023). Other services offered by the library include events, classes, workshops, and art exhibits. The library also serves as a hub for community gathering and information sharing, as library staff partner with other organizations, schools, and churches within the neighborhood, and the library provides communication between residents of Ward 9 and their Councilman (Cleveland Public Library, 2023).

Civic Spaces, Religious Organizations & Salons and Barbershops

While Glenville is a neighborhood within the City of Cleveland, Bratenahl became a Village in 1904 and as such, Bratenahl has its own Village Hall, Historical Society, and Community Center. In contrast, there are no City of Cleveland or Cuyahoga County facilities within the Glenville neighborhood. Bratenahl Village Hall is home to the Mayor's Office, the Mayor's Court, and the Fiscal, Building, Parks and Recreation, Police, and Service Departments. The Bratenahl Community Center includes several recreational facilities, a community garden, meeting rooms, picnic areas, a playground, and other amenities for residents to use.

Within our study area there is one Police Station in the Village of Bratenahl and one Fire Station on St. Clair Avenue in Glenville. The nearest City of Cleveland Police Department is located in nearby South-Collinwood, approximately 10 minutes from Glenville by car.

Religious organizations can be the foundation of a community and there are twentynine churches in Glenville. Many of these congregations are Baptist, but other Christian denominations are also represented in the neighborhood. In addition to providing a space for residents to gather and worship, churches engage with and support the community through a variety of services and events. The St. Aloysius-St. Agatha Parish, for example, has been supporting Glenville residents by distributing food throughout the neighborhood for over 100 years. Their Hunger Center distributes bags of food once a month and they have a hot meal program every Tuesday. Similarly, the Everlasting Missionary Baptist Church runs many Boards and Ministries where residents of any age can become involved with the Church and the community. These include, but are not limited to choirs, boards, a chorus, and dance teams.

Salons and barbershops play an important role in communities, and especially within Black communities. They are not only a place where community members can have their hair cut and styled, or their nails done, but a place where residents can gather, create bonds, and strengthen their community connections. The styling of Black hair can often be collaborative and involve multiple people working on one style, and "while the care, manipulation, and styling of Black hair has evolved throughout history, there are communal strands that carry through" these experiences (Ellington, Underwood & Rogers, p. 51). In the late nineteenth century, Black barbers began "establishing the barbershops and salons as gathering places in their neighborhoods" (Ellington, Underwood & Rogers, p. 51). Within the Glenville neighborhood, there are thirteen barbershops and salons serving the community and carrying on a long tradition of creating a communal space for residents to gather and connect while receiving hair and nail services from fellow members of their community. In nearby Bratenahl, there is one nail salon located within the Bratenahl Place Condominiums and the salon is open to the public.

Access to Health Care & Food

In Glenville there are two Healthcare Facilities affiliated with MetroHealth, one primary care clinic and one pharmacy. The Murtis Taylor Human Services System has a location on East 105th Street and provides specialized healthcare with a focus on "behavioral health, addiction, and youth, family, and senior services" (Murtis Taylor Human Services System, 2023). Project H.O.P.E. is another specialized organization that has been providing healthcare services to area residents since 1993. They bridge gaps for residents who may not have access to healthcare and are able to provide a variety of services including various screenings, immunizations, and health education.

As illustrated in Figure 18, much of our study area is categorized as a food desert by the U.S. Department of Agriculture, which is defined as a Census Tract in which 33%, or more, of the population live more than one-half mile from a supermarket. Supermarkets in the area include three larger grocery stores and three smaller markets including Family Dollar and Dollar General. In addition to offering a full selection of grocery items, the New Eastside Market partnered with Neon Health to bring a state-of-



Figure 18: Food Desert Designations Source: U.S. Department of Agriculture, Food Access Research Atlas

the-art kitchen to the east side communities. To provide nearby residents with food and nutrition education, the facility provides healthy cooking classes and creates conversations and community around healthy eating. In an effort to supplement the availability of fresh produce and other grocery items within the community, five churches operate food distribution centers and the Greater Cleveland Food Bank partners with these and additional organizations to provide hot meals, pantries, and a mobile pantry service.

The Famicos Foundation, a Community Development Corporation, serves Glenville and provides a range of social services to residents. Within their scope of services, the Famicos Foundation has several initiatives in place to support the health and wellness of the Glenville community. These include Pop-up Vaccine Clinics at low-income senior apartment buildings, the Glenville Heritage 5K Run & Walk through the historic Glenville neighborhood, the Cleveland Clinic 8-Week Challenge, bicycle programs, and food distribution.

The Cleveland Clinic 8-Week Challenge allows Glenville residents to compete with other residents of Glenville, and nearby neighborhoods, by participating in and attending fitness classes, nutrition classes, or other wellness classes. When residents participate, they accumulate points for their community and at the end of the 8-week challenge, points are tallied to determine a winner. This initiative is a collaboration between the Cleveland Clinic, Famicos Foundation, and other community partners to promote community health and wellness and is offered three times throughout the year (Famicos Foundation, n.d.-a).

By partnering with Bike Cleveland, Famicos administers bicycle programs that create opportunities for the community to gather, get exercise, reduce their carbon footprint, and participate in rides throughout the Glenville neighborhood. Other initiatives include a "Bike Fixathon" and the distribution of helmets and lights to residents (Famicos Foundation, n.d.-a).

Additionally, Famicos Foundation works with the Greater Cleveland Food Bank to distribute food throughout the community. They also offer nutrition classes and healthy cooking demonstrations several times throughout the year in conjunction with the Cleveland Clinic 8-Week Challenge and Gateway 105 Market. Famicos Foundation also established a farmer's market called the Gateway 105 Farmer's Market. This Market "brings in vendors to sell fresh, locally grown produce, herbs, jams and jellies, and other fresh goodies" (Famicos Foundation, n.d.-a). The Gateway 105 Farmer's Market not only provides the community with fresh, healthy foods, it also offers "holistic healthy workshops, sustainability workshops, mobile health screenings, cooking demonstrations, exercise classes, and other health and wellness programs" (Famicos Foundation, n.d.-a).

Walkability & Transportation

Access to transportation and the walkability of a neighborhood are important for a community's overall health and their ability to access necessary services and jobs in a timely manner. Within our study area, Bratenahl has low intersection density while Glenville has medium and high intersection density, as indicated in Figure 19. This indicates there are more roads and a higher number of intersections in Glenville which can be an asset when walking and biking, as routes are more direct. According to the National Walkability Index, most of our study area is considered above average walkable while several small pockets are categorized as most walkable and also below average walkable, as seen in Figure 20.



Figure 19: Intersection Density Source: U.S. Environmental Protection Agency, National

Walkability Index



Figure 20: Walkability Index

Source: U.S. Environmental Protection Agency, National Walkability Index

As illustrated in Figure 21, there are households that do not own a car and therefore rely on the availability of public transit. The majority of our study area is within a quarter mile from transit stops while several small pockets are between a quarter and half mile of transit stops. The primary source of public transit available to residents is bus service provided by the Greater Cleveland RTA. Figure 22 shows the bus stops for five different routes that run through Bratenahl and Glenville. It also notes the two closest light rail stations, Superior and Stokes-Windermere Stations. All of our study area is outside of the half-mile buffer around each of these stations and while residents of Glenville can reach them by walking or cycling, they are not as accessible as the available bus routes.



Figure 21: Zero Car Households

Source: U.S. Environmental Protection Agency, Smart Location Database



Figure 22: Bus and Light Rail Stations Data Source: Google Maps. Mapped by Anna Mates.

LAND USE, ZONING & PRIOR PLANS

Land Use

In Bratenahl, the proximate land use around the project study area is residential and preserved open space. The residential uses are primarily single-family residential, with the exception of Bratenahl Place along the eastern mouth of Dugway Brook. Bratenahl Place comprises 180 residential units across two 16-story highrise condominiums on 18 acres. All the land is privately held except for one parcel, a large tract of land along the western riparian buffer that is village-owned and actively managed by the Western Reserve Land Conservancy, who assigned a conservation easement that prohibits any intensive use and restricts development in perpetuity. The easement, however, does permit recreational activities such as walking trails, cross-country skiing, and snow shoeing.

In Glenville, the surrounding land use around the project study area is residential with commercial usage on the southern boundary along St. Clair Avenue. Industrial uses are confined to areas along the Interstate-90 corridor. Unlike Bratenahl, there are hundreds of publicly controlled parcels around the site area, mainly owned by the city land bank or the county land bank. These parcels present the opportunity to assemble land for development opportunities, such as infill single-family housing on small lots and commercial retail on lots with frontage on St. Clair Avenue. Land assembly can also help forge new connections to the park throughout the surrounding residential neighborhoods, specifically on the western portion.



Figure 23: Publicly Owned Land Source: Cuyahoga County Fiscal Office



Figure 24: Current Land Use by Parcel Source: Cuyahoga County Fiscal Office

Zoning

In Bratenahl, the project study area and most of the surrounding area is zoned as singlefamily residential. The districts are R-1 and R-2, with the main difference minimum lot sizes of 30,000sq. ft and 15,000sq. ft, respectively. The parcels containing Bratenahl Place do not have a zoning designation in the publicly available zoning data.

In Glenville, the city of Cleveland has more specialized zoning districts. The project study area is zoned for residential development, with the northern portion allowing for high-density multi-family development in a MF3 district.

The surrounding neighborhoods are zoned for low-density residential, with some multifamily scattered throughout. Frontage along St. Claire Avenue is in a Local Retail Business ("LR") district, with more clustered development confined to a General Retail Business ("GR") district at the intersection of St. Clair Avenue and East 110th Street.

Prior Plans

Bratenahl

In Bratenahl's 2013 Master Plan, one of the stated goals is to promote conservation efforts throughout the village to improve the quality of life of the residents and to protect property values.

The plan specifically brings attention to protecting and restoring the natural riparian buffers around Nine Mill Creek and Dugway Brook. Moreover, the plan cites concern for Dugway Brook's upstream conditions and the potential repercussions of mismanagement and aging infrastructure on the water quality and volume of the brook.

Pursuing these objectives will help stabilize the stream bank, re-vegetate the riparian

zones, and eradicate invasive species. While clear in the objectives, the plan identifies no specific implementations except for the need to formulate public-private partnerships for the most cost-effective measures.

Regional parties also have plans for the open section of Dugway Brook. Chagrin River Watershed Partners recently released their 2021-2026 Strategic Plan for the Central Lake Erie Basin Collaborative. The plan specifically identifies restoring 2,000 linear feet of Dugway Brook from the culvert exit at Lakeshore Boulevard to Lake Erie. The plan calls for removing artificial structures, reestablishing meanders, and rebuilding the estuary marsh habitat. These objectives will aim to restore the Dugway Brook back to a more natural state.

Glenville

In 2017, the City of Cleveland completed a Master Plan for the Glenville neighborhood. The plan determined the neighborhood needed to increase housing diversity, strengthen education, expand employment, improve community wellness and promote environmental stewardship.

The plan does not specifically identify Glenview Park, however, it does emphasize the need for wellness programs and recreational services.

More broadly, the city is in the midst of completing a city-wide comprehensive park plan and has expressed interest in creating a regional connection to Forest Hills Park. The Trust for Public Land also picked Cleveland, along with five other cities, to participate in their "10-Minute Walk Park Equity Accelerator", a planning initiative to expand park access in underserved communities.





Figure 25: Current Zoning by Parcel Source: Cuyahoga County Fiscal Office

ENVIRONMENTAL CONDITIONS

Daylighting streams is the process of exposing buried or channelized streams by removing structures such as pipes, culverts, and concrete slabs, allowing them to flow naturally. This process has numerous environmental benefits including restoring water quality, enhancing natural flood mitigation, soil restoration, increasing biodiversity and habitat rehabilitation, as well as creating new greenspace assets for the community (Trice, 2013).

Stream culverting comes with it many environmental drawbacks that could be rectified through daylighting and restoration (Sinclair, 2012). These environmental considerations include:

- Decreased water quality
- Increased flooding and pollution runoff
- Loss of habitat for vertebrates and invertebrates alike
- Soil erosion and instability
- Loss of community benefits and greenspace access

Water Quality

When streams are channeled underground or covered with concrete, they are deprived of sunlight, air, and natural vegetation, which are essential for maintaining healthy water quality (Beaulieu et al., 2014). Daylighting these streams allows sunlight to penetrate the water, which promotes the growth of aquatic plants and algae. These plants and algae then produce oxygen, which improves the water quality and creates a healthier aquatic ecosystem (Pennino et al., 2014).

Additionally, when streams are channelized, pollutants such as sediment, bacteria, and



Figure 26: U.S. EPA Map of Cuyahoga River Area of Concern (Star is Study Area) Source: Ohio Lake Erie Commission

chemicals can accumulate and negatively affect water quality. When streams are daylighted, the natural flow of water helps to flush out pollutants, improving the overall water quality for residents and wildlife alike who depend on the aquatic ecosystem of living.

Flood Mitigation

Culverting can increase the risk of flooding during heavy rain events (Wild et al., 2011). The underground channels may not be able to handle the increased water flow, leading to flooding in the surrounding area. This increased flooding is especially important for areas like Glenville and Bratenahl that frequently face issues caused by aging and failing storm water infrastructure and combined sewer overflows. Additionally, daylighting can help to prevent flash flooding by allowing rainwater to be absorbed more easily into the ground. When streams are culverted, rainwater can collect and accumulate, increasing the risk of flash flooding during heavy rain events. Daylighting streams can help to prevent this by allowing rainwater to flow into the ground and into the stream, reducing the risk of flash flooding.

Glenville, Ohio, like many areas across the United States, can be prone to flooding, especially during periods of heavy rain or rapid snowmelt. The causes of flooding can vary, but some common factors include inadequate drainage systems, poor land use practices, and natural phenomena such as flash flooding.

In recent years, Glenville has experienced several instances of flooding that have caused damage to homes, businesses, and infrastructure (Northeast Ohio Regional Sewer District, 2018). The city has taken steps to mitigate flooding, such as improving drainage systems and updating floodplain maps to better inform development decisions. However, the prevalence of impervious surfaces throughout the community continues to hinder progress.

Impervious surfaces, such as concrete, asphalt, and buildings, are surfaces that do not allow water to penetrate the ground. These surfaces cover urban areas and can significantly affect the natural water cycle, including the occurrence and severity of floods. When rain falls on impervious surfaces, it cannot be absorbed into the ground, so it runs off into storm drains and surface water bodies, such as streams and rivers. As the number of impervious surfaces in an area increase, the amount of runoff also increases, resulting in more frequent and severe flooding events.

Looking at the study area, the percent imperviousness of the Dugway and Nine Mile

Creek sub watershed, which contains the study area, is 42.2. This number indicates that 42.2% of the subwatershed where Dugway Brook is located is covered by impervious surface. This presents a significant problem for stormwater management and increases the likelihood of stormwater runoff directly into the lake, which will bring about secondary effects of excess nutrients and pollution deposit into Lake Erie. Opening up Dugway Brook would help to minimize the stormwater runoff into the lake by decreasing the impervious surfaces in the area and slow the flow of water into the already overburdened stormwater infrastructure.

Soil Restoration

Daylighting streams and soil restoration are closely connected, as both can help to improve the health of the ecosystem and provide a range of benefits for the surrounding community (Smith, 2007).

Soil restoration is the process of improving the health of soil that has been damaged by erosion, overuse, or other factors. Healthy soil is essential for a healthy ecosystem, as it supports the growth of vegetation, provides habitat for a range of organisms, and helps to regulate water and nutrient cycles.

Daylighting streams can help to improve soil health by reducing erosion and sedimentation, which can harm soil structure and reduce soil fertility. When streams are allowed to flow freely, they can help to stabilize the soil and prevent erosion, which can help to improve soil health and promote the growth of vegetation.

Similarly, soil restoration can help to improve the health of streams and the surrounding ecosystem. When soil is healthy, it can absorb and filter water more effectively, which can help to prevent runoff and improve the quality of the water in streams and other bodies of water. Healthy soil can also provide habitat for a range of organisms, which can help to promote biodiversity and improve the overall health of the ecosystem.

Soil restoration is especially important for an area like Glenville that has been plagued by soil contamination through historical manufacturing practices. Based on commercial and industrial practices from past and present land uses in the study area, potential soil contamination may include lead, petroleum and fuel waste from manufacturing and power generation, polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs) resulting from industrial power burning, volatile organic compounds (VOCs), and many other environmentally and physically hazards

substances (U.S. EPA, 2019).

Habitat Restoration

Daylighting also improves the physical habitat of the stream. When streams are covered, the water temperature can become warmer due to the lack of shade, which can be detrimental to aquatic life. Daylighting allows trees and other vegetation to grow along the banks of the stream, providing shade that helps regulate water temperature. These plants also help stabilize the banks, reducing erosion and sedimentation, which can harm aquatic life.

The area in which Dugway brook is located is an important stopover for migratory birds traveling along the Mississippi Flyway (The Nature Conservancy, 2022). This important bird migration route stretches from the Gulf of Mexico to Canada, with millions of birds



Figure 27: Urban Stream Daylighting Example in Philadelphia Source: Army Corp of Engineers

passing through the region each year. The city of Cleveland is home to several important migratory bird habitats, including parks, nature reserves, and natural areas, which provide critical resting and feeding spots for birds on their long journey.

However, the health of migratory bird populations in Cleveland and beyond is threatened by a variety of factors, including habitat loss, climate change, and pollution. Efforts are underway to protect and preserve important bird habitats in Cleveland and throughout the region, including through the creation of bird-friendly gardens and the restoration of important wetland habitats. The restoration of Dugway Brook would be an important step in this preservation of bird migratory habitat.

Concurrent to the effort to preserve and protect migratory bird habitat in Cuyahoga County, projects are underway to address threats to fish populations in Lake Erie and its tributaries. Lake Erie fish species are vital to the health of the lake's ecosystem, and their diversity is critical to maintaining a balanced and thriving environment. Stream daylighting in Glenview Park can help alleviate environmental stressors on native fish populations and improve biodiversity to the north of Glenville (Neale & Moffett, 2016).

Green Space Access

In additional to the direct environmental benefits of stream restoration such as water quality improvement and soil retention, stream daylighting can help to improve greenspace access by creating new opportunities for community engagement and outdoor recreation (Dinnie et al., 2013). When streams are culverted or channeled underground, they can be inaccessible to the public and can create barriers to greenspace access. Daylighting streams can help to remove these barriers by providing natural pathways for community members to engage with the surrounding greenspace.

When streams are daylighted, they can create new pathways for walking, hiking, and biking. The natural setting of a daylighted stream can provide a beautiful and inviting environment for outdoor activities, which can encourage more people to engage with the surrounding nature. Daylighting a stream can also help to enhance connectivity between different areas of greenspace. By providing natural pathways, daylighting can help to connect parks, trails, and other greenspaces, which can make it easier for community members to access and enjoy these areas.

Interlinked greenspaces, or green networks, can bring numerous benefits to the environment and communities (Forest Research, 2023). Interlinked greenspaces can bring numerous benefits, including improved biodiversity, air and water quality, climate change mitigation, recreational opportunities, economic benefits, and community benefits. By connecting fragmented habitats and promoting the health of natural systems, interlinked greenspaces can help support healthy and sustainable communities for generations to come (Derr & Lance, 2012). This interlinking goal could be realized by daylighting Dugway Brook along the Glenville corridor and connecting other adjacent parks.

Estuary Restoration

Estuary restoration can bring numerous benefits to both the environment and the communities that depend on them. Estuaries are important for filtering pollutants and improving water quality (Jickells et al., 2014). Restoration efforts such as planting native vegetation, constructing wetlands, and removing invasive species can help improve water quality by filtering out pollutants and reducing nutrient loading. Estuaries provide critical habitat for a variety of species, including fish, shellfish, and birds. Restoring estuaries can provide critical habitat for these species, as well as other wildlife. Climate change adaptation: Estuaries can help mitigate the impacts of climate change by reducing the risk of coastal flooding and storm surge. Restoring estuaries can help protect coastal communities from the impacts of climate change by providing natural buffers that can absorb and dissipate storm surge and waves.

Environmental Justice

Stream restoration can involve environmental justice by addressing and correcting historical inequities and ensuring that all communities have access to clean and healthy waterways in areas considered urban stream deserts (Napieralski et al., 2015). Environmental justice is the fair and equitable treatment of all people regarding the development, implementation, and enforcement of environmental laws, regulations, and policies (Moran, 2010).

Many communities have been historically disadvantaged and have disproportionately withstood the worst of environmental pollution and degradation (Hillman, 2004). Daylighting can help to correct these historical inequities by improving water quality and providing new opportunities for community engagement and recreation. Stream restoration projects can promote public participation and ensure that community members have a voice in the restoration process. This can help to ensure that all community members, including those who have been historically disadvantaged, are heard, and can play an active role in shaping the restoration project.

Stream restoration projects can also create community benefits, such as improved water quality, enhanced recreational opportunities, and increased property values. These benefits can help to promote environmental justice by ensuring that all communities have access to clean and healthy waterways and the associated benefits. It is important to ensure that the benefits of stream restoration are distributed equitably among all communities. This can involve targeted outreach to historically disadvantaged communities, ensuring that restoration projects are accessible and affordable to all, and monitoring the project to ensure that benefits are being distributed fairly (Smardon et al., 2018).

Impervious Surfaces

The impervious surface map indicates that there is a high percentage of imperviousness, shown in red and purple, in the area surrounding Glenview Park. High percentages of imperviousness contribute to problems like flooding, stormwater runoff, stormwater pollution, poor water quality, and sewage overflows (NRDC, 2022). Glenview Park itself has a low percentage of imperviousness, shown in gray and pink. However, improvements to permeability can still be made through the introduction of trees and native plants to landscaped grass areas and through the use of permeable pavement in place of impervious materials like asphalt or concrete (NRDC, 2022).

Tree Canopy

Urban tree canopy is defined as the "layer of leaves, branches, and stems of trees that cover the ground when viewed from above" (Center for Watershed Protection, 2015). The urban tree canopy plays an important role in stormwater management, particularly within urban areas, by capturing rainfall before it can run off paved surfaces, pick up pollutants, and make its way to local waterways through storm drains (Center for Watershed Protection, 2015).

As illustrated in Figure 29, the tree canopy in Glenview Park is lacking and most of the park


Figure 28: Impervious Surfaces in and around Glenview Park Site Area Source: USGS

is grass/shrub. There is a larger tree canopy in the surrounding residential neighborhoods than in the park. Increasing the tree canopy of the park will have a cooling effect on the surrounding neighborhood, provide stormwater management, and provide shade in the park for recreational activities. There is an opportunity to increase the tree canopy in Glenview Park which will also increase the wildlife in the area.

Furthermore, urban tree canopy aids in reducing the urban heat island effect, lowering the heating and cooling costs for homes, combating air pollution, increasing property values, and improving the quality of life by providing aesthetic and community benefits (Center for Watershed Protection, 2015).



Figure 29: Tree Canopy at Glenview Park & Surrounding Area Source: Cuyahoga County Urban Tree Canopy Viewer

STRENGTHS & WEAKNESSES



Strengths

- Glenville is in close proximity to the Lakefront.
- The area has rich historical character, including Landmarked buildings, historic homes, and Historic Districts.
- The Glenville neighborhood is walkable according to the EPA's National Walkability Index.
- The Lakefront is accessible to Bratenahl residents in some areas.
- Project Partners are dedicated to engaging citizens in the design and development of an organic landscape that is both beautiful and beneficial to the community.
- Funding is secured for the project's feasibility study, which is underway and could help the daylighting project move forward.



Weaknesses

- Accessing the Lakefront by biking or walking is inconvenient for Glenville residents.
- There is limited access to supermarkets and other retail in the Glenville neighborhood.
- There is a lack of economic investment and redevelopment in the Glenville neighborhood.
- There is low transit accessibility in the Glenville neighborhood.
- There is limited public access to the Lakefront for Bratenahl residents in some areas.

OPPORTUNITIES & THREATS





Opportunities

- Dugway could encourage additional economic investment and community redevelopment in the Glenville neighborhood, bringing opportunities for new housing, retail businesses, entertainment, and recreation.
- Dugway provides a unique feature in Glenview Park that could become the inspiration for placemaking in the Glenville neighborhood.
- There is an opportunity to create pedestrian and cyclist connections to the Lakefront as well as other parks and neighborhoods.
- Daylighting Dugway could act as a catalyst for continued restoration of the larger Dugway Brook corridor, looking beyond our immediate study area to upstream areas, including Forest Hills Park.
- Dugway could provide environmental and community benefits to flood mitigation and water quality improvements, including keeping stormwater out of combined sewer systems and reducing water treatment costs.

Threats

- Community members and the community's landscape could be negatively impacted by both short and long-term removal, relocation, and/ or replacement of valuable park and green space amenities.
- Community members could have safety concerns over having open water in Glenview Park.
- Community members could be negatively impacted if community engagement is not conducted appropriately and sufficiently.
- There is a threat to the project if additional funding is not secured to move the project forward.
- There is a threat to the project if the community is not proactive in supporting opportunities for combating climate change and environmental water hazards.

DAYLIGHTING FRAMEWORK

CHAPTER 3

LITERATURE REVIEW

City planners have covered waterways and diverted streams through pipes and culverts over the years. However, covering these rivers, creeks, and waterways led to many environmental and economic issues, including increased pollutants, habitat degradation, and flooding. As environmental awareness grew, so did the awareness of the consequences in terms of ecology, ethics, and morality because of the actions taken by city developers (Khirfan, Mohtat, & Peck, 2020).

The negative effects of global climate change on cities such as floods, heat waves, and drought heightened the need for natural solutions (Khirfan, Mohtat, & Peck, 2020). Daylighting removes these coverings and underground pipes and restores the covered waterways to their natural states by creating an open channel from a piped or buried channel (Neal & Moffett, 2016). In urban areas where there are more buildings and other developments, new channels have been created for water to flow freely. Stream daylighting is a relatively new concept and is an instance of green infrastructure technology (Buchholz et al, 2016). It is also referred to as a radical form of stream restoration (Neal & Moffett, 2016). Even though the idea of green infrastructure had its beginning during the industrial revolution, it took many years to fully define what it entails (VWRRC, 2007). It incorporates manmade systems and the natural environment to conserve the ecosystem in a way to provide benefits to both humans and wildlife. The benefits of daylighting can be many fold, including ecological, economical, educational, and aesthetics. It has been proven that it is possible to improve habitat and water quality by daylighting and at the same time, reduce the effects of flooding by increasing water storage capacity as compared to a culvert (VWRRC, 2007).

Economic Costs & Benefits

Daylighting is a costly, labor-intensive process. However, it has been seen in many places that implementing daylighting is more economically beneficial than replacing or designing new pipes (VWRRC, 2007). It is also more economical to keep removing buried



Figure 30: Before and after the daylighting of Bee Creek, Dubuque, IA Source: American Rivers, Daylighting Report

streams away from combined sewer systems as that prevents stream water from mixing with sewer discharges and ultimately keeps the water flowing to the wastewater treatment plants (American Rivers, n.d). Less water requiring treatment means less sediment removal, and maintenance, resulting in reduced costs (American Rivers, n.d). Open waterways are also easier to maintain and repair than replacing culverts helping municipalities to save money (VWRRC, 2007). Daylighting itself is a one-time cost (American Rivers, n.d). Property values have increased in areas where streams and rivers were brought to life along with attracting new businesses and investments. Properties near waterways tend to be generally higher in value as opposed to non-waterfront properties. Prices are even better in places where there are provisions to maintain clean water and a healthy environment (Citizens for a Better Flathead, 2007). According to research, properties attract and retain economic development in areas where the natural qualities of waterways and their shores are retained (Citizens for a Better Flathead, 2007). Home prices in three different California locations have seen their prices go up by 3-13% because of flood mitigation and clean water (Citizens for a Better Flathead, 2007). Studies done in Baltimore, MD, using the distance band model have found that home prices within 1,000 ft of a restored stream increase by 15%, and those within 2,000 ft increased by 11%, while homes that are more than 3,000 ft away did not see any significant hike in prices (UConn, 2022). These findings can be applied to areas near restored streams in other cities as well.

Areas around daylighted streams can provide neighborhood amenities such as recreation and physical activity (NRC, 2023). The vicinity of buried streams has seen a decline in neighborhood quality with buildings being abandoned like that in Philadelphia and Boston (American Rivers, n.d). On the other hand, there is a potential opportunity for economic and job growth associated with the maintenance of surrounding areas and the construction of new buildings (American Rivers, n.d). Nonprofit groups like Sustainable South Bronx in New York, have been successful in providing aid for infrastructure implementation and maintenance and training students for green-collar jobs (American Rivers, n.d).

Flooding has always been an issue in both urban and suburban areas and most of the time it has been attributed to aging drains and pipes. Sometimes the size of the pipes and drains contributed to this flooding which can no longer handle impervious surfaces. Flood damage can be very costly to repair and, in many cases, the driving force behind stream daylighting has been to mitigate persistent flooding issues. In fact, the reason behind most daylighting projects that are undertaken in urban areas now is to manage stormwater to prevent flooding in the downtown business and residential areas (Buchholz et al, 2016). The economic benefits that flood mitigation can bring have allowed many city governments to push for these kinds of projects. Easing flooding problems has led to many urban revitalizations and redevelopments (VWRRC, 2007). Daylighting increases the area through which water can flow and can increase storage capacity, helping in dealing with peak flows and flow duration and ultimately reducing flooding. Eliminating choke points where waterways were forced into pipes helps reduce localized flooding (NRC, 2023).

One of the examples of using daylighting to mitigate flooding issues is the Arcadia Creek Festival Site, which was undertaken as part of its redevelopment project; of all the areas daylighted, this has been one of the most urbanized locations (VWRRC, 2007). It also involved lots of property acquisitions and



Figure 31: Arcadia Creek, Kalamazoo Michigan Source: American Rivers, Daylighting Report

demolitions in the process. However, the project proved to be successful and helped in flood mitigation which had plagued Kalamazoo for many years (VWRRC, 2007). Financially, the area has benefited tremendously. The park brings in \$12 million annually in terms of concert and festival fees while it took \$7.5 million to create the park, with maintenance fees of around \$50,000 annually (VWRRC, 2007).

Daylighting streams can be very expensive. According to a study from Rocky Mountain Institute, it is estimated that the cost can be \$1,000 per linear foot of the stream (NRC, 2023). There are different sources of funding like Clear Water Act 319 funding, Brownfield programs, FEMA Hazard Mitigation Assistance, and state clean water/drinking, revolving funds, which can provide help. However, maintenance of culverts is an ongoing process and can be expensive while daylighted streams require little to no recurring costs (UNC, 2008).

Ecological Benefit

One of the best examples of the ecological benefits of a daylighted stream is the removal of nutrient pollution (American Rivers, n.d). Small headwater streams play a more significant role in removing these particles as they are more in contact with the stream channels. Fungi, bacteria, algae, and aquatic insects in headwater streams, eat nutrients like inorganic nitrogen and phosphorus and convert them into biologically useful materials (American Rivers, n.d). This consequently reduces the build-up of nitrogen and phosphorus downstream which would otherwise be a catalyst for green algae blooms coupled with areas of low-level oxygen. The dead zones are harmful to fisheries as has been seen in the Gulf of Mexico and the Chesapeake Bay (American Rivers, n.d). Even though nutrient retention is highest in undeveloped headwater streams, studies have shown stream daylighting can improve nutrient uptake and stream metabolism significantly as compared to streams that are buried (American Rivers, n.d).

The passage of fish from one section to another also helps in the movement of nutrients. Fish must be able to spawn, mature, and swim in the water for that to happen. Water in which there is no variation in currents and where there is no light is a barrier to fish passage (Spacing Atlantic, 2014). An example of a successful daylighting project that introduced fish passage to a fishing stream in the Catskills, is the Darbee Brook project in Roscoe, NY (VWRRC, 2007). The project was funded by FEMA and the NY Department of Environmental Conservation and the organization, Trout



Figure 32: Darbee Brook after daylighting Source: Virginia Water Resources Research Center, Daylighting Report



Figure 33: Saw Mill River after daylighting, Yonkers, NY Source: American Rivers, Daylighting Report

Unlimited (VWRRC, 2007). It involved removing the old pipe, replacing it with dirt, and building a new 160 feet long channel for diverting Darbee Brook from the culvert. The cost was \$9,000, much less than \$50,000, which was the estimate for replacing the existing culvert (VWRRC, 2007). Another example is the restoration of Jenkins Creek in Maple Valley, WA. It was targeted at the Soos Creek basin near Seattle. Two sections of the creek were diverted to flow in underground pipes since the 1950s, impacting fish passage and water quality (VWRRC, 2007). Daylighting was implemented in two phases. There were two channels, which were 700 ft and 800 ft long. (VWRRC, 2007). A portion of the existing surface stream was also restored, the floodplain was recreated, and residents in the adjacent areas were taught not to dump debris into the creek or to use fertilizers near the stream. (VWRRC, 2007). Both the Darbee Brook and Jenkins Creek projects were successful in restoring fish passage and ecological functions as it was before they were buried underground.

The ecological health of streams flowing

through an urban area is considerably reduced because of its dominance by species that can tolerate more stress because of pollutants, loss of vegetation, structural modifications, and hydrological impact (Neal & Moffett, 2016). Modifications due to culverting, and burial or diverting streams into pipes are considered severe since the connection between streams and the environment is removed (Neal & Moffett, 2016). A more urban example of the daylighting stream for ecological reasons is the one on Sawmill River in Yonkers, New York. The river flows through Westchester County and into the Hudson River in Yonkers (American Rivers, n.d.). The river was a dumping ground for industrial waste and sewage overflows. Daylighting this river began with a grant of \$2,50,000 from the US EPA in 2020 (American Rivers, n.d.). The project was successful in creating an aquatic habitat of around 13,755 square feet. Vegetation was introduced alongside and within the river to attract insects which were good for the American eel and other fish in the water (American Rivers, n.d.). The area around the river since has become an attractive place

to host outdoor ecological workshops and other forms of entertainment. The project cost around \$19 million and was completed in 2011 (American Rivers, n.d.). However, \$3.1 billion was proposed by developers in terms of new buildings and developments (Spacing Atlantic, 2014). Tax revenue itself from these proposed developments is sufficient to cover the one-time cost of daylighting (Spacing Atlantic, 2014). This project is a good example of how daylighting is good for the environment, economy, and community.

Social Benefit

A good environment is vital to improving the quality of life. When a river is daylighted, it improves the environment and aesthetics surrounding it, attracting people to the area. It provides the needed green space where people can relax, breathe in the fresh air, and use the space for exercise and recreation. Physical activity is essential to a good and healthy lifestyle. Research has shown that restored river areas have become attractive places for both adults and children (ECRR, 2019). The environmental effects on mental well-being are well known. A healthy environment helps in reducing stress. Outdoor activities help in dealing with depression and building well-being (ECRR, 2019). The term "Green Exercise" has been coined in 2003 exactly with this concept in mind, meaning performing physical activity while being exposed to nature (ECRR, 2019).

Activities like fishing, biking and even watching wildlife provide relief from daily stress. River corridor is a cost-effective place for commuting as well and, further aid in destressing (ECRR, 2019). Parks near rivers can provide a place for social bonding. Residents from different communities can interact with each other and a sense of belonging can develop (ECRR, 2019). Daylighting rivers restore the natural landscape around the waterways improving aesthetics (ECRR, 2019). It is a good source for educating children and residents about the environment and wildlife and their impact on human lives.

Education is another one of the social benefits that a daylighted stream has provided. Outdoor classrooms are used in many schools to study different aspects of the environment and its impact on humans (Buchholz Younos, 2007). Daylighting stream projects have been used to foster interest among students in ecology, the ways how waterways work, the life they support, and how the overall ecological systems interact with humans and their needs. An example of a daylighting stream for educational purposes is the Jolly Giant Creek Project in Arcata, CA., which is located on school property and students were active participants in the daylighting project. (VWRRC, 2007). The main purpose of this project was to educate the students about aquatic life (VWRRC, 2007) It has created a green space where people gather for different kinds of activities. Over the years, humans have depended on waterways for transportation, fishing, farming, and recreation, and rivers have always been an inspiration for art, music, and architecture in society. Rivers have always been and always will be an integral part of our culture.



Figure 34: Jolly Giant Creek Project, Arcata, CA Source: Northcoast Journal Weekly

CASE STUDIES

Case Study #1: Acacia Reservation

In 2012, the Cleveland Metroparks acquired the 155-acre site of the former Acacia Country Club in Lyndhurst and set about returning it to a natural state. (Cleveland Metroparks, 2014) As a part of this process, The Cleveland Metroparks daylighted portions of streams flowing into Euclid Creek.

Built in 1923, the golf course's aquatic infrastructure was designed to facilitate its recreational purpose. (James Ewinger, 2016; Cleveland Metroparks, 2014) To rapidly evacuate water to assure the course would be playable, the course featured a network of tile drains and pipes that directed rainwater to its peripheries where it discharged into Euclid Creek and its tributaries. (Cleveland Metroparks, 2014) To increase the course's playable surface streams on the site were culverted. (Cleveland Metroparks, 2014) To ensure plush green surroundings, the site featured an irrigation system that pumped water from man-made ponds through water lines crisscrossing the property. (Cleveland Metroparks, 2014) This infrastructure was then expanded haphazardly over the next century. (Cleveland Metroparks, 2014) This altered the hydrology and ecology of the site, draining the wetlands which had dominated the site and facilitating the displacement of native flora and fauna. (Cleveland Metroparks, 2014)

In 2012, the course was acquired for \$14.75 million by an anonymous donor group acting through the Conservation Fund, a national nonprofit conservation organization. (Cleveland Metroparks, 2014; James Ewinger, 2016) The group attached deed restrictions (covenant) providing that the site could no longer be used for golf, could contain no more than two acres of development, and would be restored to its natural state. (Cleveland Metroparks, 2014; James Ewinger, 2016) To that end, the Cleveland Metroparks partnered with Biohabitats, Inc., a firm specializing in ecological restoration and conservation planning, to generate and implement a plan to naturalize the site.

This process began with the gathering of baseline data on flora, fauna, hydrology, and soil conditions and community outreach in the form of public meetings and other forms of community engagement. Based on these inputs, the Cleveland Metroparks and Biohabitats developed the Acacia Reservation Master Plan. This plan for the new eco-park called for, inter alia, daylighting sections of long-buried streams. (Cleveland Metroparks, 2014; Polletta, 2022) Under the plan, 2650 to 3250 linear feet of two streams were to be daylighted at a cost estimated variously at \$200 to \$400 and \$300 to \$600 per linear foot of stream length; totaling \$530,000-\$1,950,000.



Figure 35: Daylighting Acacia Reservation Source: Cleveland.com

(Cleveland Metroparks, 2014)

In the end, portions of three streams were daylighted. The first stream, flowing from the northeast pond and extending 240 linear feet, was daylighted at a cost of approximately \$225,000; design costs for this project were paid for with a grant of \$25,000 from the OEPA's Great Lakes Restoration Initiative, while construction costs, amounting to approximately \$200,000 were covered by the Conservation Fund. (Grieser, 2016; Sustainable Streams, 2021) The second daylighting project uncovered 200 linear feet of Euclid Creek cost \$216,250, paid for with a grant of \$66,250 from the Conservation Fund and \$150,000 in federal funds provided by the US Fish and Wildlife Service under the Great Lakes Fish and Wildlife Restoration Act. (Lenhart & Smiley 2018; Grieser, 2016) Recently, the Cleveland Metroparks daylighted 150 linear feet of intermittent stream in the southeast corner of the reservation at a cost of \$200,000. (Hoehne & Grieser, 2018) This last daylighting project was specifically disavowed by the plan due to cost. (Cleveland Metroparks, 2014) The total cost of these projects amounted to \$616,250 at an average cost of \$1,044.49 per linear foot of stream length, far above any of the initial estimates.

In addition to these improvements, between 2014 and 2017, the Cleveland Metroparks:

- Offered 164 programs that reached 1,900+ guests
- Led 18 events that engaged 278 volunteers
- Partnered with 20+ organizations & agencies
- Planted 5,782 trees & shrubs
- Installed 1,078 live stakes & 4,174 herbaceous plugs
- Identified 139 species of birds utilizing Acacia
- Restored 1,775 ln. ft. of stream channel
- Created 2,535 In. ft. of headwater swale

- Managed invasive plants across the entire park (155 ac.)
- Visited by 456,757 people (preliminary results) (Grieser, 2018)

As of 2021, the number of native plants and trees installed had climbed to 10,000, 4,300 linear feet of stream had been restored, and more than eight acres of wetland had been created. (Cleveland Metroparks, 2022) The Metroparks also established native meadows, stocked fish, removed invasive species, and performed stream clean-ups as well as ongoing monitoring and maintenance efforts. (Cleveland Metroparks, 2022; Grieser, 2018)

As a result of all of these efforts, the hydrologic health of Euclid creek has improved as the reservation's creeks and streams now act as a natural filter for pollutants while reducing downstream flooding and erosion. (Frolik, 2019) Additionally, the reservation has become a popular destination for parkgoers; in 2021, the park had more than 291,000 visitors – more than three times the popularity it had when it opened. (Cleveland Metroparks, 2022)

Moreover, the creation of new habitat and the elimination of invasive species has improved the reservation's ecology, "result[ing] in a drastic return of native vegetation and wildlife." (Cleveland Metroparks, 2022) A survey conducted in 2013, before restoration, counted 232 plant and animal species in the reservation; as of 2021, that number had risen to 465 species. (Cleveland Metroparks, 2022; Hausman, 2013) Additionally, between 2013 and 2017 the plant species count increased from 130 to 188. (Grieser, IERQC archived webinars: Jennifer Grieser (May 2018) 2018) Finally, while improvements in the health of the Reservation's aquatic ecosystems have exceeded admittedly low expectations, it remains an issue. (Cleveland Metroparks, 2014; Grieser, IERQC archived webinars:

Jennifer Grieser (May 2018) 2018) However, the bulk of these weaknesses are attributable to downstream barriers to fish movement and the remainder may resolve on their own over time. One survey examining the ecological health of a recently restored stream found an immediate—within 7 months of restoration and marked improvement in aquatic ecology. Before the restoration, the stream in question had an adjusted Headwater IBI score of 12, the lowest possible score; the stream's Headwater IBI score had, within 7 months of restoration, increased to 24—an improvement from very poor to poor, but an improvement nonetheless. The survey also found an increase and there was a 10-fold increase in the number of fish living in the stream. (Grieser, IERQC archived webinars: Jennifer Grieser (May 2018) 2018)

On whole, the restoration and constituent daylighting projects have been a net positive, boding well for the Dugway project. However, given the limited scale of this project, it is difficult to directly extrapolate from this project to the daylighting of a stream as large as Dugway Brook.

Notably, this project's daylighting costs far exceeded initial expectations; a fact especially concerning given the inverse relationship between stream length and cost per linear foot of stream length. (Buchholz & Younos, 2007) Urban Stream Daylighting: Case Study Evaluations. (Buchholz & Younos, 2007) According to Sean McDermott, Chief Planning and Design Officer for the Cleveland Metroparks, this expense stemmed in part from permitting costs and the uncertainty inherent in budgeting for a project like this; however, Mr. McDermott also noted that the Acacia Reservation restoration was particularly intensive and that trails and other human adaptions drove costs up. Moreover, Mr. McDermott intimated that the Acacia stream restoration project was built to its budget and



Figure 36: Acacia Reservation Today Source: The Conservation Fund

thus excess funds may have produced increased costs.

Case Study #2: Lick Run Greenway

In 2021, the Metropolitan Sewer District of Greater Cincinnati completed the daylighting of Lick Run. The creek was diverted more than a century ago, in 1893, into a storm sewer to improve sanitation. (Rose, 2021) At a cost of more than \$350,000 (\$11.4. million in today's dollars), the tunnel into which Lick Run was diverted a century ago was one of the largest sewers in the country and was called the biggest public works project ever in the U.S. (Rose, 2021; CPI inflation calculator; Project Groundwork, 2021) Contained within two-footthick brick walls nearly, the Lick Run sewer spans 19.5 feet its widest and ran nearly 2 miles before dumping into Mill Creek. (Project Groundwork, 2021) As a result of its endpoint, combined sewer discharge expelled from the Lick Run sewer ended up in Mill Creek which flowed into and contaminated the Ohio River. (Rose, 2021)

The 1972 Clean Water Act outlawed Sanitary and Combined Sewer Overflows. (Communities United For Action, 2021) Acting under the



Figure 37: Constructing the Lick Run Greenway Source: Engineering News-Record

Clean Water Act the Ohio River Valley Water Sanitation Commission and EPA compelled the Metropolitan Sewer District to enter into two consent decrees to remedy its Sanitary and Combined Sewer Overflows. (Rose, 2021; United States Environmental Protection Agency, 2011) The Lick Run Project is the centerpiece of a far larger project designed to bring the Metropolitan Sewer District's infrastructure into compliance with those consent decrees. (Rose, 2021)

At the time the consent decree was entered into, deficiencies in Sewer District infrastructure resulted in 70 Sanitary Sewer Overflows and 200 Combined Sewer Overflows each year — among the top five in the country for urban CSOs—discharging 14.1 billion gallons of untreated sewage and stormwater creating a public health hazard. (United States Environmental Protection Agency, 2011; Communities United For Action, 2021)These deficiencies also caused sewage to back up into basements causing property damage and further jeopardizing public health. (United States Environmental Protection Agency, 2011; Communities United For Action, 2021) The terms of the consent decrees required that the Metropolitan Sewer District of Greater Cincinnati capture, treat, or remove 85% of the 14 billion gallons of combined sewer overflows (CSOs), eliminate all sanitary sewer overflows about 100 million gallons, and eliminate sewage backups into basements caused by the Metropolitan Sewer District of Greater Cincinnati's sewer system. (United States Environmental Protection Agency, 2011)

In furtherance of these goals, in 2009, the Metropolitan Sewer District of Greater Cincinnati launched Project Groundwork which was comprised of six projects, including the Lick Run Watershed Strategic Integration Plan which was implemented between July 2017 and May 2021. (Case study: Lick run watershed, Cincinnati, Ohio 2017; Vogel, 2021) In turn, the Lick Run Watershed Strategic Integration Plan was composed of 12 projects, including the Lick Run Greenway. (Balanced Growth Program, 2013)

The Lick Run Greenway project called for a new Stormwater Conveyance System with: a 1-mile-long naturalized waterway featuring an aboveground meandering stream channel with natural stone pools and riffles and a riparian edge planted with native plants and trees; a 1.5-mile-long underground stormwater conveyance box running beneath the entire system to handle runoff from large storms; a "decision tree," a chamber containing a weir directs excess stormwater based on flow through the aforementioned underground stormwater conveyance box; as well as wetland forebay and bioinfiltration basins, pond areas, bridges, landscaping and planting upgrades, stormwater planters, a recirculation system, and headwaters at the start of the urban waterway where Lick Run first surfaces. (Rose, 2021; Case study: Lick run watershed, Cincinnati, Ohio 2017; Balanced Growth Program, 2013)

The final product included:

- Restoration of 5,600 linear feet of stream corridor with an open channel and box conduit conveyance system along with 97,380 linear feet of new storm sewer
- 6,500 linear feet of a shared-use path
- 3,000 linear feet of other walks and paths
- Six new vehicular bridges, new sidewalks, curb ramps, and street lighting
- An off-road, multi-use, paved, pedestrian-friendly path along the channel corridor
- Green infrastructure bioswales, bioretention areas, and other drainage improvements to treat roadway runoff

and convey overland flows during the 25and 100-year storms

- Enhancement of existing ravines for water quality treatment and slope stabilization
- Bicycle and pedestrian signage
- Streetscape and open space lighting
- Pedestrian bridge and boardwalk (Strand Associates, Inc, 2022)

Lick Run, on its own, can eliminate approximately more than 400 million gallons of annual CSO discharges from the Lick Run Watershed. (Jordan, 2016; Project Groundwork, 2017) However, in conjunction with a combined with Smart Sewers (real-time control) installed as a part of the broader Lick Run project, the Lick Run Greenway eliminates about 800 million gallons of combined sewer overflows annually into the Mill Creek from the CSO 5 outfall, the largest volume overflow in the Metropolitan Sewer District of Greater Cincinnati's service area. (Smith, Lick Run Greenway, A) Additionally, in coming years, these features will be bolstered by other stormwater control measures, such as downspout disconnection and rain barrel installation. (United States Environmental Protection Agency, 2011)

The added benefit of this approach is the creation of a new park amenity, the Lick Run Greenway. The Lick Run Greenway is expected to prompt investment and draw new residents to the impoverished and depopulating South Fairmount neighborhood. (Rose, 2021; Metropolitan Sewer District of Greater Cincinnati, Green infrastructure reinvigorates underserved neighborhood - the atlas 2021; Rose, The Genius of Water 2021; Metropolitan Sewer District of Greater Cincinnati, Lower Mill Creek Partial Remedy MSD's Recommendation to the CoDefendants of LMCPR Alternative 2012) To ensure that The Lick Run Greenway draws the investment expected coupled, the project is paired with a holistic approach to

redevelopment in the surrounding area. (United States Environmental Protection Agency, 2011) This approach includes community engagement efforts, measures designed to reduce brownfield sites, coordination with the Cincinnati public parks department, implementation of a Land Development Code, support for local businesses during construction, transportation investments, etc. (United States Environmental Protection Agency, 2011)

After an extensive public input and outreach process, the Metropolitan Sewer District of Greater Cincinnati embraced a Daylighting strategy over the proposed tunnel alternative construction of a \$414.4 million (2006\$) 30foot diameter, 1.2 mile-long, underground storage tunnel to capture overflows and direct them to a wastewater treatment plant-due to the tunnel approach's high capital costs, its significant and relatively unpredictable upkeep costs, and limited local utility beyond a reduction in the number of overflow induced high hazard days. Also militating against the tunnel approach was the economic inefficiency inherent in treating stormwater at treatment plants designed to handle pollution-heavy sanitary wastewater and the fact that a tunnel approach would likely necessitate further tunnel extensions, committing the district to the expensive and inefficient endeavor. (Rose, 2021; United States Environmental Protection Agency, 2011; Rose, The Genius of Water 2021; The Metropolitan Sewer District of Greater Cincinnati, Lower Mill Creek Partial Remedy Study 2012; Metropolitan Sewer District of Greater Cincinnati., Lower Mill **Creek Partial Remedy Alternatives Evaluation** Preliminary Findings Report 2012) Illustratively, the Metropolitan Sewer District of Greater Cincinnati estimated that the cost of pumping water through the tunnel alone would cost the district \$1.7 million annually. (Balanced Growth Program, 2013; Coolidge, 2011) On the other

hand, annual operations and management costs are projected at \$459,238 annually (in 2006 dollars) or approximately 20-30 times less than the cost of traditional approaches. (Case study: Lick run watershed, Cincinnati, Ohio 2017; Water Resources Utility of the Future, 2015 UOTF Annual Report design 2015) Likewise, the projected cost of designing and constructing the green alternative constructed at Lick Run was far lower than the tunnel proposal. The initial estimated cost Lick Run Project was about \$192.7 million (in 2006 dollars) with the Greenway portion of the project costing \$89.9 million; however, this latter number eventually grew to \$105.71 million. (Project Groundwork, 2017) In the end, the green way cost approximately \$103 million, while the broader Lick Run Project came in under budget, despite late-stage budget cuts which necessitated a downsized redesign, equating to a savings of about \$170 million less than the initially proposed grey approach. (Rose, 2021; Metropolitan Sewer District of Greater Cincinnati, Budget & Rate Information 2021; ACEC Ohio, 2022; The American Public Works Association, 2022)

The Lick Run Green Way useful example in that it parallels a potential Dugway Brook daylighting project in many ways. Both streams are located in urban areas and flow through majority-black communities similarly situated economically. (United States Environmental Protection Agency, 2011; Cleveland City Planning, 2014) Moreover, one end goal of both projects is the realization of an excellent park amenity. Finally, both the Metropolitan Sewer District of Greater Cincinnati and the Northeast Ohio Regional Sewer District are operating under consent decrees relating to Combined Sewer Overflows; however, where Cincinnati embraced a green alternative, Cleveland opted for the retention tunnel option Cincinnati sought to avoid. Nonetheless, similar sources of funding may be available for both projects. (Leila Atassi &

Andrew Tobias, 2014)

While the cost of the Lick Run Greenway was quite high, the majority of the project's cost is attributable to the Conveyance Components of the Valley Conveyance System (I.E. the conveyance box), rather than the park space itself. (Metropolitan Sewer District of Greater Cincinnati, Lower Mill Creek Partial Remedy Hamilton County Board of County Commissioners Public Hearing 2012) Consequently, the costs associated with a Dugway Brook daylighting project would likely be much lower. Moreover, the fact that the Lick Run Greenway project staff was able to implement last-minute design changes in response to budget cuts indicates that, to some degree, the project was built to its budget. Thus, it may be possible to execute a Dugway Brook daylighting at a reduced cost.

It is worth highlighting the extensive community engagement efforts carried out by the Metropolitan Sewer District of Greater Cincinnati as well as the city's holistic approach to economic development in South Fairmount. Each of these two strategies was critical, both to achieving community buyin and facilitating economic development. (Trump, 2021) In addition to these efforts, the Metropolitan Sewer District of Greater Cincinnati incorporated an educational aspect to its project which ensured community buyin while maximizing the park's utility. (United States Environmental Protection Agency, 2011)

Finally, the emphasis placed on redevelopment in selling the Lick Run Greenway project to the Populus and the project's setting in a neighborhood that has been plagued by disinvestment raises gentrification concerns. (United States Environmental Protection Agency, 2011; Trump, 2021) These concerns are heightened by the fact that linear parks tend to invite gentrification more readily than nonlinear parks. (Brasuell, 2019) However, Lick Run Greenway's planning documents scarcely mention gentrification. Any planning



Figure 38: Lick Run Greenway Source: Strand Associates

effort relating to a potential Dugway Brook daylighting project should do more to address gentrification.

Case Study #3: Nine Mile Run

Between 2003 and 2006, the City of Pittsburgh and the U.S. Army Corps of Engineers engaged in a stream restoration and daylighting project aimed at restoring Nine Mile Run, a Pittsburgh stream known until then as "Stink Creek," to something resembling its natural state. (University of Pittsburgh, 2014; Bain et al, 2014) At 2.2 miles in length, the Nine Mile was the largest stream ecology revitalization project ever attempted in the United States to that point. (Harnik, 2007)

In the early 20th century, the site had been recognized by Fredrick Law Olmsted Jr. as "a striking opportunity for a large park." (Stephen, 2001) However, the site was purchased by the Duquesne Slag Company in 1920 and used as a landfill for slag, a toxic by-product of steel manufacturing until 1972, the 22 cubic megameter slag dump was covered over. (Bain et al, 2014; Stephen, 2001) This dumping left the Nine Mile Run Valley a moonscape, while road inputs, leaking sanitary sewer systems, combined sewer overflows, and slag leachates poisoned the stream. (Harnik, 2007; Stephen, 2001) In the mid-90s, Nine Mile Runs potential as a park was again recognized. Seeking to spur a development project— the Summerset neighborhood Development Project—to attract wealthy new citizens, the city, acting through its Urban Redevelopment Authority, purchased the site for \$3.8 million in 1994. (Harnik, 2007; Stephen, 2001) To quell neighborhood opposition to the project and attract residents, the city added 115 acres of the site to the adjacent Frick park and contracted Biohabitats Inc. to create a stream restoration plan in 2000.

In addition to, major stream restoration efforts targeted at Nine Mile Run, the plan produced by BioHabitats called for additional restorative measures targeting tributaries of Nine Mile Run. (Pinkham, 2001) The plan also called for the daylighting of 200 feet of the Falls Ravine stream within Frick Park to create a surface channel and wetland connecting the stream with Fern Hollow creek, which flows into Nine Mile Run. (Biohabitats, Inc., 2013; Pinkham, 2001) Additionally, the plan called for the creation of a riffle-pool complex, deconcentrating the stream flow, on-site material reuse, and the planting of native sedges, rushes, grasses, and trees to stabilize stream banks. (Harnik, 2007) These Improvements were bolstered by an ambitious rain barrel project, a slag leachate capture system, the removal of some hydraulic barriers to fish passage, and the creation of the Nine Mile Run Watershed Association—an organization focused on citizen engagement to protect the health of the watershed.

Carried out between 2003 and 2006 (with additional reparation work performed in 2007 and 2009), the stream restoration project cost \$7.7 million. (University of Pittsburgh, 2014) The additional reparation work performed at the site is likely attributable to a failure to incorporate available hydrological data. (Bain et al, 2014) This is not a problem unique to the Lick Run restoration; a comprehensive review of urban stream daylighting projects completed in 2007 found that only "a small number of projects... reported conducting hydrologic studies prior to construction, while many others simply designed by 'trial and error'" and that "[the] most common forms of pre-design hydrologic studies were upstream meander and width measurements and modeling of hydraulic events for bankfull discharge during storm events," while "[d]esigns done by "trial and error" often used quick reviews of aerial photos or reference reaches as guides for stream

channel placement." (Buchholz & Younos, 2007)

During and following the restoration, the Watershed Association and its predecessor organizations partnered with local schools to create opportunities for outdoor education, and thereby garner public support while maximizing the site's utility. (Harnik, 2007; Stephen, 2001) This approach along with a robust public outreach effort ensured public support for the project despite its high costs and many shortcomings; the approach succeeded because it centered organized citizen leadership and community engagement through art and education. (University of Pittsburgh, 2014; Harnik, 2007; Stephen, 2001)

The Nine Mile Run stream revitalization project succeeded in: creating a beloved park amenity; contributing to the success of the Summerset neighborhood development project; reducing flash flooding through channel rerouting; stabilizing the reconfigured streambed; and recolonizing trees on the once barren slag pile slopes. (Harnik, 2007; Stephen, 2001) Despite early fears that the reestablishment of a healthy stream ecology was impossible, the project has yielded significant ecological benefits and stream health has improved continuously since the stream restoration though still today falling short of perfection. (Harnik, 2007; Bain et al, 2014; Nine Mile Run Watershed Association, 2016)

A restored Dugway Brook, as a formerly culverted urban stream in an industrial city, is likely to face challenges similar to those faced by Nine Mile Run during its long recovery process. Consequently, a Dugway Brook daylighting project may benefit from embracing similar strategies. For example, a Dugway Brook daylighting campaign might garner long-lasting public support through an aggressive outreach strategy that instills in the public a sense of ownership of the project. Alternatively, in examining the restoration of Nine Mile Run, it is possible to identify key missteps which hamstrung the project and led to unnecessary expenditures. Most notably, a failure to conduct adequate hydrological studies of Nine Mile Run led to a failure to anticipate appropriate hydrologic boundary conditions. In turn, this failure caused poor design choices and stream channel instability during extreme flows, necessitating reparative interventions, such as channel relocation and the addition of structures to improve channel stability. (Harnik, 2007; Bain et al, 2014; Red Horse Environmental, 2017).

Finally, as was true of the Lick Run Greenway Project, the Nine Mile Run Stream Restoration was motivated in part by a desire to fuel economic development. Thus, it raises similar concerns relating to gentrification. Moreover, unlike the comparatively recent Lick Run Greenway Project, the Nine Mile Run Stream Restoration has demonstrated its ability to elevate property values over twenty years. (University, 2007)



Figure 39: Restored Nine Mile Run Source: Atlas Obscura

COMMUNITY ENGAGEMENT

CHAPTER 4

COMMUNITY ENGAGEMENT

Community Survey Process

The design of all surveys and the community and personal interviewing informed consent forms were updated by the Survey Task Group, reviewed by the planning studio class, and approved by the Cleveland State Institutional Review Board. Mr. Peter Roth, Branch Manager of the Glenville Public Library, graciously invited students from the Planning Studio class to occupy space for presenting its in-person survey project. Students interacted with Library patrons and distributed research questionnaires regarding the Dugway Brook Watershed restoration project.

In Person Sessions: In-person survey sessions were organized to accommodate 2 students volunteering for 2 hours each at the Glenville Public Library. The dates of operation were set for March 10, 2023, to March 17, 2023. The actual dates, however, of operation took place between Monday, March 13, 2023, to Saturday, March 18, 2023, totaling 39-volunteer hours.

Online Web Sessions: Online-web survey participation sessions were organized via the Qualtrics Online Survey Platform. Access to the survey is by a hyperlink and a QR Code for smartphones. Potential participants are reached through a neighborhood group email list, newsletters, and/or social media pages.

Post-office Mail Sessions: Nearby residents from the Dugway Book project target areas are mailed a physical survey to their homes. In addition to the Dugway Brook survey, residents will receive a letter of introduction, a CSU letter of informed consent, and a self-addressed return envelope with postage.

Community Engagement Overview

Community engagement is a necessary component of any planning process. In this particular project, engagement is even more of a focus because it is building the foundation for further community engagement efforts and establishing best practices for reaching community members in the study area.

Because community engagement was considered one of the most high-priority aspects of this planning project, we took extra steps to ensure thorough public participation. The official community engagement process consisted of four separate parts: a mail survey for Glenville and Bratenahl residents who live adjacent to the proposed daylighting and estuary rehabilitation project, an online survey that could be accessed via QR code or through a unique links, in-person tabling at the Cleveland Public Library Glenville Branch, and stakeholder interviews.

With the mail survey, we sent the same number of surveys to Bratenahl residents as we did Glenville residents. These totaled approximately 400 mail surveys to each distinct community. We gave respondents the option to either send the completed survey back to us in a prestamped envelope or complete the survey using the QR code that we included on the first page of the survey. In the envelope containing the surveys, we also included a letter from Mayor Licastro in Bratenahl and City Councilperson Hairston in Glenville. Prior to commencing our community engagement efforts, the survey questions, stakeholder interview questions, and the survey consent from were submitted and approved by Cleveland State University's Institutional Review Board (IRB) for Human Subject Research. The online survey was created using Qualtrics and was made available to the public from late-March through late-April.

To begin the survey, respondents were required to answer two default questions to confirm that they were 18 years or older and consented to their participation in the survey. Survey responses were anonymous and stakeholder interviews were confidential. Because our survey area covered two distinct neighborhoods, Bratenahl and Glenville, we wanted to ask questions to each of these populations separately. To accomplish this, we branched the survey by asking what community responded lived in which allowed the survey to populate questions specific to their geographical location. We expected the interests of Bratenahl and Glenville to be slightly different and wanted to ensure that our questions matched each community.

Overall, we received 102 survey responses with 22 of those coming from the QR code and 80 coming from the mail survey. An important point of note is that the majority of Bratenahl respondents utilized the mail survey as their preferred method.



Survey Reach



Respondent Neighborhoods



Figure 40: Survey Respondent Neighborhoods



Figure 41: Familiarity with Dugway Brook

Glenville Responses



Would you like to see a portion of Dugway brook that is currently buried in a pipe under Glenview Park restored as a natural stream?



Figure 42: Frequency of Visits to Glenview Park







"People living south of Lakeshore Blvd. have zero access to Lake Erie from within Bratenahl."

> *"We* would like additional law enforcement."











Figure 47: Desired Amenities



Figure 48: Desired Types of Development



Figure 50: Interest in Publicly Accessible Greenspace





"Would like to see a real walking trail created"

"Would be nice to have a public lakefront space in Bratenahl."

Bratenahl Responses



Figure 49: Desired Types of Development

"There's not enough greenery in the neighborhood besides uncut grass lots overgrown with weeds." *"We need to think about the children. I don't think we have enough places children could play sports and do activities."*

"Any public access to the water would be a great asset to Bratenahl."

Communities Compared



Figure 52: Satisfaction with Neighborhood Greenspace



Figure 53: Interest in New Trail Connections

Survey Demographics

Do you have school-age children residning at home with you?



Figure 54: School-age Children in Household





STAKEHOLDER INTERVIEWS

Each member of the planning team interviewed a project stakeholder. Designs for the personal stakeholder interviewing questions, letters of request, including the informed consent procedures were developed and updated by the Survey Task Group, reviewed by the planning studio class, and approved by the Cleveland State Institutional Review Board. Interviews took place between March 20 - 31, 2023. The questions and a summary of the answers is below.



How do you see the community using and benefiting from the space around the daylighted stream and restored wetland?

From an environmental planning and access to nature standpoint, daylighting dugway would be a significant improvement for the community to naturalized areas. It must be balanced so that community members also have access to recreation. This is especially important for the schools. It is important to be able to balance the two. Trail connections are paramount; if you could get a trail connection all the way up into forest hills, there is significant acreage. Talk with neighborhood planners. It will be a significant piece of infrastructure that will create a common corridor between Bratenahl and Cleveland, and the dugway watershed corridor as well. Ultimately an urban built-out park that will connect communities such as Glenville.

Do you foresee any challenges involved in the project that you are concerned about? There are some challenges with community perceptions to naturalized areas with it being unkempt, wild, and scary. Public perception is a challenge that as a society we must get over. The biggest challenge is putting together a consensus and finding the funding resources.



If you have been involved in similar projects in the past, what are some of the challenges that you faced?

With daylighting, you have to create the entire bank ecosystem. All predicated with grading and depth of the brook. Also, all of the combined sewer systems that are going into the culvert. The sewer district has done a lot to reduce sewage into the culvert. We learned a lot about daylighting and techniques and were appreciative of the tributaries. Understand the benefits outside of managing water flow and creating a natural aesthetic for an urban area.



How do you foresee the CSU Planning Studio report and presentation being used to further the Dugway Brook daylighting project?

It is going to be really, really helpful and the expertise of students, professors, and other stakeholders will lead to more investment and more dollars being invested to further the study. The Rockefeller plan was used as a catalyst for local CDCs to push the council people to move the project forward. This will lead to other projects like trails and other amenities.



What are your main goals and objectives you have as a stakeholder in this project? Balance natural areas with more maintained and active recreational space. We need to create opportunities for learning how the project happens and for the residents to make sure they become partners in the project.

RECOMMENDATIONS & IMPLEMENTATION

CHAPTER 5

GUIDING CONCEPTS

To address the established project goals and feedback received through the community survey and stakeholder interviews, design and development concepts were created to guide the project and recommendations. Figure 56 outlines these design and development concepts.

Ecological enhancements will take place in Bratenahl where the Dugway Brook is not culverted and where the Dugway Brook Estuary meets Lake Erie. Additionally, the Western Reserve Land Conservancy property in Bratenahl can be maximized to its fullest potential for public access and enjoyment of the Dugway Brook Estuary. In addition to creating improved connectivity through the Dugway Greenway, the 105th St. underpass presents an opportunity to develop a gateway between Glenville and Bratenahl with improvements and enhancement to the roadway and bridge underpass. This gateway will enhance the connection to Dupont Avenue, Glenview Park, and the Dugway Greenway.

New single-family infill development is an opportunity to redevelop the abandoned and underutilized parcels near Glenview Park. Similarly, parcels along St. Clair Avenue and E. 105th Street are prime locations for small business development near the revitalized Glenview Park. Glenview Park itself can incorporate many enhancements as part of the greater daylighting project and the housing surrounding the Park should be invested in to maintain important neighborhood characteristics, develop placemaking and rehabilitate existing housing.

As part of the greater Dugway Greenway, a bike trail route can connect Forest Hill Park to

Bratenahl and increase connectivity between Glenville, surrounding neighborhoods, and other local and regional transportation and trail connections. Finally, if necessary, existing active recreation facilities in Glenview Park can be relocated to the Glenville Recreation Center to create a recreational activity node within the community.

Five themes have been developed to incorporate these guiding concepts with our project goals and they are: Community Engagement, Community Development, Connectivity, Ecology, and Reinvestment.





Figure 56: Guiding Design & Development Concepts Graphic by Hinal Sorathiya

COMMUNITY ENGAGEMENT

It is the recommendation of Capstone Studios that the Dugway Brook project partners develop and implement a well-planned-out Community Engagement "Out-Reach" Program based on the values below.

Core Values:

- 1. Organize Town Hall Meetings and Project Site Tours.
- 2. Develop, plan, and staff listening sessions and other community leadership initiatives.
- 3. Engage Glenville High School Students in major community engagement events.
- 4. Engage core communities in developing a Daylighting design plan.
- 5. Financially, support community engagement plans and projects.
- 6. Daylight and restore stream damage in the Glenville Neighborhood.
- 7. Restore wetlands on the lakeshores of Bratenahl Village.

The following is an example of developing a community outreach plan to maximize the project's full potential.

Town Hall Meetings:

- Utilize Public Meetings Places to simulate the greatest amount of information in a brief time period to large groups of people. This is a terrific opportunity for the project to involve high-school and college students and for the students to work off required volunteer course hours
- Dugway Project Registration Tables are essential for both receiving, distributing, and publishing information. Project Leaders need contact and other related information from citizens and citizens

should be given as much information as possible concerning the project. Note: visualization is key when communicating information to the community.

- Pre-advertising in a proactive positive matter of the town halls as well as (any other) meetings are necessary: people cannot attend meetings they do not know about. Timing is also a key element to people being aware of events happening either in and/or around their community. (Please be aware: This is a major loophole for not engaging communities in the decision-making process).
- Town Hall Meetings should be developed in a user-friendly environment. To address the greatest number of participants at any given time, when suitable project leaders should

Develop Stipend-based Stewardship Programs

Partner with Local Organizations to Develop Engagement Strategies

Foster Relationships with Community Leaders

> Develop a Two-Year Engagement Plan

collaborate with public space entities that have auditoriums which can be booked and/or rented for Little to No Cost, especially when it is a public event. Furthermore, the project's event will gain additional advertising and exposure

 Example: The downtown Cleveland Public Library – Louis Stocks Branch offers a flexible meeting and event space with technological capabilities. On the first floor of the East Cleveland Public Library is an auditorium that seats 250 people. Both Libraries are on the main line Euclid Avenue strip and are easily accessible by public transportation

- Citizen Recruitment: Town Hall meetings should also be used for recruiting citizens for other events, such as project tours, listening sessions & leadership training sessions.
- Because a major component of the Dugway Project is "Connecting Communities in the Design Process." It is important that when advertising the project's public events, information should cross community boundaries,



Figure 57: Community Engagement Matrix Graphic by Capstone Studios

especially those communities that are directly connected to the Dugway Brook Corridor.

• Example: A Dugway Brook Town Hall Meeting may be held in the Glenville Neighborhood; however, inter-connecting and other interested communities should also be invited to attend. Invites can easily be accomplished through the distribution of information about the event.

Listening & Training Sessions:

- Listening and training sessions should be organized. It is a way that citizens are engaged in a more personal setting of 25 to 35 people per setting; with no more than 50 people per setting or training.
- The projected budget of \$7,500 for childcare services should be changed from the \$1,250 for \$50 gift card incentives.
- The budget should allocate its \$7,500 to be given away to 150 engaged persons at \$50 per gift card.
 - Example: Change the budget to include the \$7,500 for participating adults and use the \$1,250 for the free childcare service. Each childcare service would cost \$250 (\$250 per session / 2 hours = \$125 per hour per service person).
- Listening sessions should be conducted within 90 minutes (about 1 and a half hours) to 2 hours accordingly.
- Listening sessions should be conducted at smaller event spaces such as public library community rooms.

Community Walking Tours:

 Dugway Brook is a long trail, therefore walking tours should incorporate a bus tour. Use small size neighborhood buses such as a School Bus, Lolly-the-Trolley, or the RTA Community Circulator bus. This is another way of building additional collaborations and partnerships.

Community Engagement Best Practices

Assess the community's preferred methods of engagement.

Whether planning for in-person engagement, online engagement, or a combination of both, make sure to choose a method that is accessible and appropriate for the community you are trying to reach. If appropriate, use an existing community meeting.

Plan to use multiple channels or provide multiple opportunities.

Consider a mix of traditional and nontraditional communication channels for getting the word out about your community engagement opportunity. You may also choose a variety method along the continuum.

Make sure your methods are accessible.

There are many distinct aspects of accessibility that you need to consider, including physical accessibility, language, culture, and location. Identify and address other barriers for participation, like childcare, food, or transportation.

Ask questions that are open-ended, not leading, and nonbiased.

Asking open-ended questions gives you the chance to learn something you were not expecting and provides space for discussion. Base your questions off what you would like to learn. Ask other community organizations to review your questions ahead of time to ensure you are not framing your questions in a way that perpetuates stereotypes, introduces biases, or stigmatizes members of the community.

Get active consent.

You will need at least verbal consent for most methods of engagement (Washington State Department of Health, n.d.).



Figure 58: Guided Walking Tours with Roy Larick Source: Bluestone Conservation



Figure 60: Community Engagement Source: Famico Foundation



Figure 61: Louis Stokes Wing, Cleveland Public Library Source: Cleveland Public Library



Figure 59: Cleveland Public Library, Glenville Branch Source: Glenville Library

COMMUNITY DEVELOPMENT

Environmental Justice

The Environmental Protection Agency (EPA) has defined Environmental Justice as, "Environmental Justice is 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" (EPA, 2023). EPS has further added that achieving environmental justice will ensure people from all walks of life receive the same standards of protection from environmental and health hazards and access to the decision-making process to have a healthy and sustainable environment in which they function.

Environmental Justice is not a new concept. However, while implementing big-scale environmental or community projects in neighborhoods, towns, or cities, we often overlook it. The best people who know where the problem lies and how to form a solution are the residents or community members with the help of local officials and other stakeholders. Management of just a part one part of planning for solutions to environmental issues (Pradhanga, Davenport, & Green, 2019). The other major part is getting the local community involved in the decision-making process.

According to studies, community participation can have ecological and cultural benefits, and increase public trust (Pradhanga, Davenport, & Green, 2019). The segment of the population who are most susceptible to the effects related to environmental problems is least likely to be represented ((Pradhanga, Davenport, & Green, 2019). One way to engage this group is to have a community-driven approach rather than a top-down, agency-driven one; planning and implementing restoration projects that are beneficial to the residents rather than only benefitting the investors economically likely is likely to attract community support from various levels (Cross & Chappell, 2022).

Partnering directly with community members is important to incorporate diverse viewpoints and determine priorities in terms of initial decision-making, implementations of goals and objectives, realizing stages of the projects, and eventually sustainable maintenance of the results to keep yielding long-term benefits. Implementation of effective ways to hear community voices, regardless of their economic status, is vital when establishing the elements of environmental justice. Such ways be, but should not be limited to, townhall meetings, circulating fliers, via emails and phone calls, by conducting stakeholder interviews, or by traditional methods of surveys, many of which have been implemented during community engagement and feedback stages of this project of daylighting Dugway Brook.

It is important to understand, however, that not all means of communication will be applicable to all residents. Instead, different techniques or a combination of different methods may be used to receive input and tailor their involvement during different stages (Cross & Chappell, 2022). Project organizers and managers must include in their plan to spend considerable time with the residents to explain the program in hand in order to achieve a considerable amount of trust in support of the program; we have seen time and again how marginalized communities have been overpromised and under-delivered (Cross &
Chappell, 2022). In cities like Austin, TX and Atlanta, GA, disadvantaged, and marginalized residents formed their own groups to press for their inclusion in decision-making for stream restoration projects.

The importance of involving the community in the restoration is a crucial point that most planners agree on. However, there are challenges to achieving this successfully as there is not much literature or guidance available on managing the process of balancing the interest of various interest groups. Professionals who are skilled in public communication and public involvement must be included as part of the planning and management groups (Cross & Chappell, 2022). Educating and making the public aware, regardless of their support status, of the benefits and shortcomings of a program(s) in hand can lead to active and successful participation and thus establish a crucial element of environmental justice. As mentioned during various stages of this report, special caution must be taken to avoid gentrification and properly address gentrification concerns.



Stream restoration at

Figure 62: Institution-Community Integration zSource: Freshwater Science

Marginalized community members will be more hesitant to participate if examples of gentrification of similar projects or programs are more widespread (Cross & Chappell, 2022). Hence, before undertaking projects, management in charge of restoration or daylighting processes may have to compensate for any past mistakes or injustices, or failed pursuits to involve the residents for their time. They may also have to undergo training on race and class, and other demographic aspects, to understand the sociohistorical development and background of the region or town in consideration (Cross & Chappell, 2022).

Recognition is a very important component of environmental justice that must be considered and that pertains to respect for cultural differences and personal dignity, the lack of which leads to environmental racism (Meenar, Fromuth & Soro, 2018). Scoggins et. al, (2022) has proposed a vision for restoring degrading urban ecosystems to sustainable resilient ecosystems via institution-community integration (see figure 62), which can serve as a more efficient decision-making pathway to serve the cause of environmental justice when it comes to community involvement in the decision-making process in a project such a daylighting of Dugway Brook or similar.

Daylighting a stream can lead to multiple economic, social, and environmental benefits discussed in this report – which are widely expected positive outcomes from daylighting Dugway Brook. The communities in Glenville are expected to see their home prices go up, for example. But caution must be taken to understand if all the expected outcomes from this project will yield acceptable results which will be distributed fairly and equally amongst all residents. As seen from the surveys conducted, there were legitimate concerns amongst residents about their home prices going up to the point of gentrification or their property or other tax rates increased to an unaffordable level, in addition to other similar concerns. What one may see as sustainable and ethical may be unjust and unsustainable to another. To make this project environmentally justifiable, gentrification and similar concerns can be addressed through provisions in city laws or through ballot measures. We must ensure daylighting Dugway Brook by no means may price out the residents of their own homes or neighborhoods.

Home Rehabilitation

Renovating homes for community development is a great way to improve the overall livability of a neighborhood or community. During our tour we noticed homes along Glenview Park that would benefit from a community development program that provides assistance to renovating their homes.

Community involvement is critical for community development programs to be successful. It is important to engage the community in the renovation process to ensure that their needs and preferences are taken into account, and to build support for the program. Implementing a renovation program for the neighborhood can improve homes' safety, comfort, and functionality, making them more livable and appealing.

Studies have shown that homes near greenways and trails can offer an excellent opportunity for people who are looking to combine their love for the outdoors with their desire to live in a comfortable and safe home. Greenways and trails provide a variety of benefits, including access to nature, opportunities for exercise and recreation, and connections to local communities. Renovating homes in a community development program can significantly impact both the individual homeowners and the community as a whole.



Develop Community Wellness Programs

Pursue Opportunities for Affordable Hhousing

Identify Key Neighborhood Characteristics to Develop Forms of Placemaking



Figure 65: Slow Roll Cleveland Event Source: Slow Roll Cleveland



Figure 66: Public spaces as gathering spaces Source: PCMA Convene

Figure 63: Home before rehabilitation Source: Google Maps



Figure 64: Home after rehabilitation Source: Google Maps

CONNECTIVITY

We recommend the creation of new multiuse trails that will unify the area by creating connections to other neighborhoods and public spaces.

The Dugway Greenway will extend through the heart of the Glenville neighborhood from Forest Hill Park in East Cleveland to Bratenahl. The Greenway will intersect with six bus routes as well as the Red Line and Health Line. Glenville is highly walkable, has high intersection density, and is intersected by numerous transit routes; however, Glenview Park and Glenville are disconnected from surrounding neighborhoods and regional assets, such as Lake Erie, Gordon Park, and the Greater Cleveland Regional Bikeway Network.

Our vision for the New Dugway Greenway presents the opportunity to forge a new connection from Glenview Park to the greater regional trail system and improve connections with public transit. Increasing connectivity through a new Greenway is important because this investment will support community wellness, recreational services, and regional transit. Moreover, this investment will promote conservation while furthering the County's mission of developing interconnected bicycle facilities and trails. Most importantly, this investment can spur growth in a community that has experienced decades of disinvestment.

In furtherance of these ends, this proposal calls for the development, with the Cuyahoga County Planning Commission, of a trail plan based on community input. This plan would encompass a system of multi-use trails, sidewalk improvements, and wayfinding in underserved areas. Additionally, this proposal also embraces the creation of a gateway between Bratenahl and Glenville at the East 105th St. underpass, incorporating new lighting, artwork, and other improvements that will transform the underpass and attract use.



Figure 67: Detail of the proposed Dugway Greenway Graphic by Mike O'Malley



Figure 68: Dugway Greenway connecting to the greater Regional Bike Network Graphic by Mike O'Malley



Figure 69: Protected bike lane in Forth Worth Source: Fort Worthology, photo by Nathan McNeil

Develop a Trail Plan with the Cuyahoga County Planning Commission

Listen to Community Perspectives to Develop Trails in Underserved Areas

Implement a System of Multi-use Trails, Sidewalks Improvements, and Wayfinding



Figure 70: Existing E. 105th St. underpass, Glenville Source: Google Maps



Figure 71: Potential underpass improvements Source: Google Maps

Wayfinding

Connectivity throughout Glenview Park and the Greenway can be enhanced with wayfinding and interpretive signage. Wayfinding is important for educating visitors and informing them of their surroundings. It will allow visitors to familiarize themselves with their surroundings, the available park amenities, and destinations within Glenview Park and along the Dugway Greenway.

Capstone Studios recommends incorporating a variety of wayfinding into the park and Greenway design. In particular, large Gateway signs can let visitors know they have arrived at a key desination along the greenway, such as Glenview Park. Signs such as this can be located at the E. 110th Stree, St. Clair Avenue, and Dundee Dr. entrances of Glenview Park.

Large directional signs can be places at intersections within the Park and throughout the Greenway to direct pedestrians and cyclists to destinations along the Greenway. This type of signage can feature route distances and times for both cyclists and pedestrians.

Additional, and smaller, directional signage can be placed throughout the Park and Greenway to inform visitors they are on the right path to their destination. Mile markers can be placed along the entirety of the Dugway Greenway and interpretive signs, placed in select locations within the Park and on the Greenway, can highlight key features of the park and stream restoration.

Capstone Studios recommends telling the story of Glenview Park, the surrounding neighborhoods, and Glenville through images and information shared on wayfinding signs. The Dugway Greenway logo and branding can be incorporated into these signs and suggested materials include steel and wood to represent the City of Cleveland's history and the



Figure 72: Gateway Sign Graphic by Anna Mates

surrounding natural landscape. The adopted signage system should enhance the user experience and provide pedestrians and cyclists with information while visiting Glenview Park and using the Dugway Greenway. It is important signage is consistent and maintains a coordinated brand and aesthetic that reflects the unique characteristics of the surrounding neighborhoods to acknowledge the history and identity of Glenview Park, Glenville, and the region to which they will be connected through the Dugway Greenway.



Figure 73: Large and small directional signs Graphic by Anna Mates



Figure 74: Mile marker and interpretive signage Graphic by Anna Mates

Interpretive Signage

Interpretive signage such as this can be used to tell the story of Glenview Park, Glenville, Dugway Brook, and their surroundings. Topics can include the park's history and evolution as well as history and facts about the Glenville neighborhood. In particular, signs like this can draw attention to key features of the stream restoration and ecological rehabilitation that has taken place since the daylighting project's completion. Including a section such as "What Can You Find?" will invite visitors to learn about the Dugway Brook restoration and interact with their surroundings as they search for birds and aquatic animals that have returned to area.

Glenview Park Then and Now



The original Glenview Park was returned from E. 110th St. to Dupont Avenue.



Figure 76: Interpretive sign detail Graphic by Anna Mates

Prior to 2019, Glenview Park had limited accessibility, poor visibility and compromised security due to its secluded location between Leuer Avenue, Glenview Avenue and E. 110th St. Original park amenities included baseball diamonds, a public swimming pool and several basketball courts. In 2017, the City of Cleveland proposed a plan to rebuild the park on higher ground, taking advantage of underutilized greenspace in Glenville. dt oa naturalized area with a walking trail extending

In 2019, the new Glenview Park was relocated to the east of E. 110th St., creating a more accessible park for the community. New features included a central plaza with a picnic shelter, play spaces and a splash pad. Basketball courts and an exercise loop path provided active recreation facilities, and a walking path connected St. Clair Avenue to the newly naturalized park space west of Hazeldell Rd.



Figure 75: Example interpretive signage for Glenview Park and daylit Dugway Brook Graphic by Anna Mates

ECOLOGY

Glenview Park Transformation: Illustrative Site Plan

The daylighting of Dugway Brook, which is depicted as meandering from south to north through the middle of Glenview Park, will be the focal point of the park and inspiration for the park's other features. The daylighted stream will be between eight and ten feet wide, flanked on either side by a riparian buffer with native plantings, including tall grasses and wildflowers. Some smaller, area-appropriate trees will also be planted in the riparian buffer. The total width of the stream with the riparian buffer is depicted to be 165 feet. The stream re-enters the culvert at two points, one to the north and one to the south, in the park.

Park patrons are encouraged to interact with the stream at any of the park's three bridges, which can be used as stream crossings, but also as places of nature observation. Interpretive signage will be present at all of the bridges, informing park patrons of the kinds of plants, insects, and animals they may see from their bridge viewpoint. Trees planted around the bridges provide shade from the sun for a more comfortable viewing experience in the spring and summer. Trees will be planted throughout the park to address the park's lacking tree canopy, provide comfortable shaded areas for park patrons, enhance the natural feeling of the park, and create a barrier for privacy between the park and neighboring homes.

Walking paths on either side of the stream create an area for pedestrians to stroll and enjoy the natural scenery. Walking paths extend from the park's entrance, located at the southwest corner on St. Clair, to the park's amenities and recreation spaces, located in the park's northeast corner. Walking paths also lead to picnic areas throughout the park and to the park's nature playground to the southeast.

A bike path extends from the park's entrance to the park's northwest corner, culminating in a loop that provides access to the park's amenities and recreation spaces. A bike path connection at East 105th Street links the Glenview Park bike path to the Cuyahoga Greenways Network, connecting Glenview Park with hundreds of miles of multi-use trails in Cuyahoga County (Cuyahoga County Planning Commission, n.d.). Bike racks can be found throughout the park so that cyclists using the bike trail can take a break to enjoy the park's natural scenery and amenities if desired.

Glenview Park's proposed amenities in the northeast corner include a community building with public restrooms, a community garden, playground, splash pad, and multipurpose pavilion. The community building would be open to the public and could serve a variety of purposes, including as a nature center educating visitors about the history of Dugway Brook and its ecology. Glenville High School students and others could use this space to learn about local natural history and environmental science in a way that is applicable to their own lives and communities. A community garden near the building could be used as a tool to educate visitors about growing their own food or taking up a new hobby that can help beautify their communities. A playground and a splash pad provide recreation spaces for young children and families. A pavilion could be used as a gathering space where friends and families can picnic or where



Figure 77: Illustrative Site Plan of proposed Glenview Park enhancements Graphic by Sophia Jones

community events can be held. This pavilion replaces the pavilion that currently stands in the center of Glenview Park, which will need to be removed to allow for stream daylighting. Other amenities that will be replaced include a basketball court and a baseball diamond, which will be relocated closer to Glenview High School.

Outside of Glenview Park, to the southeast, there is space for new commercial development, which could address the community's desire, according to survey responses, to have a grocery store, laundromat, hardware store, small eatery or other similar business.

Relocated Amenities

One of the most crucial factors to take into account when purchasing a home is the availability of, and access to, neighborhood amenities. Living close to facilities like parks and cafes fosters neighborhood pride, safety, social trust, and favorable perceptions of the place. Meeting rooms, play areas, parks, and exercise facilities all promote increased community involvement. In these public areas, residents can get to know their neighbors and build community.

One of our design recommendations is to relocate the existing active recreation facilities in Glenview Park to the south, locating them near the existing basketball courts and baseball diamonds at the Glenville Recreation Center. Figure 78 illustrates where these facilities can be relocated. The red figures indicate where the existing basketball courts and baseball diamond are located, while the blue figures indicate the proposed locations of the new facilities that may be moved from Glenview Park.

Relocating these facilities can create an active recreation node within the neighborhood, centered around Glenville High School and the Cleveland Glenville Recreation Center.



Figure 78: Location of Relocated Amenities Graphic by Kay-Lee Willard and Hinal Sorathiya



Figure 79: Potential location for relocating active recreation amenities from Glenview Park Source: Google Maps

Cross Sections

The following cross sections illustrate in more detail the capacity of Glenview Park to accommodate the previously discussed enhancements. This cross section is taken through the narrowest section of the park to show there will be space for these improvements throughout the park. At its narrowest point, Glenview Park is approximately 300 feet wide between the houses that are on E. 110th and E 112th Streets.

Figure 79 illustrates where the cross section was taken, from E. 110th Street to E. 112th Street, through the narrowest area of the park. Figure 80 illustrates the full cross section, showing the daylit Dugway Brook with a riparian buffer, walking trails, a bike trail, and new park amenities. Figures 81 - 86 depict each area of this cross section in more detail.



Figure 80: Cross section cut line Graphic by Kay-Lee Willard and Hinal Sorathiya

THEAT

300 FT

Figure 81: Full cross section through Glenview Park Graphic by Kay-Lee Willard and Hinal Sorathiya Moving west to east, there will be sitting places with benches and picnic tables which will be 10 ft wide, and Gazebos surrounded by trees for people to sit and have social interaction will be 12 ft wide, as shown in Figure 83. Next is the two-way bike trail, which is also 12 ft wide and will have no pedestrian access. Moving further east, there will be a walking path which is 8 ft wide where people can walk, jog, or skateboard. Considering safety, there will be lights installed throughout the park, especially along the bike route and at sitting places. To enhance the tree canopy, trees will be planted on both sides of the bike route and walking



Figure 83: Cross section detail, West Graphic by Hinal Sorathiya



Figure 84: Cross Section detail, West Central Graphic by Hinal Sorathiya paths. This will cool the park, making it more enjoyable for visitors year-round. People can sit and spend time on the amphitheater style steps while admiring the scenery, shown in Figure 84. There will be another 8 ft wide walkway so visitors may approach the stream and have a close-up view of it. Figures 85-87 show the East Central and East Park sections can incorporate similar elements. The East section features a nature playground that will be 20 ft wide. We imagine Glenview Park incorporating design elements like the stairs at Lakewood Park and bridges where pedestrians can cross the stream.



Figure 85: Park cross section - East Central and East Graphic by Hinal Sorathiya



Figure 86: Cross section detail, East Central Graphic by Hinal Sorathiya



Figure 87: Cross Section detail, East Graphic by Hinal Sorathiya



Figure 88: Glenview Park, existing Photo by Kay-Lee Willard



Figure 89: Glenview Park, reimagined Graphic by Anna Mates



Figure 90: Glenview Park interior, reimagined Graphic by Anna Mates



Figure 91: Glenview Park, reimagined Graphic by Anna Mates

Daylight Dugway Brook to Improve Water and Ecological Quality

Grow and Strengthen Glenville and Bratenahl's Urban Tree Canopy

Coordinate with Local Environmental Organizations to Identify Locations for Native Plantings

REINVESTMENT

Site Redevelopment

The parcel is owned by the city land bank. The site used to be the location of the YMCA of Greater Cleveland until 2005 when it became the General Johnnie E. Wilson Military Academy, the first charter school sponsored by the Cleveland Metropolitan School District. The school closed in 2017 and subsequently sold the property to a private owner, who razed the structure after taking title. The property then sold to another private firm before the county executed a tax foreclosure and sale to the city land bank in 2022 (Cuyahoga County Fiscal Office).

The property is zoned as single-family, with a minimum lot size of 4,800sq. ft and a 35' height limit (Cuyahoga County Fiscal Office). The estimated fair market value, as determined by



Figure 92: Aerial view of proposed development site Source: Cuyahoga County Auditor, MyPlace

the county fiscal office, is \$30,000. The property has excellent visibility, with 15,0333 average annual daily traffic (ODOT Tims Traffic Count Segments), and also has a walk score of 70 (walkscore.com).

Highest and Best Use Analysis

To determine the ideal use for the site, we created a a highest and best use analysis to evaluate potential uses based on specific criteria on an ordinal scale of -2 to +2. A score of -2 reflects incompatibility, +2 shows ideal suitability, and 0 represents neutrality. The total score for each land use are tallied and ranked numerically, with the highest score indicating the best use.

The proposed uses were selected from the 2017 Glenville Master Plan and the community survey. The uses were Affordable Single-Family Housing, Restaurant, Office, Local Retail, Affordable Apartments, Parking Lot, and Auto Repair School. The evaluative criteria used were lot size, zoning, proximate land use, visibility, traffic counts, walkability, competition, and community objectives. Please see the complete analysis in the Appendix for more information.

Based on our analysis, the proposed use with the highest score is Local Retail at 12 total points. Affordable Apartments and Affordable Single-Family finished second and third, respectively, with 11 points and 10 points. With local retail needs already emphasized in prior plans, potential uses should be small retail options lacking in the market area, such as community hardware and garden center, local eateries, laundromat, and other community space.



Figure 93: Street view of proposed development site Source: Google Maps

Proposed Buildout and Cost

If the city rezones the parcel to General Retail Business ("GR"), a new local retail development could take advantage of the site's size and location to the park and Dugway Brook. To avoid obstructing views and decreasing connectivity, the building should have a far setback from Saint Claire Avenue and not exceed two stories. We recommend only building a one-story structure on half of the site footprint, including off-street parking. The proposed structure would have approximately 10,000 square feet of floor space and 30 parking spaces across 8,100 square feet of parking space, which will require receiving an area variance from the city planning department. The remaining 22,410sq. ft will be dedicated to landscaping, preventing the structure from encroaching on the park.

Project costs are estimated with the following assumptions:

- \$150 per sq. Ft to construct the building
- \$4,000 to install each parking space
- 20% of hard construction costs for planning, engineering, and legal

With these assumptions, the total cost to build the proposed project is \$1,944,000.

Redevelopment Potential Financing

Based on the proposed development above, the projected total costs for the project are \$1.94 million. Given local market factors, high construction and labor costs present a major challenge to build. Even then, the proposed tenant mix will likely need discounted leases and other financial incentives to adequately absorb the space. Stabilized cash flow will have difficulty meeting investor minimum returns without substantial public subsidy.

Public subsidies might not be enough. The site is located just outside of the nearest Opportunity Zone, which only includes the southern side of Saint Claire Avenue. Opportunity Zones are investment vehicles that allow private equity in real estate projects to defer capital gains taxes realized from prior investments. No Opportunity Zone access is a major impediment to redevelopment.

Funding sources should be leveraged from community anchors, including medical centers, educational institutions, and civic foundations. Funding assistance, either capital or in-kind services, can help seed the project and lend operational stability.

> Explore Opportunities to Develop Small Business Along the St. Clair and E. 105th St. Corridors

Reinvest in Shopping, Dining, and Grocery Options in Glenville

Retail Market Analysis

One of the goals of daylighting the Dugway Brook is to generate new opportunities that contribute to overall community development. Some opportunities include developing small businesses and providing more community services to residents.

To examine the local market, we performed a retail market analysis that examined a market comprised of 5, 10 and 15 minute walksheds around the center of Glenview Park. The 5-minute walkshed has a population of 523, 223 households and 139 family units. The

10-minute walkshed has a population of 2,137, 945 households, and 562 family units. The 15-minute walkshed has a population of 5,024, 2,773 households and 1,253 family units (ESRI Business Analyst, 2022 estimate).

Given the residential surrounds of the park, most retail uses exist beyond a 10-minute walkshed from the park. The greater market area offers a mix of uses, with mainly the majority being Miscellaneous Retail (specialized merchandising) and Eating and Drinking Places. The most significant retail offering in the greater area is The New Eastside Market, a grocery store located at the corner of St.



Figure 94: 5, 10, and 15 minute walksheds around Glenview Park Source: ESRI Business Analyst

Clair Avenue and East 105th Street. The store opened in 2019 to combat the area's decades-long food desert and offers full-service groceries, with plans to add a community wellness center.

Retail Market Potential

Projecting over a 5-year period, household spending was examined across various retail segments. The table below displays the results. The retail segments with the highest projected growth are Food, Home, and Entertainment & Recreation. The Food segment includes groceries, restaurants and convenience stores and alcohol sales. The Home segment includes mortgage payments, utilities, fuel, public services and maintenance and remolding services. Within the Entertainment & Recreation segment, the most popular sub-segments include Fees and Admissions, Television Services and Pets.

Overall, the household spending analysis demonstrates how most of the area spending covers basic household needs.

The 2017 Glenville Master Plan identified community-serving retail opportunities. The plan specifically listed potential uses as drycleaners, laundromats, optical store, medical equipment store, hardware, garden center, auto parts, florists, and gift shops. The plan also identified an auto repair training center or institution back office.

Retail by SIC Code	5-min	10-min	15-min
Home Improvement	0	0	0
General Merchandise Stores	0	1	3
Food Stores	0	2	3
Auto Dealers, Gas Stations, Auto Aftermarket	0	0	2
Apparel & Accessory Stores	0	1	2
Furniture & Home Furnishings	0	0	2
Eating & Drinking Places	0	1	4
Miscellaneous Retail	1	2	5
Total	1	7	21

Figure 95: Retail by SIC Code Source: Data Axle, 2022

IMPLEMENTATION FRAMEWORK

Partner Organizations

Inventory of Community Stakeholders:

- Local Citizens, Residents and Homeowners
- Local Businesses and/or Business Owners
- Local Block and Street Clubs
- Local Community Leaders
- Local Banks and other Financial Institutions
- Local Neighborhood Organizations and Associations
- Local Public Libraries
- Local Public-School Districts and Non-Public School Systems
- Local Special Interest Agencies and/or Groups
- General Community Members from
 Interconnecting Neighborhoods

Inventory of Project Partners:

- Chagrin River Watershed Partners, Inc.
- City of Cleveland
- Cleveland Metropolitan School District
- Cleveland Neighborhood Progress
- Bluestone Conservation
- Doan Brook Watershed Partnership
- Northeast Ohio Regional Sewer District
- Village of Bratenahl

Business & Government Funding Sources

Alliance for Community Trees (ACTrees) Mission: ACTrees supports grassroots citizenbased nonprofit organizations dedicated to urban and community tree planting, care, conservation, and education.

Bank of America Charitable Foundation

Economic mobility focused on needs of the community such as affordable housing, small business resiliency, and neighborhood revitalization.

City of Cleveland Job Creation Grant

The Job Creation Incentive Program (JCIP) is utilized to attract or retain businesses in the City of Cleveland. The grant amount paid is based on actual new payroll and income tax generated to the city.

City of Cleveland Storefront Renovation Program (SRP)

The City of Cleveland's Storefront Renovation Program helps neighborhood retail districts become more attractive, economically viable, and diverse places to visit and shop by assisting in the design and funding of signage and the rehabilitation of traditional storefront buildings.

Green Infrastructure Technical Assistance Program (EPA)

The EPA Green Infrastructure in Parks: A Guide to Collaboration, Funding, and Community Engagement.

HUD Federal (CDBG) Funds

Community Development Block Grant Funds Program: provides annual grants on a formula basis to states, cities, and counties to develop viable urban communities by providing decent housing and a suitable living environment, and by expanding economic opportunities, principally for low-and-moderate income areas.

Micro-enterprise Funds

The Ohio Micro-Loan Program is designed to stimulate the growth of new and existing

businesses by providing micro-loans at 0% interest. Rural Microentrepreneur Assistance Program grants are available to provide technical assistance to microenterprises.

PNC Foundation Grants

The PNC Foundation supports nonprofit organizations that serve low and moderateincome neighborhoods by improving living and working conditions. Support is given to organizations that help stabilize communities, eliminate blight, and attract and retain businesses and residents to the community through Economic Development, Community Development and the revitalization & stabilization of low-and moderate-income areas

Safe Routes to School (SRTS) Grant Program

Funding from The Ohio Department of Transportation (ODOT)

Nonprofit Organizational Funding Sources

Neighborhood Connections Neighbor Up Action Grants

Neighbor Up Action Grants fuel the power of neighbors to make the change they want to see in their communities. These grants are meant to spur small grassroots community projects throughout the Cleveland and East Cleveland areas. One example for using the grant is the topic of City Repair, which includes initiatives for land reuse and design of a vacant space or park area.

Neighborhood Stabilization Initiative (NSI) Jointly developed by the Federal Housing Finance Agency (FHFA) and Fannie Mae and Freddie Mac to stabilize neighborhoods hardest hit by the housing downturn and to reduce real estate owned properties held by Fannie mac and Freddie Mac. This initiative has been expanded to include the State of Ohio.

Ohio EPA Targeted Brownfields Assessments Services

The Ohio Brownfields section administers two brownfield assistance programs, the Targeted Brownfield Assessment Program and teh Technical Assistance Program. Both assist local governments entities with their goal of transforming blighted properties into economic and community assets. Capitalized by a grant from USEPA, the brownfield assistance programs target community driven projects in need of property assessment and technical assistance. Eligible applicants include local government entities such as counties, cities, villages, townships, port authorities and county land banks.

Safe Routes to School

The Safe Routes to School program provide funding to facilitate the planning, development and implementation of projects and activities that enable and encourage K-12 students, including those with disabilities, to walk or bike to school.

United States Department of Agriculture

Urban Agriculture and Innovation Production (UAIP) competitive grants initiate or expand efforts of farmers, gardeners, citizens, government officials, schools, and other stakeholders in urban areas and suburbs. Projects target areas of food access; education; business and start-up costs for new farmers; and development of policies related to zoning and other needs of urban production.

US EPA Brownfields Assessment Grant: United States Environmental Protection Agency

Brownfields Assessment Grants provide funding for a grant recipient to inventory, characterize, assess, conduct a range of planning activities, develop site-specific cleanup plans, and conduct community engagement related to determining brownfield sites.

Implementation Recommendations

Recommendations	Time Frame		
Community Engagement			
Develop stipend-based stewardship programs for resident living adjacent to Glenview Park	Medium-Term		
Partner with local educational institutions to increase community engagement and programming in Glenview Park to strengthen youth and adult connections to nature	Short-Term		
Foster community partnerships with local leaders to support community events in and around Glenview Park	Short-Term		
Develop a complete two-year public outreach plan that supports the Dugway Brook project and incorporates the communities of Glenville, the Village of Bratenahl, and other neighboring areas	Short-Term		
Develop a long-term community engagement plan through a partnership with local community engagement leaders, non-profit organizations, property developers, and financial institutions	Long-Term		
Community Development			
Build on existing neighborhood characteristics to develop new forms of placemaking through street façade improvements and park improvements	Short-Term and Long-Term		
Establish community wellness programs through partnerships with local recreational and health institutions	Medium-Term		
Identify and pursue opportunities to build more affordable housing for seniors, working adults, and families in areas lacking access	Long-Term		
Identify most important characteristics of existing communities to ensure these facets are not lost in the creation of growth opportunities	Short-Term to Long-Term		
Evaluate and develop rehabilitation plans for properties at and below code standards	Medium-Term		
Connectivity			
Develop trail plan with the Cuyahoga County Planning Commission	Medium-Term		
Utilize input from community members to serve underrepresented sections of Glenville and neighboring communities via new trail connections	Long-Term		
Incorporate Dugway Greenway into the Cuyahoga Greenway Plan, pursue regional funding opportunities for Cuyahoga Greenways projects	Long-Term		
Ensure that Glenville and Bratenahl community members are represented in upcoming planning for the Cleveland Harbor Eastern Embayment Resilience Strategy (CHEERS) and facilitate connections for lakefront access	Long-Term		

Implement a system of multi-use trails, bike, land, sidewalk improvements, and neighborhood greenways to create a Dugway Greenway that create links to Martin Luther King Jr. Park, Forest Hill Park, Pattison Park, Cleveland Lakefront Bikeway, Rockefeller Park, and the Cleveland Lakefront Nature Preserve	Long-Term			
Develop a local connectivity plan in Glenview to ensure connectivity between the Dugway Greenway and the larger Cuyahoga Greenways	Medium-Term			
Ecology				
Grow and strengthen Glenville and the Village of Bratenahl's urban tree canopy coverage through the adoption of a comprehensive tree plan to identify priority areas	Long-Term			
Improve the ecological health of the Dugway Estuary in the Village of Bratenahl by softening edges, reducing imperviousness, and improving the upstream water quality	Long-Term			
Incorporate green infrastructure such as bioswales, urban tree canopy, rain gardens, infiltration basins, stormwater green streets, permeable paving, and other environment amenities in final site plan for Dugway Brook	Medium-Term			
Partner with local environmental organizations and area science teachers to create educational curriculum that can be implemented at neighboring schools	Medium-Term			
Coordinate with local Audubon and gardening chapters to identify locations for bird migratory habitat and plant appropriate native plants to support ecosystems surrounding the daylighted stream	Medium-Term			
Reduce urban heat island in Glenview neighborhood through increasing the tree canopy, utilizing green roof technology, and building new water structures in the neighborhood	Long-Term			
Reinvestment				
Evaluate and develop rehabilitation plans for properties listed at grades "C" and "D" in the Glenville neighborhood through the promotion of Community Reinvestment Area tax abatement	Medium-Term			
Explore the opportunities to develop small businesses along St. Clair Ave and E 105th St. near the park space improvements	Medium-Term			
Create plan to position future development to support sustainable economic development	Medium-Term			
Reinvest in local shopping, dining and grocery options in along the St. Clair retail corridor in Glenville	Long-Term			
Identify and increase transit oriented development along the St. Clair corridor	Long-Term			
Stimulate economic recovery through new affordable homebuilding	Long-Term			
Identify and invite redevelopment of abandoned disused parcels in area adjacent to Glenview Park	Long-Term			

PLANNING TEAM BIBLIOGRAPHY APPENDICES

CAPSTONE STUDIOS



Dr. Thomas Hilde Principal, Planning Director



Professor James Kastelic Principal, Planning Director



Alex Iarocci Development Team



Anna Mates Design Team



Sophia Jones Design Team



Pamela McClarin Community Engagement Manager



Michael O'Malley Design Team



Hinal Sorathiya Design Team



Kay-Lee Willard Design Team



Fardeen Rafiq Development Team



Phillip Studmire Development Team



Lauren Williams Community Outreach Manager

BIBLIOGRAPHY

Advancing Park Equity in Cleveland - Trust for Public Land. (2022, November 7). Trust for Public Land. https://www.tpl.org/our-work/advancing-park-equity-cleveland

ACEC Ohio. (2022, March 16). 2022 Engineering Excellence Awards. 674392. Retrieved March 8, 2023, from http://acecohio.org/aws/ACEC/ asset_manager/get_file/674392?ver=0

American Rivers (n.d.). Daylighting Streams: Breathing Life into Urban Streams and Communities. Retrieved March 7, 2022, from, https:// www.americanrivers.org/resource/daylighting-streams-breathing-life-urban-streams-communities/

Bain, D. J., Copeland, E. M., Divers, M. T., Hecht, M., Hopkins, K. G., Hynicka, J., Koryak, M., Kostalos, M., Brown, L., Elliott, E. M., Fedor, J., Gregorich, M., Porter, B., Smith, B., Tracey, C., & Zak, M. (2014). Characterizing a Major Urban Stream Restoration Project: Nine Mile Run (Pittsburgh, Pennsylvania, USA). Journal of the American Water Resources Association, 50(6), 1608-1621. https://doi.org/10.1111/jawr.12225

Balanced Growth Program. (2013, December 16). Case Studies: Storm Water Management Lick Run Project . Lick+Run_rgb_small. pdf. Retrieved March 8, 2023, from https:// balancedgrowth.ohio.gov/wps/wcm/connect/ gov/2c6e7b0a-1503-48a0-a245-35d99a64e07f/ Lick+Run_rgb_small.pdf?MOD=AJPERES&-CONVERT_TO=url&CACHEID=-ROOTWORKSPACE.Z18_M1HGGIK0N0JO-00QO9DDDDM3000-2c6e7b0a-1503-48a0-a245 -35d99a64e07f-o46CCyy

Beach, D. (2007). Dugway Brook. Archived,

http://.gcbl.org/water/rivers/dugway-brook Cross, D. A., & Chappell, J. C. (2022). Highlighting assumptions of community engagement in urban stream restoration. Freshwater Science, 41(3), 532-538. https://doi.org/10.1086/721540

Biohabitats, Inc. (2013, July 18). Nine Mile Run Aquatic Ecosystem Restoration. NineMileRun_04701-1.pdf. Retrieved March 9, 2023, from https://www.biohabitats.com/ wp-content/uploads/NineMileRun_04701-1.pdf

Beaulieu, J. J., Mayer, P. M., Kaushal, S. S., Pennino, M. J., Arango, C. P., Balz, D. A., ... & Domingo, J. W. S. (2014). Effects of urban stream burial on organic matter dynamics and reach scale nitrate retention. Biogeochemistry, 121, 107-126

Brasuell, J. (2019, October 21). The gentrification effect of Urban parks. Planetizen News. Retrieved March 8, 2023, from https://www. planetizen.com/news/2019/10/106784-gentrification-effect-urban-parks#:~:text=Long%20 linear%20parks%2C%20like%20the,from%20 222%20to%20236%20percent

Bratenahl Historical Society. (2019). Schools. Retrieved February 20, 2023, from https://bratenahlhistorical.org/index.php/schools/

Bratenahl Historical Society. (2019). About Bratenahl Historical Society. Retrieved March 5, 2023, from https://bratenahlhistorical.org/ index.php/about/

Bratenahl Historical Society. (2021, June 17). The history of BRATENAHL, Ohio. Retrieved March 4, 2023, from https://bratenahlhistorical. org/index.php/history/ Bratenahl Historical Society. (2022, August 24). Early Settlers Glenville Village 1870 to 1904. Retrieved March 4, 2023, from https://bratenahlhistorical.org/index.php/glenville/#:~:text=-Glenville%20was%20established%20on%20November,the%20area%20its%20picturesque%20 name

Breakthrough Public Schools. (2023). Explore Our Schools. Retrieved March 5, 2023, from https://breakthroughschools.org/schools/

Brightside Academy Ohio. (2020). Brightside Academy Ohio Child Care in St. Clair Cleveland, OH. Retrieved March 5, 2023, from https:// brightsideohio.com/cleveland/st-clair/

Buchholz, T. A., Madary, D. A., Bork, D., & Younos, T. (2016). Stream restoration in urban environments: concept, design principles, and case studies of stream daylighting. Sustainable Water Management in Urban Environments, 121-165. Retrieved March 7, 2022, from, https://doi.org/10.1007/978-3-319-29337-0_5

Buchholz, T., & Younos, T. M. (2007). Urban stream daylighting: case study evaluations. Retrieved March 7, 2022, from, https:// vtechworks.lib.vt.edu/bitstream/handle/10919/49482/VWRRC_sr200735.pdf

Busta-Peck, C. (2010, May 5). Forest Hill Parkway Elementary School. Flickr. Retrieved April 18, 2023, from https://www.flickr.com/photos/ cbustapeck/4581501441

Case Western Reserve University Encyclopedia of Cleveland History. (2020, December 8). Dugway Brook. Retrieved March 4, 2023, from https://case.edu/ech/articles/d/ dugway-brook#:~:text=Between%201908%20 and%202002%2C%20Dugway,beneath%20 Cleveland%E2%80%99s%20roads%20and%20 trails

Case Western Reserve University Encyclope-

dia of Cleveland History. (2022, February 25). Bratenahl. Retrieved March 4, 2023, from https://case.edu/ech/articles/b/bratenahl

Case Western Reserve University Encyclopedia of Cleveland History. (2022, March 12). Glenville. Retrieved March 4, 2023, from https:// case.edu/ech/articles/g/glenville

Centers for Disease Control and Prevention. (2011, June). Principles of Community Engagement. https://www.atsdr.cdc.gov/communityengagement/pdf/PCE_Report_508_FINAL.pdf

Center for Watershed Protection. (2015, July 31). Urban Tree Canopy. https://cwp.org/urban-tree-canopy/

CHAPTER 337 - RESIDENTIAL DISTRICTS. (n.d.). American Legal Publishing. https://codelibrary. amlegal.com/codes/cleveland/latest/cleveland_ oh/0-0-0-13242#JD_Chapter337

Citizens for a Better Flathead (September 2007). Streamside Setbacks Increase Property Values and Attract Economic Development. Retrieved March 7, 2022, from, https://groundtruthalaska.org/static/uploads/files/BuffersPropertyValues%5B1%5D.pdfeL5c5U/BuffersPropertyValues%5B1%5D.pdf

City of Cleveland. (n.d.) Parks & Playgrounds. Retrieved February 12, 2023, from https:// clevelandgis.maps.arcgis.com/apps/webappviewer/index.html?id=7f79c81c575f425eb9c-04dc0d3ea641e

City of Cleveland. (n.d.) Recreation Centers. Retrieved March 5, 2023, from https://www. clevelandohio.gov/CityofCleveland/Home/Community/ThingsToDo/RecreationCenters City of Cleveland. (2018). City of Cleveland Park & Recreation Facilities Master Matrix. Retrieved March 5, 2023, from https://www.clevelandohio.gov/sites/default/files/forms_publica-

tions/2018CityParks.pdf

Cleveland City Planning. (2014, January 17). Glenville - Cleveland. Glenville.pdf. Retrieved March 9, 2023, from https://planning.clevelandohio.gov/2010census/downloads/Glenville. pdf

Cleveland City Planning Commission. (2016). myGlenville Neighborhood Revitalization Master Plan. https://planning.clevelandohio.gov/ gis2015/2020%20small%20area%20plans/ St.%20Clair%20Superior/2017-07-07%20-%20 MyGlenville%20MasterPlan%20-%20CPC%20 -%20final_email.pdf

Cleveland City Planning Commission. (n.d.). Safe Routes to School. Retrieved February 20, 2023, from https://planning.clevelandohio.gov/SRTS/ maps.php

Cleveland Metroparks. (2014, May). Acacia Reservation Ecological Restoration Master Plan. https://www.clevelandmetroparks.com/getmedia/a177cbd8-4570-4c1a-b48b-f4241e9ca25b/ Acacia-Full-Report-050814-Biohabitats_compressed.pdf.ashx#:~:text=This%20Ecological%20 Restoration%20Master%20Plan,opportunity%20to%20reconnect%20with%20nature

Cleveland Metroparks. (2022, August 31). Cleveland Metroparks Acacia reservation marks a decade of transformation. Cleveland Metroparks Acacia Reservation Marks a Decade of Transformation | Cleveland Metroparks. Retrieved March 8, 2023, from https://www. clevelandmetroparks.com/news-press/2022/ august-2022/cleveland-metroparks-acacia-reservation-marks-a-de

Cleveland GIS. (n.d.). Maps, Apps, Initiatives. Retrieved March 6, 2023, from https://clevelandgis.maps.arcgis.com/apps/webappviewer/ index.html?id=5cd6bf3491c1493084e1090cbd03e2c4 Cleveland Metropolitan School District. (2023). School Locator Map. Retrieved February 20, 2023, from https://www.clevelandmetroschools.org/school-locations-map

Cleveland Metroparks. (2014, May). Acacia Reservation Ecological Restoration Master Plan. https://www.clevelandmetroparks.com/getmedia/a177cbd8-4570-4c1a-b48b-f4241e9ca25b/ Acacia-Full-Report-050814-Biohabitats_compressed.pdf.ashx#:~:text=This%20Ecological%20 Restoration%20Master%20Plan,opportunity%20to%20reconnect%20with%20nature

Cleveland Metroparks. (2022, August 31). Cleveland Metroparks Acacia reservation marks a decade of transformation. Cleveland Metroparks Acacia Reservation Marks a Decade of Transformation | Cleveland Metroparks. Retrieved March 8, 2023, from https://www. clevelandmetroparks.com/news-press/2022/ august-2022/cleveland-metroparks-acacia-reservation-marks-a-de

Cleveland Public Library. (2023). Glenville. Retrieved March 5, 2023, from https://cpl.org/ locations/glenville/

Courtney Astolfi, cleveland.com. (2022, August 22). Cleveland to develop master plan for city parks, recreation centers. Cleveland. https://www.cleveland.com/news/2022/08/cleveland-to-develop-master-plan-for-city-parks-recreation-centers.html

Communities United For Action. (2021, May 10). Consent decree 101: The Court case to fix our sewers. Consent_Decree_101.pdf. Retrieved March 9, 2023, from https://d3n8a8pro7vhmx. cloudfront.net/communitiesunitedforaction/ pages/381/attachments/original/1620659847/ Consent_Decree_101.pdf?1620659847

Coolidge, S. (2011, June 12). S. Fairmount's Lick Run creek may flow again. Cinci_Enquirer_6-12-11.pdf. Retrieved March 8, 2023, from https://www.projectgroundwork.org/downloads/lickrun/More/Cinci_Enquirer_6-12-11.pdf

Cross, D. A., & Chappell, J. C. (2022). Highlighting assumptions of community engagement in urban stream restoration. Freshwater Science, 41(3), 532-538. https://doi.org/10.1086/721540

Cuyahoga County Planning Commission. (n.d.) Cuyahoga Greenways. https://www.countyplanning.us/projects/cuyahoga-greenways/

Derr, V. & Lance, K. (2012). Biophilic Boulder: Children's Environments That Foster Connections to Nature. Children, Youth and Environments, 22(2), 112–143. https://doi. org/10.7721/chilyoutenvi.22.2.0112

Dinnie, E., Brown, K. M., & Morris, S. (2013). Reprint of "Community, cooperation and conflict: Negotiating the social well-being benefits of urban greenspace experiences". Landscape and urban planning, 118, 103-111.

ECRR (2019). Healthy rivers provide a quality environment. Retrieved March 7, 2022, from, https://www.ecrr.org/River-Restoration/Social-benefits-of-river-restoration

Ellington, T. N., Underwood, J. L., & Rogers, S. J. (2020). TEXTURES: the history and art of Black hair. The KSU Museum.

EPA (2023). Environmental Justice. Retrieved May 8, 2023, from, https://www.epa.gov/environmentaljustice

Famicos Foundation. (n.d.). Services. Retrieved February 26, 2023, from https://famicos.org/ social-services

Famicos Foundation. (n.d.-a). Community Health & Wellness. Retrieved February 26, 2023, from https://famicos.org/health-wellness Forest Research. (2023). Urban green networks, corridors and linkages. Retrieved from https://www.forestresearch.gov.uk/tools-and-re-sources/fthr/urban-regeneration-and-green-space-partnership/greenspace-in-practice/planning-integrated-landscapes/urban-green-networks-corridors-and-linkages/

Frolik, J. (2019, March 20). Acacia: From Elite Golf Course to public greenspace. Ideastream Public Media. Retrieved March 8, 2023, from https://www.ideastream.org/news/acaciafrom-elite-golf-course-to-public-greenspace

Glenville's Racial Transition, & "The Jewish Migration, 1961" appears in: G. R. T. (n.d.). The Jewish migration, 1961. Cleveland Historical. Retrieved March 4, 2023, from https://clevelandhistorical.org/files/show/6212

Grieser, J. (2016, October 6). Cuyahoga Soil & Water Conservation District. Cuyahoga Soil and Water Consvervation District. Retrieved March 6, 2023, from https://www.cuyahogaswcd.org/files/assets/ecwatershedsummitpresentationcmpacacia100616.pdf

Grieser, J. (2018, February). Acacia restoration activities - clevelandmetroparks.com. Power-Point Presentation. Retrieved March 8, 2023, from https://www.clevelandmetroparks. com/getmedia/979984a5-818a-4d84-adb0-4268b0586d22/Acacia_Restoration_Update. pdf.ashx

Grieser, J. (2018, May). IERQC archived webinars: Jennifer Grieser (May 2018). Society for Ecological Restoration. Retrieved March 8, 2023, from https://www.ser.org/news/news. asp?id=451530

Harnik, P. (2007). NINE MILE RERUN. Landscape Architecture, 97(11), 62–71. http://www.jstor. org/stable/44677629 Hausman, C. E. (2013, September 9). Cleveland metroparks: Bioblitz at Acacia Reservation. Microsoft Word - Acacia bioblitz_Fall summary. Retrieved March 8, 2023, from https://www. clevelandmetroparks.com/getmedia/aa82f159f670-4405-a93f-b2a9b7477da9/Acacia-Bioblitz_ Fall-2013.pdf.ashx

Hillman, M. (2004). The importance of environmental justice in stream rehabilitation. Ethics, Place and Environment, 7(1-2), 19-43.

Hoehne, S., & amp; Grieser, J. (2018, May). Cuyahoga Soil & amp; Water Conservation District. Cuyahoga Soil and Water Consvervation District. Retrieved March 8, 2023, from https:// ohstormwaterconference.com/wp-content/uploads/2018-presentations/J-Grieser-T2C.pdf

J. Mark Southern & Chris Roy. Dugway Brook. (2011). Cleveland Historical. https://clevelandhistorical.org/items/show/546

James Ewinger, T. P. D. (2016, December 17). Moving Earth for a bit of heaven as acacia returns to nature. Cleveland. Retrieved March 8, 2023, from https://www.cleveland.com/ metro/2016/12/cleveland_metroparks_moving_earth.html

James Ewinger, T. P. D. (2016, December 17). Moving Earth for a bit of heaven as acacia returns to nature. Cleveland.com Retrieved March 8, 2023, from https://www.cleveland.com/ metro/2016/12/cleveland_metroparks_moving_earth.html

Jickells, T. D., Andrews, J. E., Parkes, D. J., Suratman, S., Aziz, A. A., & Hee, Y. Y. (2014). Nutrient transport through estuaries: The importance of the estuarine geography. Estuarine, Coastal and Shelf Science, 150, 215-229

Jordan, K. E. (2016, June 8). OhioLINK electronic theses and dissertations. OhioLINK. Retrieved

March 8, 2023, from https://www.ohiolink.edu/ content/ohiolink_electronic_theses_and_dissertations

Khirfan, L., Mohtat, N., & Peck, M. (2020). A systematic literature review and content analysis combination to "shed some light" on stream daylighting (Deculverting). Water Security, 10, 100067. https://doi.org/10.1016/j. wasec.2020.100067

Kresge Foundation. (2017, May 3). Case study: Lick run watershed, Cincinnati, Ohio. NRC_CaseStudies_Cincinnati_OH.pdf. Retrieved March 9, 2023, from https://nrcsolutions.org/wp-content/uploads/2017/05/NRC_CaseStudies_Cincinnati_OH.pdf

Leila Atassi & amp; Andrew Tobias, cleveland. com. (2014, March 4). Regional sewer district chooses costly tunnels over 'green' infrastructure, though vacant land abounds in Cleveland. Regional sewer district chooses costly tunnels over 'green' infrastructure, though vacant land abounds in Cleveland - cleveland.com. Retrieved March 9, 2023, from https://www. cleveland.com/drain/2014/03/regional_sewer_district_plans.html

LeMay, W. (2018, June 3). Lake View Cemetery Dam, Cleveland Heights, OH. Flickr. Retrieved March 6, 2023, from https://www.flickr.com/ photos/warrenlemay/41823511144

Lenhart, C., & Smiley, P. C. (Eds.). (2018). Ecological Restoration in the Midwest: Past, Present, and Future. University of Iowa Press. https:// doi.org/10.2307/j.ctv19x59r

Mark, J. and Roy, C. (2011). Dugway Brook. Cleveland Historical Stories https://clevelandhistorical.org/items/show/546

Meenar, M., Fromuth, R., & Soro, M. (2018). Planning for watershed-wide flood-mitigation and stormwater management using an environmental justice framework. Environmental Practice, 20(2-3), 55-67. https://doi.org/10.108 0/14660466.2018.1507366

Metropolitan Sewer District of Greater Cincinnati. (2012, July 23). Lower Mill Creek Partial Remedy Alternatives Evaluation Preliminary Findings Report. LMCPR_Report_Summary.pdf. Retrieved March 8, 2023, from https://www. projectgroundwork.org/downloads/lowermillcreek/LMCPR_Report_Summary.pdf

Metropolitan Sewer District of Greater Cincinnati. (2012, September 26). Lower Mill Creek Partial Remedy MSD's Recommendation to the CoDefendants of LMCPR Alternative. MSD Recommendation of LMCPR Alternative. Retrieved March 8, 2023, from https://www.projectgroundwork.org/downloads/reports/lmcpr_recommendation_final_report_26sep2012.pdf

Metropolitan Sewer District of Greater Cincinnati. (2012, September 26). Lower Mill Creek Partial Remedy Hamilton County Board of County Commissioners Public Hearing . Power-Point Presentation. Retrieved March 8, 2023, from https://www.projectgroundwork.org/ downloads/reports/Imcpr_county_public_hearing-26sep12_final_version.pdf

Metropolitan Sewer District of Greater Cincinnati. (2021, November 19). Budget & amp; Rate Information. Metropolitan Sewer District of Greater Cincinnati. Retrieved March 8, 2023, from https://www.msdgc.org/About_msd/Audits_Budgets_More/budget/index.html

Metropolitan Sewer District of Greater Cincinnati. (2021). Green infrastructure reinvigorates underserved neighborhood - the atlas. Green Infrastructure Reinvigorates Underserved Neighborhood. Retrieved May 9, 2023, from https://the-atlas.com/projects/using-largescale-green-solutions-to-reduce-overflows-andreinvigorate-a-neighborhood-1698

Moran, S. (2010). Cities, creeks, and erasure: Stream restoration and environmental justice. Environmental justice, 3(2), 61-69

Murtis Taylor Human Services System. (2023). Who We Are. Retrieved March 5, 2023, from https://www.murtistaylor.org/

Napieralski, J., Keeling, R., Dziekan, M., Rhodes, C., Kelly, A., & Kobberstad, K. (2015). Urban Stream Deserts as a Consequence of Excess Stream Burial in Urban Watersheds. Annals of the Association of American Geographers, 105(4), 649–664. http://www.jstor.org/stable/24537862

National Fish and Wildlife Foundation. (2022). National Costal Resilience Fund Full Proposal.

National Fish and Wildlife Foundation. (2022). Engaging Dugway Brook Communities in Designing Steam and Wetland Restoration (OH).

Naturally Resilient Communities (n.d.). Daylighting Rivers and Streams. Retrieved March 7, 2022, from, https://nrcsolutions.org/daylighting-rivers/

Natural Resources Defense Council (NRDC). (25 July 2022). Green Infrastructure: How to Manage Water in a Sustainable Way. Retrieved from Green Infrastructure: How to Manage Water in a Sustainable Way (nrdc.org)

Natural Resources Defense Council (NRDC). (25 July 2022). Green Infrastructure: How to Manage Water in a Sustainable Way. NRDC. https://www.nrdc.org/stories/green-infrastructure-how-manage-water-sustainable-way#whatis

Neale, M. W., & Moffett, E. R. (2016). Re-engineering buried urban streams: Daylighting results in rapid changes in stream invertebrate communities. Ecological Engineering, 87, 175-184. Retrieved March 7, 2022, from, https:// doi.org/10.1016/j.ecoleng.2015.11.043

Nine Mile Run Watershed Association. (2016, November 23). A report card for the community - UPSTREAMPGH. 2016-NineMile_Report-Card_final.pdf. Retrieved March 9, 2023, from https://upstreampgh.org/wp-content/ uploads/2021/03/2016-NineMile_Report-Card_final.pdf

North Coast Journal Weekly (2003). a new paradigm. The ERTS program and local high schools. Retrieved March 7, 2022, from, https://www. northcoastjournal.com/052203/cover0522.html

Northeast Ohio Regional Sewer District. (2018, March 23). Bored to depth, light at the end of the tunnel marks the end of a journey. Retrieved from https://neorsd.medium.com/ bored-to-depth-light-at-the-end-of-the-tunnelmarks-the-end-of-a-journey-8a3096b56e18

Pennino, M. J., Kaushal, S. S., Beaulieu, J. J., Mayer, P. M., & Arango, C. P. (2014). Effects of urban stream burial on nitrogen uptake and ecosystem metabolism: implications for watershed nitrogen and carbon fluxes. Biogeochemistry, 121, 247–269. http://www.jstor.org/ stable/24717577

Pinkham, R. (2001). 3 rivers 2nd nature. Stream Restoration and Daylighting: Opportunities in the Pittsburgh Region. Retrieved March 9, 2023, from https://3r2n.collinsandgoto.com/revalued/stream-restoration-daylighting/ Polletta, D. (2022, December 1). Documenting how acacia golf course became a green space. Ideastream Public Media. Retrieved March 8, 2023, from https://www.ideastream.org// news/documenting-how-acacia-golf-course-became-a-green-space Plummer, R.; Smits, A.; Witkowski, S.; McGlynn, B.; Armitage, D.; Muhl, E-K.; and Johnston, J. (2022). Building Sustainable Communities: The Impact of Engagement. Creative Commons Attribution 4.0 International License. PB: Pressbooks. Building Sustainable Communities: The Impact of Engagement – Simple Book Publishing (pressbooks.pub)

Pradhananga, A., Davenport, M., & Green, E. (2019). Cultural narratives on constraints to community engagement in urban water restoration. Journal of Contemporary Water Research & Education, 166(1), 79-94. Retrieved, May 8, 2023, from, https://doi.org/10.1111/ j.1936-704X.2019.03303.x

Project Groundwork. (2017, July 19). Lick Run Faqs - Project Groundwork. Lick_Run_FAQs_ July_2017.pdf. Retrieved March 9, 2023, from http://www.projectgroundwork.org/downloads/lickrun/Lick%20Run%20FAQs_Fact%20 Sheet_January_2017.pdf

Project Groundwork. (2021). Trail location 16: Public infrastructure in south fairmount. Heritage Trail: Location 16. Retrieved March 8, 2023, from https://projectgroundwork.org/ projects/lowermillcreek/sustainable/lickrun/ alternative/HT_Loc_16_Public_Infrastructure. htm#trail_location_K

Red Horse Environmental. (2017, January 4). Nine mile run stream restoration - redhorseenvironmental.com. Nine-Mile-Run-Stream-Restoration-1.pdf. Retrieved March 9, 2023, from https://www.redhorseenvironmental.com/ wp-content/uploads/2021/02/Nine-Mile-Run-Stream-Restoration-1.pdf

Rose, C. (2021, February 25). Lick Run finally comes back to the surface. Cincinnati Magazine. Retrieved March 8, 2023, from https://www. cincinnatimagazine.com/article/lick-run-finallycomes-back-to-the-surface/
Rose, C. (2021, January 18). The Genius of Water. Cincinnati Magazine - February 2021 Edition by Cincinnati Magazine - Issuu. Retrieved March 8, 2023, from https://issuu.com/cincinnatimagazine/docs/february_2021

RTA. (2012). System Maps. Retrieved February 6, 2023, from https://www.riderta.com/systemmap

Rudder, J. (2019, April 26). Hidden gem: Lake View Cemetery has a secret, and it's dam good. News 5 Cleveland WEWS. Retrieved March 4, 2023, from https://www.news5cleveland.com/ news/local-news/hidden-gem-lake-view-cemetery-has-a-secret-and-its-dam-good

Salt Lake City Parks. (n.d.). Salt Lake City Parks, Open Space, and Trail Signage Guidelines. http://www.slcdocs.com/parks/Salt%20 Lake%20City%20PL%20Signage%20Guidelines. pdf

Scoggins, M., Booth, D.B., Fletcher, T., Fork, M., Gonzalez, A., Hale, R.I. (2022). Community-powered urban stream restoration: A vision for sustainable urban ecosystems. Freshwater Science, 41(3), 404-419.

Sinclair, C. (2012). An exploration of stream daylighting and urban attitudes towards the environment. Trail Six: An Undergraduate Journal of Geography, 6.

Smardon, R., Moran, S., & Baptiste, A. K. (2018). Revitalizing urban waterway communities: Streams of environmental justice. Routledge. Smith, B. R. (2007). Assessing the feasibility of creek daylighting in San Francisco, part I: a synthesis of lessons learned from existing urban daylighting projects.

Smith, K. (n.d.). Bratenahl. Cleveland Historical. Retrieved March 4, 2023, from https:// clevelandhistorical.org/items/show/358#:~:- text=The%20village%20began%20as%20farmland,property%20for%20their%20homes%20 here

Smith, J. (n.d.). Lick Run Greenway. Project Groundwork. Retrieved March 8, 2023, from https://projectgroundwork.org/projects/lowermillcreek/sustainable/lickrun/index.htm

Spacing Atlantic (November 10, 2014). A River Runs Under it: Daylighting Sawmill River. Retrieved March 7, 2022, from, https://spacing.ca/ atlantic/2014/11/10/river-runs-daylighting-sawmill-river/

Southern, J.M. & Roy, C.. (n.d.). Dugway brook. Cleveland Historical. Retrieved March 4, 2023, from https://clevelandhistorical.org/items/ show/546

St. Aloysius-St. Agatha Parish. (n.d.). Hunger Center. Retrieved February 26, 2023, from chrome://history/?q=nailhttp://saintaloysiuscleveland.com/hunger-center/

Stephen, J. (2001). Nine Mile Run Greenway. Race, Poverty & the Environment, 8(1), 27–28. http://www.jstor.org/stable/41554316

Strand Associates, Inc. (2022, June 3). Lick Run Greenway – Metropolitan Sewer District of Greater Cincinnati (MSDGC), OH. Strand Associates, Inc. Retrieved March 8, 2023, from https://www.strand.com/strand_projects/ lick-run-greenway-metropolitan-sewer-district-of-greater-cincinnati-msdgc-oh/

SUSTAINABLE STREAMS, LLC. (2021, February). Projects. Sustainable Streams. Retrieved March 8, 2023, from https://www.sustainablestreams. com/projects

The American Public Works Association. (2022, February 24). Project of the Year Award_Lick Run_FINAL.pdf. Retrieved March 8, 2023, from http://ohio.apwa.net/Content/Chapters/ohio. apwa.net/file/2022%20Award%20Winners/ Project%20of%20the%20Year%20Award_ Lick%20Run_FINAL.pdf

The Cleveland Observer. (n.d.). The Nail Nook Polishes Bratenahl. Retrieved March 4, 2023, from https://www.theclevelandobserver.com/ the-nail-nook-polishes-bratenahl/

The Metropolitan Sewer District of Greater Cincinnati. (2012, December 18). Lower Mill Creek Partial Remedy - US EPA. Lower Mill Creek Partial Remedy Study, Metropolitan District of Greater Cincinnati, Dec. 2012. Retrieved March 9, 2023, from https://archive.epa.gov/r5water/ lowermillcreek/web/pdf/a2_%20revised-Imcprstudy_report_proposal-20dec2012.pdf

Trump, J. J. (2021, February 19). Road diets and Greenways - Virginia Tech. Road Diets and Greenways. Retrieved March 9, 2023, from https://vtechworks.lib.vt.edu/bitstream/handle/10919/102415/Trump_JJ_T_2021.pdf

The Nature Conservancy. (2022, September 18). Spring and Fall Birding in Ohio. Retrieved from https://www.nature.org/en-us/about-us/ where-we-work/united-states/ohio/stories-inohio/ohio-spring-fall-birdwatching/

The Village of Bratenahl (n.d.). Bratenahl Community Center. Retrieved March 5, 2023, from https://www.bratenahl.org/Facilities/Facility/ Details/Bratenahl-Community-Center-1

The Village of Bratenahl. (n.d.-a). Departments. Retrieved March 5, 2023, from https://www. bratenahl.org/101/Departments

Trice, A. (2013). Daylighting streams: breathing life into urban streams and communities. American Rivers, Washington. https://www.americanrivers.org/wp-content/uploads/2016/05/ AmericanRivers_daylighting-streams-report.pdf Trust for Public Land. (n.d.). ParkServe. Retrieved March 5, 2023, from https://parkserve. tpl.org/mapping/#reportTop

U.S. Bureau of Labor Statistics. (n.d.). CPI inflation calculator. U.S. Bureau of Labor Statistics. Retrieved March 8, 2023, from https://www.bls. gov/data/inflation_calculator.htm

UNC School (March 22, 2018). Student Corner: The Benefits of Daylighting Streams. Retrieved March 7, 2022, from, https://ced. sog.unc.edu/2018/03/the-benefits-of-daylighting-streams/

University, C. M. (2007, July 30). Western Pennsylvania Brownfields Center - Carnegie Mellon University. CMU. Retrieved March 9, 2023, from https://www.cmu.edu/steinbrenner/brownfields/

University of Connecticut (January 17, 2022). New Study Finds Stream Restorations Increase Home Values. Retrieved March 7, 2022, from, https://today.uconn.edu/2022/01/new-studyfinds-stream-restorations-increase-home-values/#

University of Pittsburgh. (2014, December 17). National model of restoration: Nine Mile Run. ScienceDaily. Retrieved March 8, 2023, from www.sciencedaily.com/releases/2014/12/141217131443.htm

United States Department of Agriculture. (2022, December 9). Food Access Research Atlas. Retrieved February 20, 2023, from https://www. ers.usda.gov/data-products/food-access-research-atlas/go-to-the-atlas/

United States Environmental Protection Agency. (2019). Fact Sheet: Past Property Uses May Result in a Brownfield Site. Retrieved from https:// www.epa.gov/sites/production/files/2019-09/ documents/past_property_uses_may_result_

in_a_brownfield_site.pdf

United States Environmental Protection Agency. (2022, September 6). Smart Location Mapping National Walkability Index. Retrieved February 20, 2023, from https://epa.maps. arcgis.com/home/webmap/viewer.html?webmap=f16f5e2f84884b93b380cfd4be9f0bba

United States Environmental Protection Agency. (2022a, September 6). Smart Location Mapping Smart Location Calculator. Retrieved February 20, 2023, from https://www.slc.gsa.gov/slc/

United States Environmental Protection Agency (2011, July). Lick Run Watershed Strategic Integration Plan. https://projectgroundwork. org/downloads/cfac/Lick_run_strategic_integration_plan_July2011_Final_Full_Report.pdf

United States Environmental Protection Agency. (2022b, September 6). Smart Location Mapping Smart Location Database. Retrieved March 4, 2023, from https://epa.maps.arcgis.com/ home/webmap/viewer.html?webmap=137d4e-512249480c980e00807562da10

Vogel, M. (2021, May 18). Photos: Lick Run Greenway officially opens in South Fairmount. Cincinnati News, Sports and Things to Do. Retrieved March 8, 2023, from https://www.cincinnati.com/picture-gallery/ news/2021/05/18/photos-lick-run-greenway-officially-opens-south-fairmount/5146812001/

Village of Bratenahl. (2013). Village of Bratenahl Strategic Master Plan. https://www.bratenahl. org/DocumentCenter/View/1153/Strategic-Master-Plan

Washington State Department of Health. Share-Point/C4PA/ Community Engagement Guide. Community Engagement Guide (wa.gov) Water Resources Utility of the Future. (2015, September 10). 2015 UOTF Annual Report design. Microsoft Word - 2015 UOTF Annual Report design.docx. Retrieved March 9, 2023, from https://www.nacwa.org/docs/ default-source/news-publications/White-Papers/2015-09-10uotf-annual-report.pdf?sfvrsn=2

Wild, T. C., Bernet, J. F., Westling, E. L., & Lerner, D. N. (2011). Deculverting: reviewing the evidence on the 'daylighting' and restoration of culverted rivers. Water and Environment Journal, 25(3), 412-421.

APPENDIX A

Community Resources Inventory & Google Map:					
Civic Buildings					
Bratenahl Community Center	10300 Brighton Rd, Bratenahl, OH 44108	216-451-5350			
Bratenahl Historical Society	10300 Brighton Rd, Bratenahl, OH 44108	216-533-1108			
Bratenahl Village Hall	411 Bratenahl Rd, Cleveland, OH 44108	216-681-4266			
United States Postal Service	630 E 105th St, Cleveland, OH 44108	1-800-275-8777			
Police Stations					
Bratenahl Village Police Department	411 Bratenahl Rd, Cleveland, OH 44108	216-681-1234			
Fifth District Police Station (South-Collinwood)	881 East 152nd St., Cleveland, OH 44110				
Fire Stations					
Fire Station #30	10225 St. Clair Ave., Cleveland, OH 44108				
Parks & Recreation Facilities					
Bratenahl Dog Park	411 Bratenahl Rd, Cleveland, OH 44108				
Cleveland Cory Recreation Center	10510 Drexel Ave., Cleveland, OH 44108	216-664-3389			
Cleveland Lakefront Nature Preserve	8701 Lakeshore Blvd, Cleveland, OH 44108	216-377-1348			
Flora Park	Flora Ave., & E. 103rd St., Cleveland, OH 44108				
Forest Hills Park	12310 Arlington, Cleveland, OH 44108				
Glenview Park	10746 Leuer Ave., Cleveland, OH 44108				
Glenville Recreation Center	680 East 113th Street, Cleveland, OH 44108	216-664-2516			
Martin Luther King Jr. Park	E. 107th & Elk Ave., Cleveland, OH 44108				
Rockefeller Park Greenhouse & Botanical Garden	750 E 88th St, Cleveland, OH 44108	216-664-3103			
Sam Miller Park	771 E 88th St, Cleveland, OH 44108				
Schools					
Brightside Academy Ohio - St. Clair	10548 St Clair Ave., Cleveland, OH 44108	216-268-1800			
Citizens Glenville Campus-Breakthrough Public Schools	12523 Woodside Ave, Cleveland, OH 44108	216-367-9392			
Franklin D. Roosevelt (PreK-8)	800 Linn Dr., Cleveland, OH 44108	216-838-2200			
Glenville High School (9-12)	650 East 113th St., Cleveland, OH 44108	216-838-2000			
Michael R. White (K-8)	1000 E. 92nd St., Cleveland, OH 44108	216-838-2300			
Stephanie Tubbs Jones School (PreK-8)	11901 Durant Ave., Cleveland, OH 44108	216-838-2350			
Stonebrook Montessori at Michael R. White (PreK-6)	975 East Boulevard, Cleveland, OH 44102	216-451-7013			
Libraries					
Cleveland Public Library-Glenville Branch	11900 St. Clair Ave., Cleveland, OH 44108	216-623-6983			

Religious Organizations					
Apostolic Faith Tabernacle	934 E. 105th St., Cleveland, OH 44108	216-681-3033			
Bethany Baptist Church	1211 E. 105th St., Cleveland, OH 44108	216-791-2673			
Central Christian Church	E. 105th St., Cleveland, OH 44108	216-851-2235			
Charity Baptist Church	959 Parkwood Dr., Cleveland, OH 44108	216-451-5780			
Christ Temple Apostolic Faith Church, Inc.	860 Eddy Rd., Cleveland, OH 44108	216-761-4101			
Church of Christ at The Boulevard	8837 St. Clair Ave., Cleveland, OH 44108	216-451-7125			
Church of God and Saints of Christ					
Church of the Living God	10305 Garfield Ave., Cleveland, OH 44108	216-681-9999			
Cleveland Church of Christ	1035 E. 105th St., Cleveland, OH 44108	216-761-4500			
Cleveland Historical Cory United Medthodist	1117 E. 105th St., Cleveland, OH 44108				
Evangel Temple Holiness Church	509 E. 105th St., Cleveland, OH 44108	216-249-3452			
Evening Star Baptist Church	9902 St Clair Ave., Cleveland, OH 44108	216-268-2585			
Everlasting Baptist Church	579 Eddy Rd., Cleveland, OH 44108	216-681-5189			
First Zion Missionary Baptist Church	10313 Garfield Ave., Cleveland, OH 44108	216-417-6422			
Glenville Church of God	744 E 105th St, Cleveland, OH 44108	216-681-7474			
Glenville Present Truth Seventh-day Adventist Church	737 E 105th St., Cleveland, OH 44108	216-772-2677			
Greater Abyssinia Baptist Church	1161 East 105th St., Cleveland, Ohio 44108	216-795.1842			
Greater Friendship Baptist Church	12305 Arlington Ave., Cleveland, OH 44108	216-451-5770			
Greater New Zion Baptist Church	997 Lakeview Rd., Cleveland, OH 44108	216-451-6128			
Integrated Faith Assembly	10915 Morison Ave., Cleveland, OH 44108	216-451-1600			
Lee Memorial AME Church	861 E 105th St., Cleveland, OH 44108	216-761-4447			
Mt Moriah Baptish Church	Cleveland, OH 44108	216-451-7585			
New Jeruslem Church-God & Christian	954 E 105th St., Cleveland, OH 44108	216-541-5000			
NuVision Missionary Baptist Church	954 Linn Dr., Cleveland, OH 44108	216-926-8679			
Philemon Community Baptist Church	12618 Shaw Ave., Cleveland, OH 44108	216-268-5127			
Pilgrim Church of Christ	616 E 105th St., Cleveland, OH 44108	216-761-2279			
Second Lakeview Baptist Church	Cleveland, OH 44108	216-761-1659			
Second Mt. Olive Missionary Baptist Church	757 Eddy Rd., Cleveland, OH 44108	216-727-0007			
Second St. John Baptist Church	717 E 125th St., Cleveland, OH 44108	216-451-7792			
St. Aloysius - St. Agatha Parish	10932 St. Clair Ave., Cleveland, OH 44108	216-451-3262			
Starlight Baptist Church	1456 Euclid Ave., Cleveland, OH 44112	216-541-6825			
True Vine Missionary Baptist Church	711 E 105th St.z, Cleveland, OH 44108	216-451-7816			
Wilson United Methodist Church	9226 St Clair Ave., Cleveland, OH 44108	216-249-2200			
Salons & Barbershops					
A New U Hair Studio	12405 St Clair Ave., Cleveland, OH 44108	216-761-6059			
All the King's Men Barbershop	9111 St Clair Ave., Cleveland, OH 44108	216-801-2892			
Best Nails	10340 St. Clair Ave., Cleveland, OH 44108	216-761-8817			
Family Beauty & Hair	10543 St. Clair Ave., Cleveland, OH 44108	216-563-1711			
First Draft Picks 2 Barbershop	886 E. 105th St., Cleveland, OH 44108				

Good Fella's Barber Shop	12436 Arlington Ave., Cleveland, OH 44108	216-851-4663			
Hairjunkies Inc.	882 E. 105th St., Cleveland, OH 44108	216-299-5754			
Lady G's Barber Salon	962 E. 105th St., Cleveland, OH 44108	216-541-9427			
Masterminds	12509 St Clair Ave., Cleveland, OH 44108	216-415-2324			
Neighborhood & Celebrities Barber Shop	460 Dundee Dr., Cleveland, OH 44108				
Pendleton Barber Shop	12423 St Clair Ave., Cleveland, OH 44108	216-851-7525			
Tarbloodersports Barber Shop	10533 St Clair Ave., Cleveland, OH 44108	216-600-5403			
The Coolest Cuts	927 E 123rd St., Cleveland, OH 44108	216-600-9702			
The Nail Nook	1 Bratenahl Place, Bratenahl, OH 44108	216-406-6665			
Topp's Family Barber Shop	12816 St Clair Ave., Cleveland, OH 44108	216-812-9536			
Markets & Grocery					
Central Fox Market	453 Dundee Dr, Cleveland, OH 44108	216-451-1419			
Dollar General	10390 St Clair Ave., Cleveland, OH 44108	216-400-8185			
Family Dollar	12107 St Clair Ave., Cleveland, OH 44108	216-706-0276			
Sav-Mor Bi-Rite	12901 Shaw Ave, Cleveland, OH 44108	216-268-4983			
Save A Lot	12432 St Clair Ave., Cleveland, OH 44108	216-249-1257			
The New Eastside Market	10505 St Clair Ave., Cleveland, OH 44108	216-331-6099			
Food Distribution Center					
Pilgrim Church of Christ	616 E. 105th St, Cleveland, OH 44108	216-761-2279			
True Vine Missionary Baptist Church	711 E 105th St, Cleveland, OH 44108	216-451-7816			
Saint Aloysius Church	10932 St. Clair Ave., Cleveland, OH 44108	216-451-3262			
Cory United Methodist Church	1117 E 105th St, Cleveland, OH 44108	216-451-0460			
Philemon Community Baptist Church	12618 Shaw Ave, Cleveland, OH 44108	216-268-5127			
Healthcare					
Glenville Health Center at the J. Glen Smith Health Center	11100 St Clair Ave., Cleveland, OH 44108	216-957-5600			
MAC Pharmacy	10414 St Clair Ave., Cleveland, OH 44108	216-800-0223			
MetroHealth Department of Pediatrics	11100 St Clair Ave., Cleveland, OH 44108	216-249-3600			
Murtis Taylor Human Services System	900 E. 105th St., Cleveland, OH 44108	216-283-4400			
Oak Street Health Glenville Primary Care Clinic	10553 St Clair Ave., Cleveland, OH 44108	216-202-5780			
Project H.O.P.E. of Cleveland	10932 St Clair Ave., Cleveland, OH 44108	216-391-7557			
Local Businesses					
A Sophisticated You, LLC	540 E 105th St., Cleveland, OH 44108	(216-297-5318			
Bratenahl Place Bistro	1 Bratenahl Place, Cleveland, OH 44108	216-541-3900			
China House II	10571 Saint Clair Ave., Cleveland, OH 44108	216-451-8888			
Cleveland Steel Tool	474 E 105th St., Cleveland, OH 44108 216-681-740				
Marnex Products Company	418 Bratenahl Rd., Cleveland, OH 44108	888-391-7027			
M.S. Barkin Co.	246 E 131 St., Cleveland, OH 44108	216-761-9500			
Open Pitt Barb-B-Que	12335 Saint Clair Ave., Cleveland, OH 44108	216-851-7709			
Shaw Dairy	12810 Shaw Ave., Cleveland, OH 44108 216-541-4116				

Public Transit				
#1 Bus: St. Clair	Service between Downtown Cleveland and E. 153rd St. (Loop)			
#10 Bus: East 105 - Lakeshore	Service between Turney Ella Loop and Shoregate Town Center.			
#35 Bus: Lee Blvd East 123	Service between East 129 Loop and Severance Town Center via Louis Stokes - Windermere Station			
#39 Bus: Lakeshore	Service between Shoregate Town Center and Downtown Cleve- land			
#40 Bus: Lakeview - Lee	Service between Taft Ave Eddy Rd. and Southgate Transit Center			
Red Line Rail Service - Superior Station & Stokes-Windermere Station	Service between the Louis Stokes Station at Windermere and Cleveland Hopkins International Airport, via Downtown Cleveland.			
Landmarks				
Local Landmarks				
Empire Junior High School	9113 Parmelee Ave., Architect: Walter McCornack (1915)			
Pilgrim Church of Christ	616 East 105th St., Architect: Arthur N. Oviatt (1908) & Charles Coveney (1923)			
Glenville-Bratenahl U.S. Post Office, Luke Easter Building	630 East 105th St., Architect: R. Stanley-Brown (1936)			
Otto Narveleit Building	10123 St. Clair Ave., Architect: Paul Geier (1906)			
Central Christian Church	697 East 105th St., Architect: Knox and Elliot (1900)			
Glenville New Life Community Church	711 East 105th St., Architect: William Warren Sabin (1894) & Reynold H. Hinsdale (1911)			
Glenville Seventh Day Adventist Church	737 East 105th St., Architect: Maurer & Mills (1915)			
Jerry Siegel House	10622 Kimberly Ave., Architect: Unknown (1911)			
Apostolic Faith Tabernacle Church	934 East 105th St., Architect: Meyer Altschuld (1920)			
Morison Avenue Baptist Church (Morison Avenue Community Baths)	10606 Morison Ave., Architect: Meyer Altschuld (1925)			
Integrated Faith Assembly Church (Oheb Zedek Synagogue)	1024 Parkwood Dr., Architect: Markowitz & Vetter (1922)			
Greater Friendship Baptist Church	12305 Arlington Ave., Architect: Corbusier, Lenski & Foster (1926)			
Schellentrager House	690 Lakeview Rd., Architect: Fenimore C. Bate (1893)			
St. Aloysius Church	10932 St. Clair Ave., Architect: William Jansen (1925)			
Seabright Terrace	543 East 114th St., Architect: Hartzell & Petti (1906)			
Nearby Landmark Districts				
Grantwood Allotments - Local Landmark District				
East Boulevard Historict District - Local Landmark District & National Historic District				
Rockefeller Park and Cleveland Cultural Gardens Historic District - National Historic Districts				

APPENDIX B

Confirmed Dugway Brook Project Partners & Advisory Committee Member / Partners

Bluestone Conservation:

Role: Lead Hike-Shops and assist with listening sessions.

Bratenahl Local Government: The Village of Bratenahl

Role: Serve on the advisory committee and provide input and review of preliminary designs. Website: https://www.bratenahl.org/

Chagrin River Watershed Partners - CWRP:

Role: Facilitate Advisory Committee Meetings, lead RFP development and contractor selection, subcontract with design consultant, co-lead stakeholder outreach and help organize town hall meetings and project site walks.

Cleveland Local Government: The City of Cleveland

Role: Serve on the advisory committee, provide input to the restoration plan regarding use of City property, and support community engagement in the project. Website: https://www.clevelandohio. gov/

Cleveland Neighborhood Progress: About Us

Role: Collaborate on the project, serve on the advisory committee, and engage the community in developing a vision and plan for Dugway brook.

Website: http://www.clevelandnp.org/

Cuyahoga Soil & Water Conservation District (SWCD):

"Mission: Implement programs and practices that protect and restore healthy soil and water resources." Role: Plan and staff listening sessions, engage Glenville High School students, and support community engagement events Website: https://www.cuyahogaswcd. org/

Doan Brook Watershed Partnership (DBWP):

Role: Serve on the advisory committee and support community engagement Website: https://doanbrookpartnership. org/mission-and-vision/

Northeast Ohio Regional Sewer District (NEORSD):

Role: Serve on the advisory committee and provide match funds to support site assessment and preliminary design. Website: https://www.neorsd.org/

Other: Research Potential Partners:

Role: Serve on the advisory committees, support community engagement, and/or provide input and review on preliminary designs, etc.

APPENDIX C

Confirmed Member Partners

- Black Environmental Leaders Association
- Bluestone Conservation: Roy Larick, PhD
- Chagrin River Watershed Partners -CRWP
- City of Cleveland
- Cleveland Foundation Potential Advisory Committee Partners
- Cleveland Metroparks
- Cleveland Neighborhood Progress
- Cleveland Metropolitan School
 District
- Cuyahoga Soil & Water Conservation District - SWCD
- Doan Brook Watershed Partnership DBWP
- Famicos Foundation

- Glenville Resident Faruq Abdul-Khaliq (Cleveland Metroparks Youth Outdoors)
- MORE Glenville Residents
- Neighborhood Connections/ NeighborUp
- LAND Studio
- Northeast Ohio Regional Sewer
 District NEORSD
- Ohio Department of Natural Resources - ODNR (Office of Coastal Management)
- Ohio Land Conservation Trust for Public Land
- Village of Bratenahl
- Western Reserve Land Conservancy Thriving Communities

APPENDIX D

Potential Impact Map

In Baltimore, homes within 1,000 ft of a restored stream saw an average increase of 15% in their prices; those within 2,000 ft saw an average increase of 11%; homes more than 3,000 feet from the restored stream did not see

any considerable change in their prices (UConn Today, 2022). This impact map shows a similar potential increase in home prices in Glenville per 1,000 ft radius increments due to the daylighting of Dugway Brook.



Graphic by Hinal Sorathiya

APPENDIX E

Highest and Best Use Analysis

- Lot size: the 0.96 acre size of the site relative to the minimum size needed for the potential use
- Zoning: the current residential zoning of the site relative to the potential use
- Proximate land use: the compatibility of the potential use with surrounding neighborhood
- Visibility: the visibility of the site from St. Clair Ave.

- Traffic counts: the site's 15,033 average annual daily traffic (AADT) for each potential use
- Walkability: the site's walkability score (70, sourced from walkscore.com)
- Competition: in the same market segment as each use
- Community objectives: compatability with identified needs in 2017 Glenville Plan

Attributes	Affordable Single- Family	Restruant	Office	Local Retail	Affordable Apartments	Parking Lot	Auto Repair School
Lot Size	1	2	1	2	1	2	2
Zoning	2	-1	-2	-1	2	-2	-2
Proximate Land Use	2		-2	1	2	0	-2
Visibility	0	2	1	2	0	1	1
Traffic Counts	-1	2	0	2	0	2	0
Walkability	2	2	1	2	2	1	0
Competition	2	1	0	2	2	-1	0
Community Objectives	2	1	2	2	2	-2	1
Total	10	9	1	12	11	1	0

APPENDIX F

Local Retail Segments 5-Year Estimated Spending Growth (2022 & 2027 Estimates)

Retail SIC Code	Apparel & Services	Entertainment & Recreation	Food	Home	Transportation	
5-min						
2022 Spending	\$249,024	\$369,411	\$1,086,274	\$1,037,112	\$329,306	
2027 Demand	\$289,952	\$430,125	\$1,264,806	\$1,207,564	\$383,429	
Projected Growth	\$40,928	\$60,714	\$178,532	\$170,452	\$54,123	
10-min						
2022 Spending	\$995,312	\$1,473,257	\$4,341,786	\$ 4,111,914	\$1,308,160	
2027 Demand	\$1,186,322	\$1,755,890	\$5,175,023	\$4,900,000	\$1,558,960	
Projected Growth	\$191,010	\$282,633	\$833,237	\$788,086	\$250,800	
15-min						
2022 Spending	\$2,278,115	\$3,330,109	\$938,668	\$8,986,774	\$2,886,165	
2027 Demand	\$2,691,426	\$3,931,792	\$11,741,880	\$10,591,755	\$3,403,501	
Projected Growth	\$413,311	\$601,683	\$10,803,212	\$1,604,981	\$517,336	

Source: ESRI Business Analyst, 2022 and 2027 estimates.



CAPSTONE STUDIOS MAY 2023