



# BRIDGE BETHLEHEM

PEDESTRIAN BRIDGE FEASIBILITY STUDY

July 29, 2022  
**FINAL REPORT**







### ***The Walking City***

*We envision a bridge that allows safe passage for all community members, including walkers, bikers and runners, and unites North and South Bethlehem's neighborhoods and businesses, allowing them to flourish as one.*

*We believe that an architecturally beautiful bridge that promotes recreational enjoyment of the river is essential for Bethlehem to become a true walking city.*

The Lehigh River Pedestrian/Bicycle  
Bridge Report, June 2017



# ACKNOWLEDGEMENTS

## THE WORKING GROUP

- + **Paige Van Wirt**  
City Council Member
- + **Kassie Hilgert**  
ArtsQuest
- + **Scott Slingerland**  
Coalition for Appropriate Transportation
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- + **Brian Nicas**  
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- + **Molly Wood**  
LANTA
- + **Brent Stringfellow**  
Lehigh University
- + **Tina Smith**  
Northampton County DCED
- + **Melissa Shafer**  
St. Luke's University Hospital

## KEY PARTNERS & FUNDERS



*This project was financed in part by a grant from the Community Conservation Partnerships Program, (Keystone Recreation, Park and Conservation Fund), under the administration of the Pennsylvania Department of Conservation and Natural Resources, Bureau of Recreation and Conservation.*

*This program is also being funded in part by the Community Investment Partnership Program through the County of Northampton Department of Community & Economic Development.*

## PLANNING & ENGINEERING TEAM







**BRIDGE**  
BETHLEHEM



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# ABOUT THE STUDY



# PURPOSE

This study rose out of a grassroots effort led by passionate city residents who envisioned a safer connection between the area’s trails. Their idea sparked a robust civic discourse that spanned a series of public meetings and led to a vision for a true walking city.

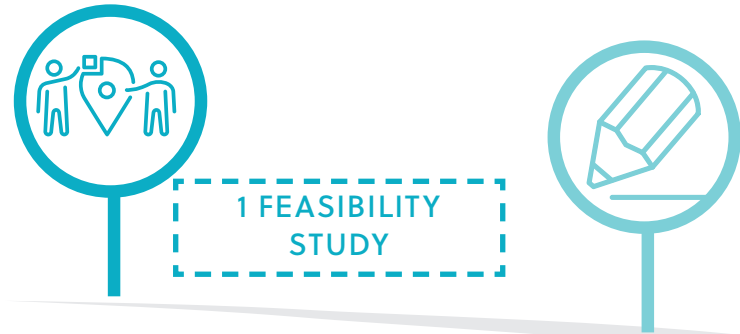
Commissioned by the City of Bethlehem, this study takes the important next step of exploring the feasibility of a non-auto-oriented bridge that could create a safe pedestrian and bicycle crossing over the Lehigh River in downtown Bethlehem.

The objective of this study was to engage the community in shaping a collective vision for the crossing by identifying the location of and developing three conceptual bridge alternatives, including a preferred alternative. The study also conducted a preliminary analysis of critical considerations including environmental impacts, historic and cultural resource preservation, accessibility, permitting, parcel and right-of-way acquisition, order-of-magnitude costs, as well as an analysis of potential benefits. Lastly, the study was intended to lay out the next set of steps necessary to advance the realization of a pedestrian bridge.

## PROCESS

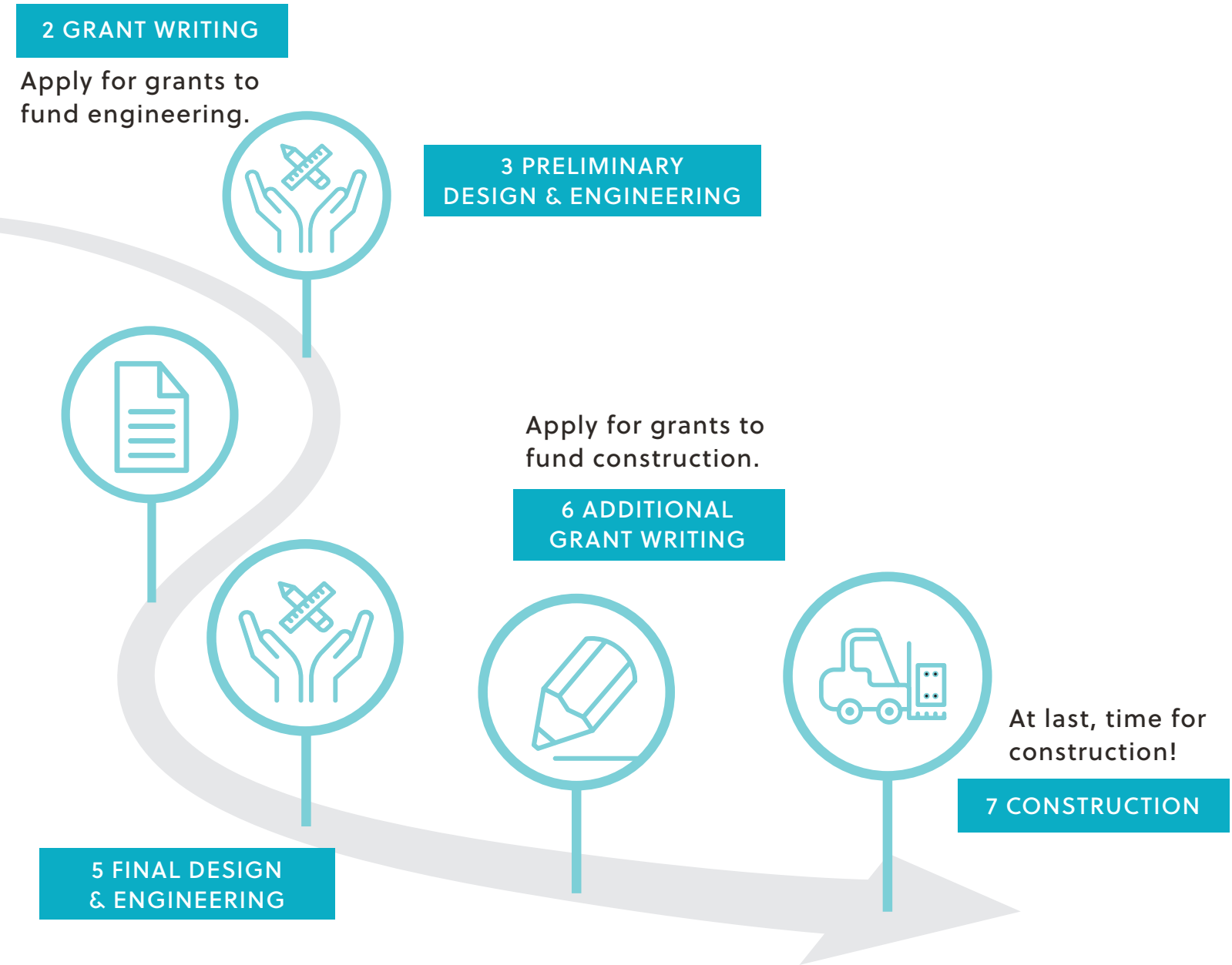
The Feasibility Study entailed an iterative planning and engagement process led by planning and design firm, WRT, and engineering firm, Michael Baker International (MBI). The consultant team worked with the City to establish a Working Team of city and county partners to advise on the project at key milestones to compliment the feedback gathered in community-wide meetings and activities. The process integrated a series of feedback loops to ensure the evolving conceptual alternatives reflected the community’s preferences.

The process began with mapping and analysis of existing conditions, followed by a series of engagement activities to better understand the community’s and stakeholders’ aspirations for the bridge. This resulted in a set of Guiding Principles to evaluate considerations such as the location of the bridge, the types of programming that could happen along the bridge, and the character, features, and form of the bridge. These principles are also intended to continue to guide the process moving forward.



▲ We are just at the start of the process.

4 RIGHT-OF-WAY ACQUISITION



**FIGURE 1. PATH TO IMPLEMENTATION**

This study is the first of several steps required to realize a project of this scale and complexity.



With the guiding principles in place, a series of conceptual bridge alternatives began to take shape. Multiple iterations of these were presented to the Working Group and community for review and then further refinement. The study resulted in three concepts and one preferred alternative. Michael Baker International, which has designed bridges around the world, provided order-of-magnitude cost estimates for each concept, also included in this report.

## SEIZING THE OPPORTUNITY TO BECOME A 21<sup>ST</sup> CENTURY CITY

From the time it was first established, the City of Bethlehem has been home to innovative thinkers looking for ways to reimagine and improve their living environment. In that same tradition, a group local organizers led by the Lehigh Valley Sierra Club and South Side Initiative of Lehigh University had the foresight in 2017 to look at the seeds the city holds to become a model 21st century American city.

### A critical link in a regional trail network

At the regional scale, Bethlehem is one of three sister cities in the Lehigh Valley along with Allentown and Easton. Walk/Roll LV is the Lehigh Valley's first ever transportation master plan, adopted in 2020, that aims to create an integrated network that is safe to use for cyclists, pedestrians, drivers and transit users.

Part of that network is the 165-mile Delaware and Lehigh Trail that runs along the north side of the Lehigh River through Bethlehem. The recently completed South Bethlehem Greenway runs for 1.9 miles south toward Hellertown, where it hopes to hook up with the 6.9-mile Saucon Rail Trail.

A bridge connecting the Delaware & Lehigh Trail with the South Bethlehem Greenway would fill in a major gap and form a critical link in the region. This alone could have a significant impact on life in Bethlehem by connecting the city and residents to other area employment centers, reducing auto traffic, expanding recreational opportunities, attracting more visitors to the downtown who may come to bike or hike the region, and fostering a more walkable urban core.

### Acting on the Climate Action Plan

Filling in this missing regional trail link also has the potential to achieve so much more. Increasing the options residents of Bethlehem have to get around the city and the region could lead to a significant reduction in the total number of vehicle miles traveled and related auto emissions. This is one of many ways a pedestrian bridge could support the city's Climate Action Plan, which was adopted in 2021.

### Living, working, playing all in one place

The global COVID-19 pandemic hovered in the background of the feasibility study from beginning to end. One of the many lessons it taught is how much every day matters. The pandemic changed the nature of office work and the need for people to be tethered to a company desk, shifting preferences about where to locate one's home office and ideas about how we choose to live our lives. People picked up and moved themselves and their families to places offering a high quality of life with amenities within walking distance and options other than cars to get around. A pedestrian bridge in Bethlehem would enhance all the city has to offer by zipping together both sides of two very walkable downtowns, rich with history, the arts, culture, events, and abundant activities.

### An outdoor living room where all are welcome

While an iconic bridge could become a destination in and of itself that could attract more visitors, creating a pedestrian and bike connection has even greater potential to bring together those who already call Bethlehem home. Stitching together the two sides of the river and creating an inviting centrally located, civic place, accessible to all, free to use, offers the potential for residents of all ages and interests to find and enjoy common ground.

## MEASURING THE POTENTIAL BENEFITS

Measuring the impact of so many variables and intangibles is difficult to predict. “If we build it, will they come, asks Kevin Costner’s Ray Kinsella in *Field of Dreams*. If they come, what will the outcome be? Will the potential benefits far outweigh the investment to build it? These are important questions to ask in light of the significant investment a bridge of this nature entails. There is no doubt that as a nation we have arrived at a significant point of reflection in the way we live our lives, access employment, respect and care for our neighbors, use our natural resources, and invest in and use our cities.

To estimate the full potential impact of a pedestrian bridge in Bethlehem, Econsult Solutions Incorporated prepared an Economic Benefit Analysis based on the concept alternatives and the associated vision. The findings are summarized in the last section of this report and the full analysis is included in the Appendix.

*Stitching together the two sides of the river and creating an inviting centrally located, civic place, accessible to all, free to use, offers the potential for residents of all ages and interests to find and enjoy common ground.*



PROVIDENCE RIVER PEDESTRIAN BRIDGE (IMAGE SOURCE: WWW.BUROHAPPOLD.COM)

# THE STUDY AREA

The study area stretches between the Hill to Hill Bridge and Minsi Trail Bridge, encompassing the core of the city of Bethlehem and its many assets, including both downtown areas, the Historic District, Moravian Village, Steelstacks, and Wind Creek.

Because of the way the city developed over time, the downtowns on the north and south sides essentially compete against one another for attention, customers, and visitors. Forming a physical connection between the two downtowns would offer the potential to harness synergies and enhance economic activity on both sides of the river.

While there are three existing bridges within the study area, none of them provide a protected crossing for pedestrians and cyclists that makes them feel safe. Nor do the existing bridges present an opportunity to foster the type of walkable city that is envisioned.



**FIGURE 2. STUDY AREA**

The study area encompasses the heart of the city and many important nodes of activity.







# STUDY AREA RESOURCES

The Lehigh River has shaped the history and character of the region from its earliest roots, fueling industry, trade, transportation, and daily life. Over time, development rose up along both sides of its banks in Bethlehem and turned its back on the breathtaking views and important experiences and resources the river affords. As the City continues to reinvent itself, the Lehigh River offers a unique opportunity to turn the gaze of the community inward and knit together the two halves into a larger, more cohesive whole.

The map to the right captures many of the historic, cultural, recreational, educational, and economic resources that attract tourists, generate revenue, and define the quality of everyday life for residents.

Exploring opportunities to enhance connections to these signature assets through the addition of a pedestrian bridge was fundamental to the development of the conceptual bridge alternatives illustrated in this study.

## ARTS / CULTURE

- 1 SteelStacks / Levitt Pavilion / Christkindlmarkt
- 2 ArtsQuest Center
- 3 National Museum of Industrial History
- 4 Ice House Arts Venue
- 5 Banana Factory Arts Center
- 6 Moravian Blacksmith Shop
- 7 Historic Bethlehem Visitor Center
- 8 Touchstone Theatre
- 9 Kemerer Museum of Decorative Arts

## GOVERNMENT

- 10 City Hall

## COMMUNITY

- 11 Bethlehem Public Library
- 12 Central Moravian Church
- 13 Fowler Community Center (Northampton CC)

## EDUCATION

- 14 Moravian College South Campus
- 15 Lehigh University
- 16 Moravian Academy
- 17 Lehigh Valley Charter High School for the Arts
- 18 Broughal Middle School

## SHOPPING / TOURISM

- 19 Windcreek Outlets
- 20 3rd St Shopping Area - "Main St" South Side
- 21 Main St. North Side
- 22 Historic Bethlehem River Tours
- 23 Historic Hotel Bethlehem

## RECREATION

- 24 South Bethlehem Greenway
- 25 D & L Trail
- 26 The Bethlehem Skatepark
- 27 Steel Ice Center
- 28 Sand Island Park
- 29 Colonial Industrial Quarter
- 30 D & L Trail - Sand Island Trailhead
- 31 Bethlehem Sculpture Garden
- 32 Highland Field
- 33 Glasser Field

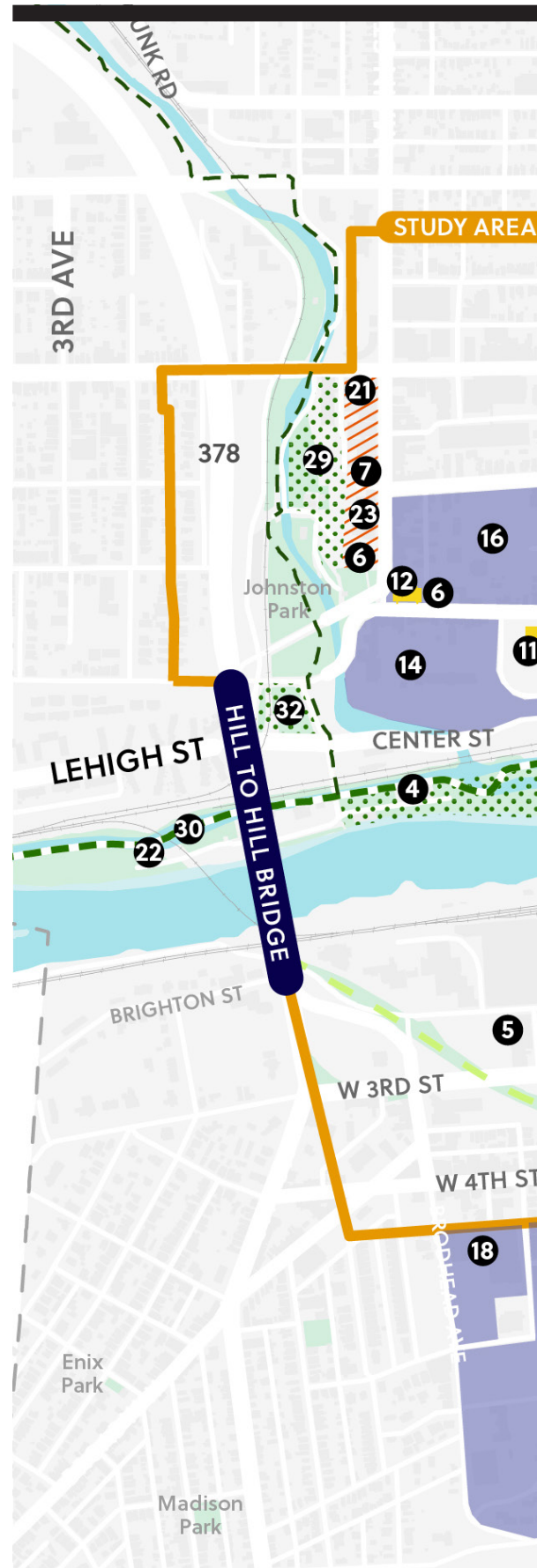
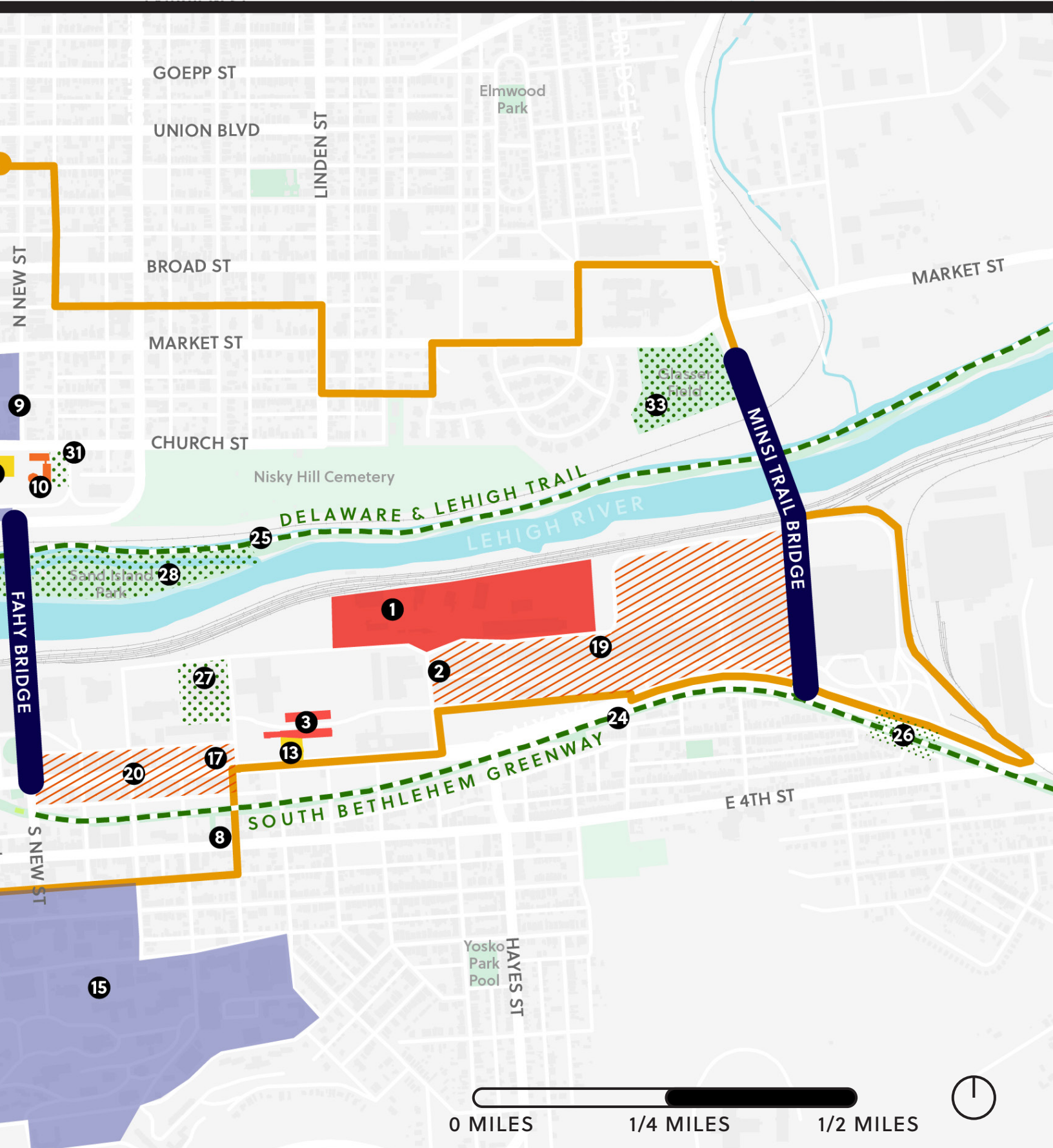


FIGURE 3. COMMUNITY ASSETS

SOURCE: ESRI











# ENGAGING THE COMMUNITY

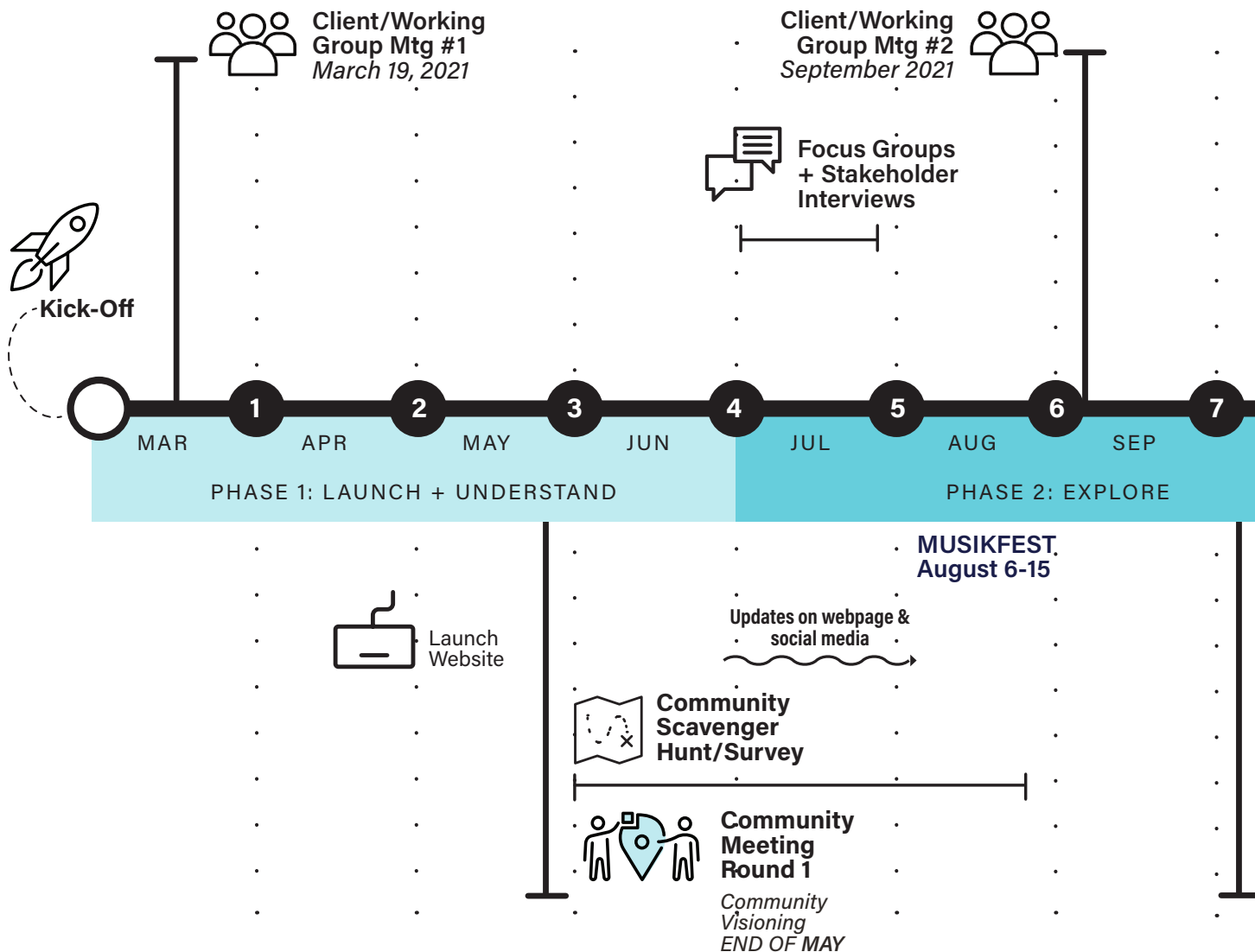


# OVERVIEW

*Despite the challenges posed by the COVID-19 pandemic, the Public and Stakeholder Involvement Strategy aimed to continue the civic dialogue started during the grassroots effort to create a pedestrian bridge.*

Continuing the tradition of civic discourse that started during the grassroots effort was an essential part of the feasibility study process.

At the outset of the project, the consultant team worked with the city to develop a multi-layered Public and Stakeholder Involvement Plan to reach the widest audience possible, including audiences often underrepresented in public planning processes. The Plan was also designed to be flexible in response to the COVID-19 pandemic with activities that could take multiple forms, from in person but socially distanced activities to fully virtual and hybrid experiences.



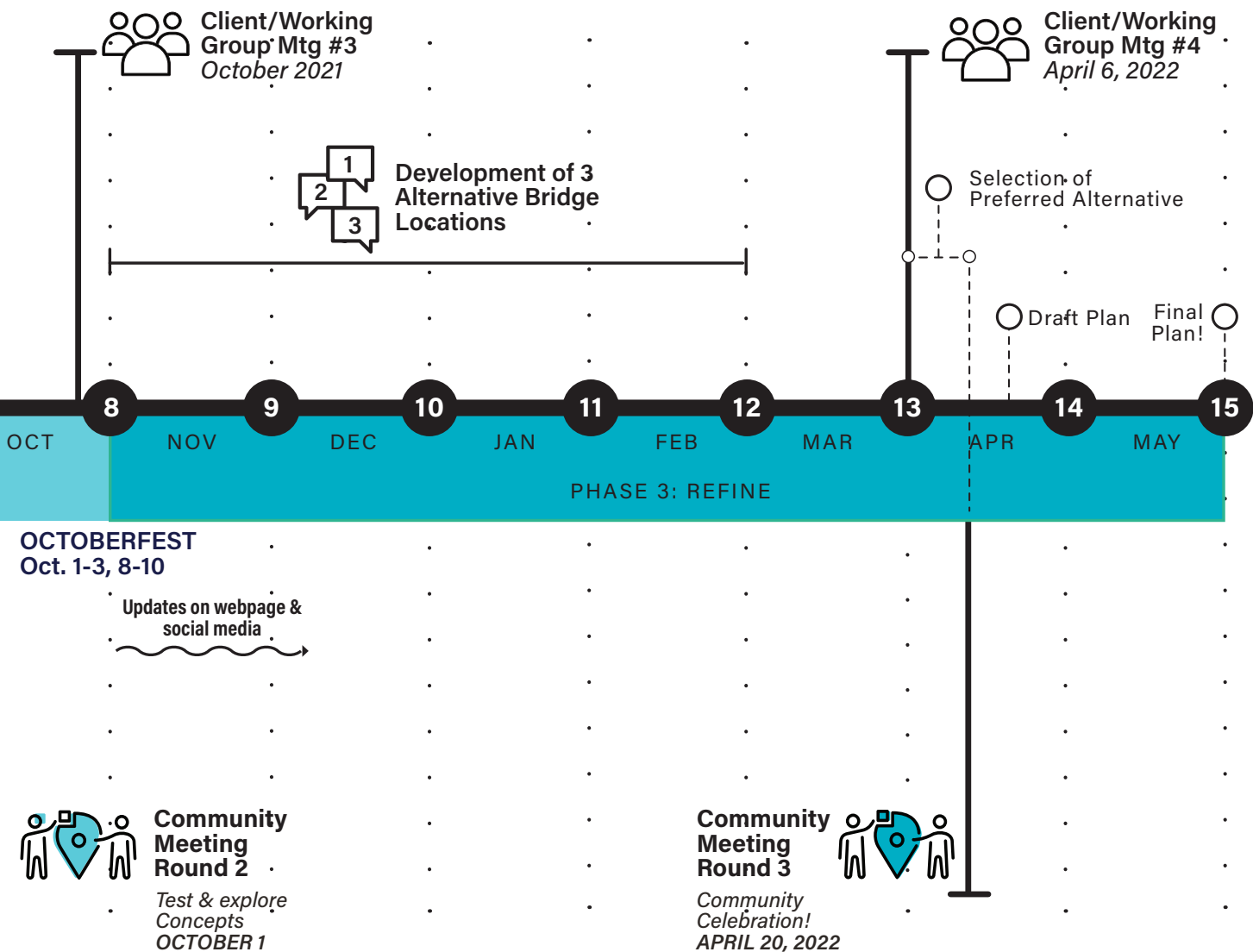


The Public and Stakeholder Involvement Plan comprised:

- + Developing a logo and branding guidelines
- + Setting up a website (bridgebethlehem.com)
- + Establishing a working group of area stakeholders that met at key milestones in the process
- + Holding a walking tour with grassroots stakeholders
- + Hosting a virtual & in person scavenger hunt to allow for social distancing

- + Presenting an interactive virtual town hall
- + Hosting a series of focus groups
- + Inspiring a series of outdoor "conversations" on the north and south sides
- + Sharing a final virtual presentation
- + Setting up a final virtual preference survey regarding the final concept alternatives

Summaries of the major activities and the key findings are described on the following pages.



# VIRTUAL TOWN HALL

The first community-wide event was held on May 25, 2021. Safety precautions related to the pandemic required a virtual event which took the form of a virtual town hall meeting on Zoom. Closed captioning in Spanish was provided. To make the meeting as interactive as possible, the presentation incorporated live polling using Mentimeter, enabling participants to see responses in real-time. Questions were submitted through Mentimeter and also in the chat feature on Zoom.

A total of 68 participants took part in the meeting. A recording of the meeting, a copy of the presentation with the polling results, and a full set of questions and answers were posted to the website.

## KEY FINDINGS:

- + The majority of meeting participants either live, work or play in Bethlehem.
- + When asked what the bridge could be, the top choice for participants was to “form a vital link in the trail network,” although there was much consensus on all of the other aspects presented.
- + The most popular amenities that participants would like the bridge to connect to include area trails, both downtowns on the north and south sides, and arts/music/cultural assets.
- + “Stitching the community together” was the most important outcome to people.
- + Events/programs people would most like to see include: a weekly farm market and monthly outdoor events such as performances or theatre.
- + Other activities most desired: Walking and running, biking safely, socializing, and having direct access to the river.

*“Stitching the community together” was the most important outcome to participants.*

## Which outcome is most important

- Reducing carbon emissions
- Being able to walk or bike to work
- Stitching the community together
- Connecting to nature
- Creating a unique destination
- Adding a boost to the economy

Less important

## Initiate!

### What events/programs would you most like to see?



Daily Program - Outdoor Classroom **7**



Daily Program - Outdoor Fitness **8**



Weekly Program



Monthly Event - Art Festival **15**

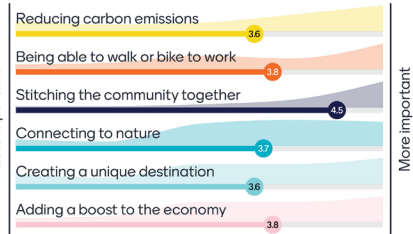


Monthly Event - Outdoor Performance/Theater **21**



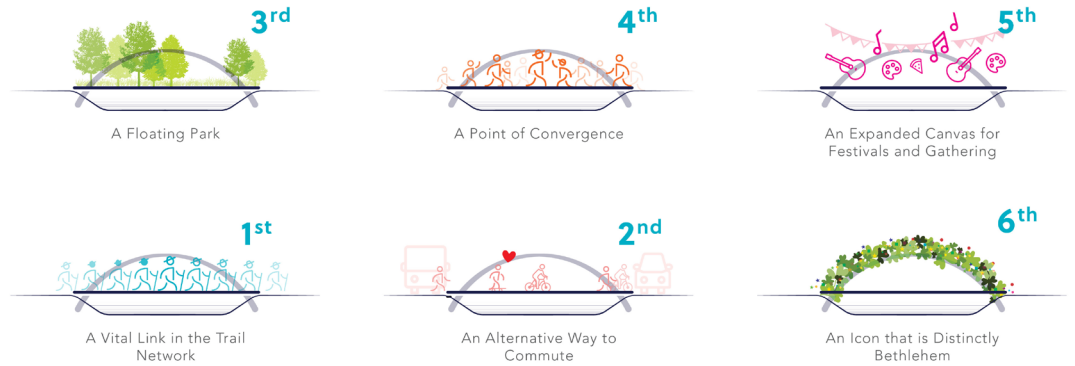
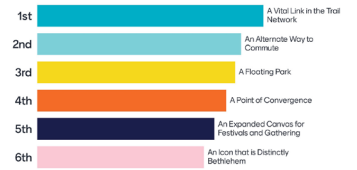
Seasonal Event

nt?



## What could our "crossing" be?

WHICH IS MOST IMPORTANT TO YOU?



## Activate!

What activities would you like to do?

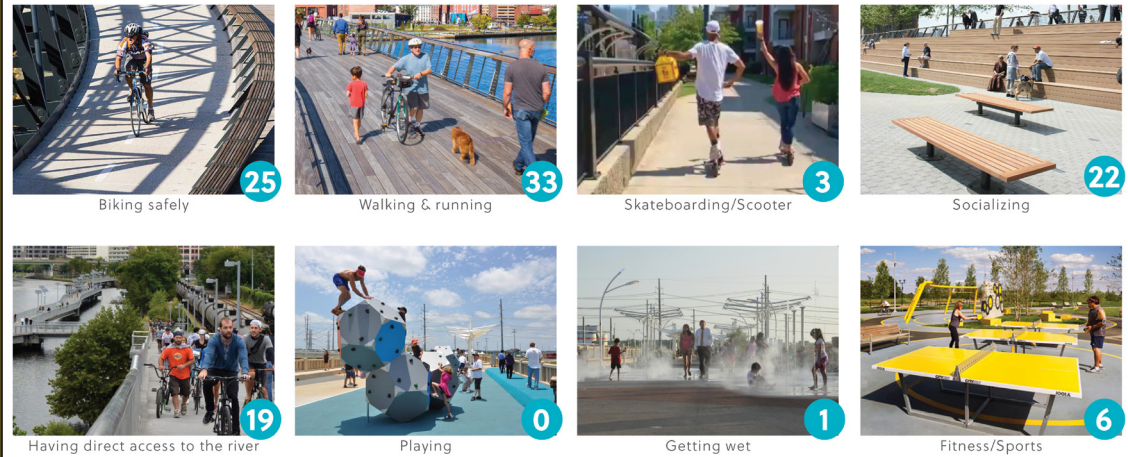


FIGURE 4. VIRTUAL TOWN HALL MEETING

Interactive polling enabled participants to respond to questions and see the responses in real time.

# SCAVENGER HUNT / SURVEY

This hybrid online-virtual survey was developed to gather input from the community on desired points of connection for the proposed bridge. Designed to be family-friendly, allow for social distancing, and encourage some physical activity, participants of all ages were invited to visit and explore seven different sites within the study area. Each of the sites was near one of the city's signature assets and included: Main Street & the historic district, City Hall/Library, Sand Island Park, the D&L Canal, the SouthSide Arts District, South New Street & South Bethlehem Greenway, and SteelStacks. For those with less time or unable to access the sites in person, the survey could be completed entirely online.

A total of 68 people participated in the scavenger hunt, which ran from May 25 to August 31, 2021. At the end of the survey, participants had a chance to draw their own bridge on a map.

## KEY FINDINGS

- + 86% of participants feel it is somewhat or very important that the bridge connect to some of the city's historic and cultural resources. (This is further evidenced by the locations participants drew on the map at the end of the survey.)
- + About 69% of participants feel the bridge could bring the north and south side communities together.
- + 85% would like to have more alternatives to the car for commuting to work and daily errands.
- + The top activities desired along the banks of the river were: access to the water such as boat rentals, canoeing/kayaking, fishing, picnicking, and concerts/musical events.
- + When asked about features participants would like integrated into the bridge, several clear preferences rose to the top. 1) Bethlehem's rich history including the Moravian influence and Bethlehem steel integrated into public art and 2) comfortable places to sit 3) Good lighting 4) safe lanes for travel for pedestrians, bikes, wheelchairs.

**68** respondents participated in the scavenger hunt

# OF RESPONDENTS



**#1**  
45.6% participants came from 18018

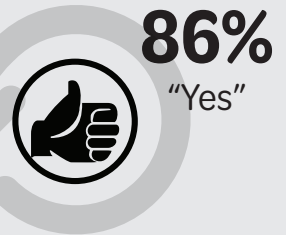
**#2**  
16.2% participants came from 18015

**#3**  
16.2% participants came from 18017

18104  
18109  
19438

OTHERS

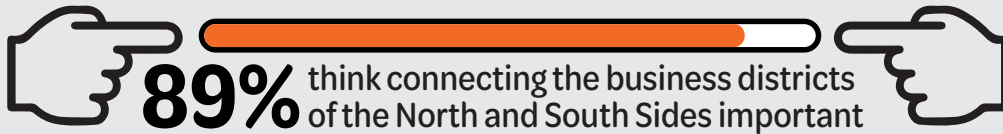
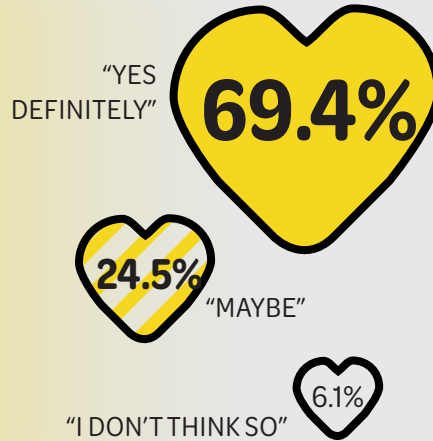
**Is it important to you that the pedestrian/bike bridge connect to some of the city's historic and cultural landmarks?**





**85%** would be interested in having more alternatives to the car for commuting to work and for daily errands

Do you think that a pedestrian/bike bridge with **seating areas** and room for **special events** can help bring the communities of the North and South Sides together?



**92%** Think it is important that the bridge incorporate public art or be designed in a way that is uniquely Bethlehem

### Most popular bridge features

- 12** Bethlehem history/art
- 5** Safe travel lanes
- 3** Space for vendors + trucks
- 7** Sitting areas
- 4** Special events programming
- 3** Viewing areas
- 6** Good lighting
- 4** Planting + natural areas

### What other activities along the banks of the Lehigh River?



Boating/kayaking



Picnicking



Concerts/Music

Strolling + Running

Formal Dining

Biking

More Places To Sit

Field Programming

Natural Areas

Fishing

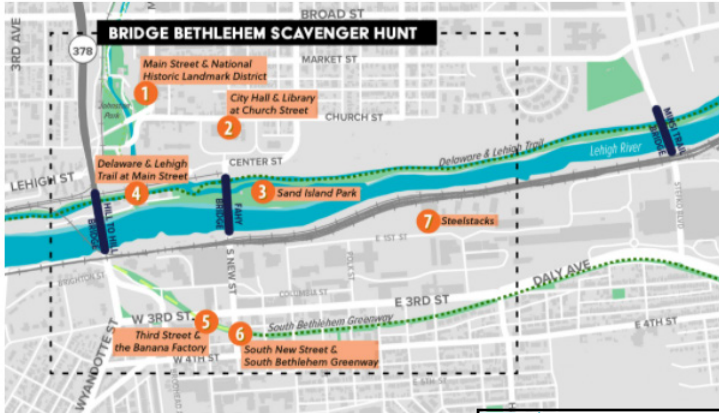
Activities For Children

FIGURE 5. SCAVENGER HUNT FINDINGS



### Bridge Bethlehem Scavenger Hunt

Join the Scavenger Hunt:



Click on the arrows below to explore each site and share your

- Site 1: Main Street & National Historic Landmark District
- Site 2: City Hall & Library at Church Street
- Site 3: Sand Island Park
- Site 4: Delaware and Lehigh Trail at Main Street
- Site 5: Third Street & the Banana Factory
- Site 6: South New Street & South Bethlehem Greenway
- Site 7: Steelstacks

### SCREENSHOTS OF VIRTUAL SCAVENGER HUNT

Participants were asked several questions about key connections and invited to share photos.

SOURCE: WRT



Steelstacks

Steelstacks is a Bethlehem landmark, defining the skyline as a tribute to the city's remarkable industrial heritage. A destination in its own right, Steelstacks and neighboring Wind Creek are the setting of many of the city's lively festivals from Oktoberfest to Musikfest.

You may feel as if you see those stacks standing at attention every day but take another look or walk along the Hoover-Mason Trestle to discover something you haven't seen before.

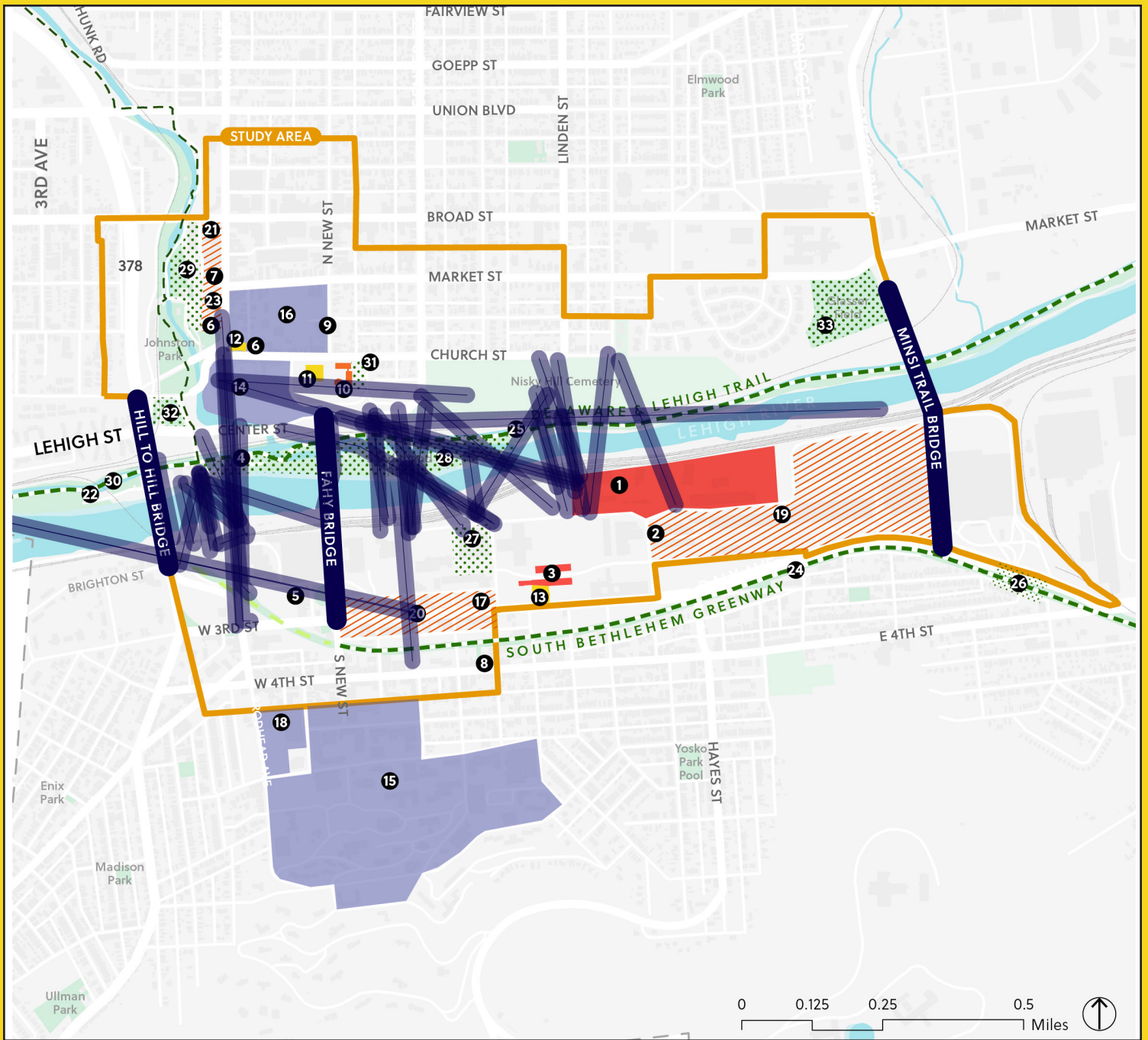
Share a photo of what you discover or your favorite view of Steelstacks.

Select image file 

Festivals and events enliven the city year-round. Connecting the North and South Sides with a safe walking route could make it easier for festival-goers to visit both sides of the river and create opportunities for performances and vendors on the bridge. What sorts of features would like to see integrated into the bridge design?

1000





**FIGURE 6. VIRTUAL SCAVENGER HUNT**

Participants were invited to indicate where they would like to see the pedestrian bridge located.

# FOCUS GROUPS

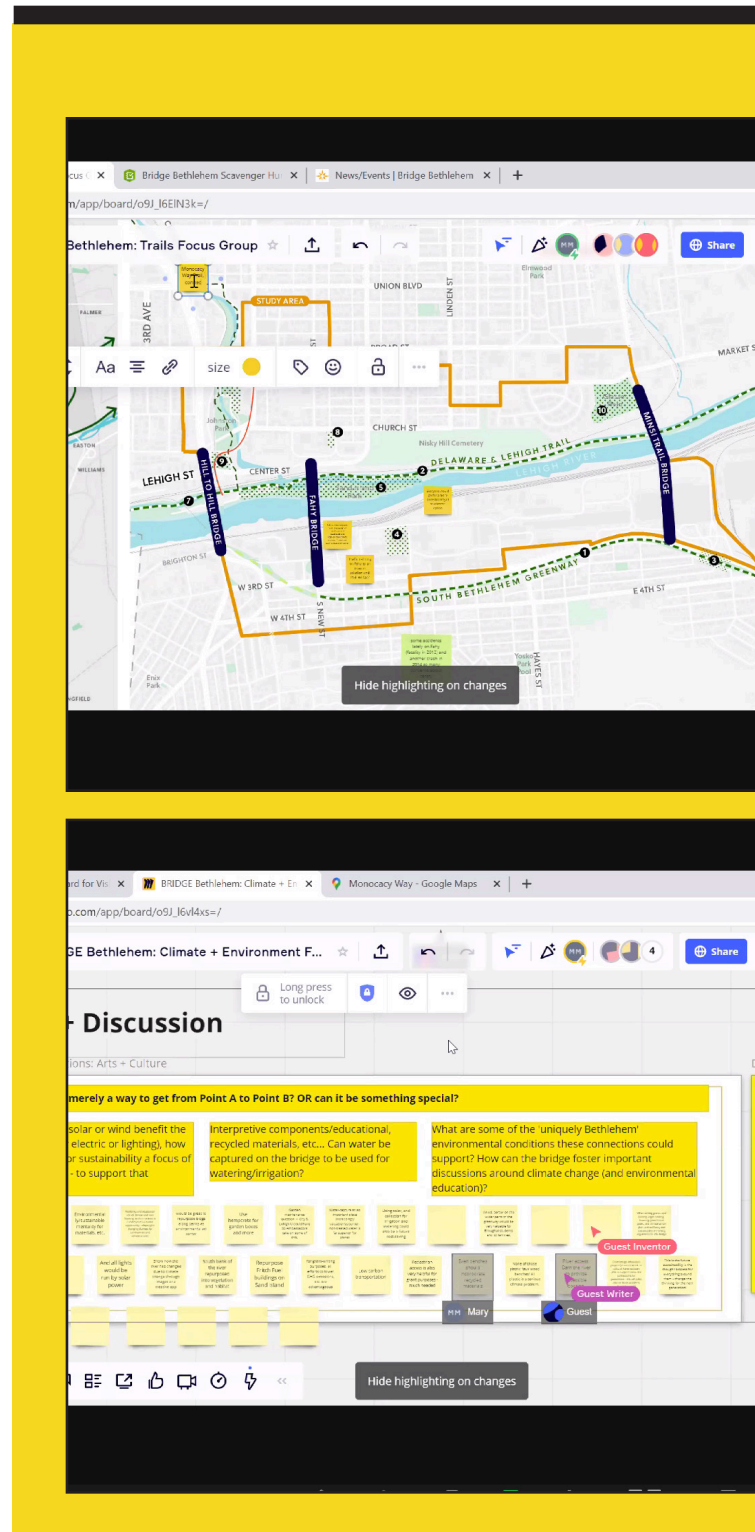
To explore the potential of a safe pedestrian and bike connection across the Lehigh River from the perspective of different stakeholder groups, the consultant team conducted a series of topic-focused discussions centered around four distinct lenses:

- + Arts & Culture
- + Business & Economic Development
- + Climate & Environment
- + Trails & Recreation

The virtual discussions employed a digital workspace that enabled participants to collaborate around shared maps, images, and graphics on which they could make comments and notations individually and as a group.

Discussions explored what stakeholders felt the bridge could be—merely a safe pedestrian, bike, scooter, wheelchair, skateboard crossing from one side of the river to the other? Or should it be more than that? Participants discussed how the city could begin to face and harness the river instead of turning its back on it.

The groups also identified key assets (historic landmarks, arts and cultural venues, business hubs, existing trails) on the north and south sides that the bridge should try to connect. And lastly, participants explored specific ways the crossing could support the aspirations of these distinct stakeholder groups and enhance the quality of life for all of those visiting, living, and working in Bethlehem.



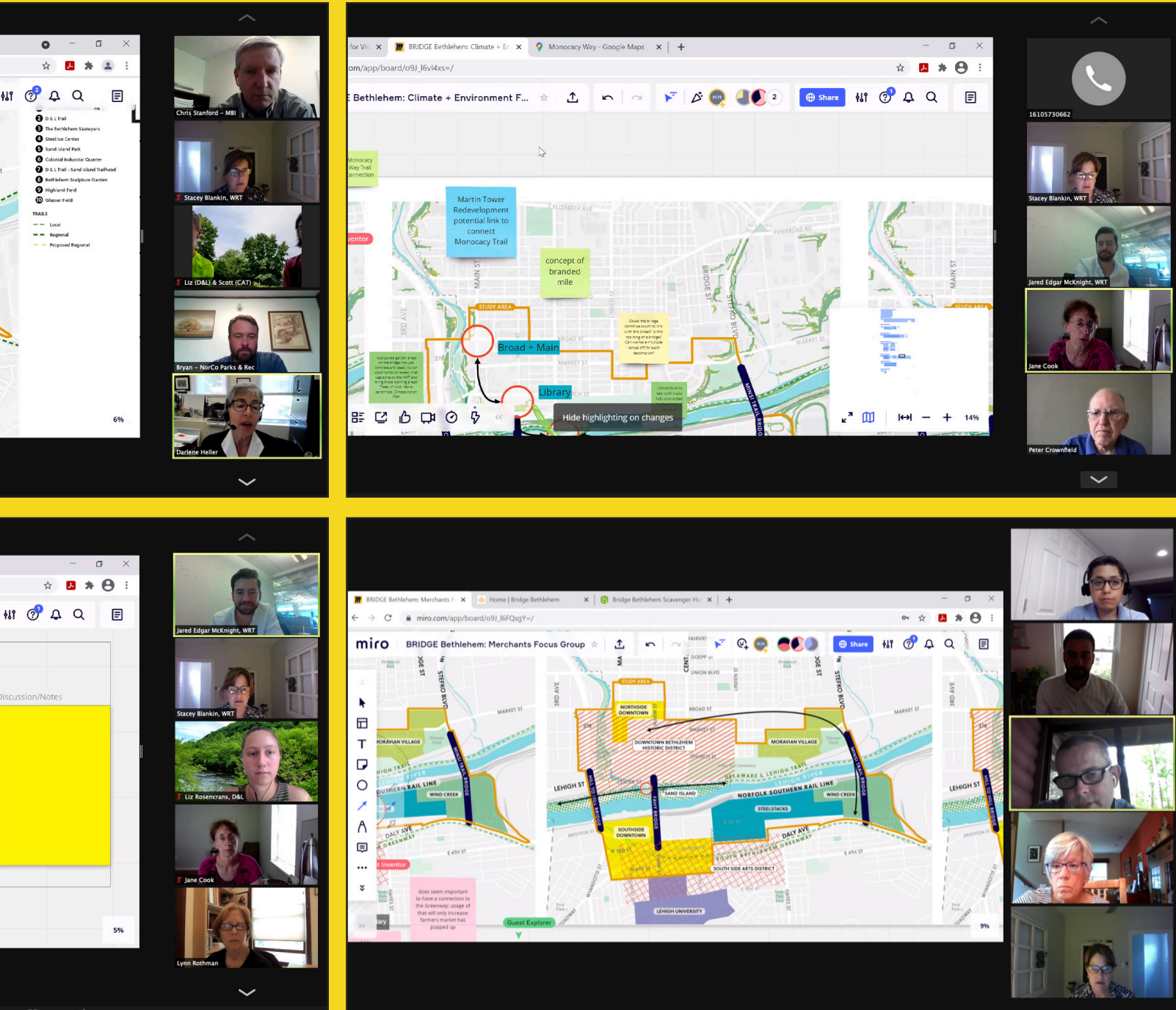


FIGURE 7. VIRTUAL FOCUS GROUP DISCUSSIONS

Using the online collaboration tool Miro Board, stakeholders were able to share their thoughts and sketch ideas in real time.



## FOCUS GROUP 1: ARTS & CULTURE

Date: July 14, 2021 | 1:00 to 2:30 pm



**PARK UNION BRIDGE, COLORADO SPRINGS  
DESIGNED BY DILLER SCOFIDIO + RENFRO**

SOURCE: JASON O REAR, IWAN BAAN; ARCHDAILY.COM

### PARTICIPANTS:

- + Stacey Blankin, WRT
- + Stacie Brennan, Lehigh University Arts Gallery
- + Hannah Clark, Michael Baker International
- + Yadira Colon-Lopez, CADC-B
- + Keiko Cramer, WRT
- + Barbara Fraust, Fine Art Commission
- + Lisa Harms, ArtsQuest Director Visual Arts & Education
- + Darlene Heller, City of Bethlehem Director of Planning & Zoning
- + Woo Kim, WRT
- + Glenn Koehler, South Side Film Festival
- + Jared McKnight, WRT

### KEY TAKEAWAYS:

#### Build upon existing assets, such as:

- + First Friday synergies:
  - Banana Factory is activated as well as Third Street during First Friday.
- + Urban Arts Trail Walk (SouthSide Arts District): <https://southsideartsdistrict.com/urban-arts-trail/>
- + Public Arts Trail (SouthSide) – would like to provide a future connection on the North Side
  - South Bethlehem Greenway has plans for pop up events that could be incorporated into a 2+ mile walking tour.
- + Connect to galleries, Mural Walks, Education/Schools, historic corridors, recreation (such as the skate park), and other assets.
- + Consider connections to areas that showcase Bethlehem’s diversity such as:
  - The four blocks International neighborhood—Historic/Commercial District between Filmore & Hayes Streets
  - Ethnic/Social Clubs—Portuguese, Puerto Rican clubs
- + “Bridgewalk”—create a mobile tour app that could tie into shows at the Mill, new murals, streetscape, etc.

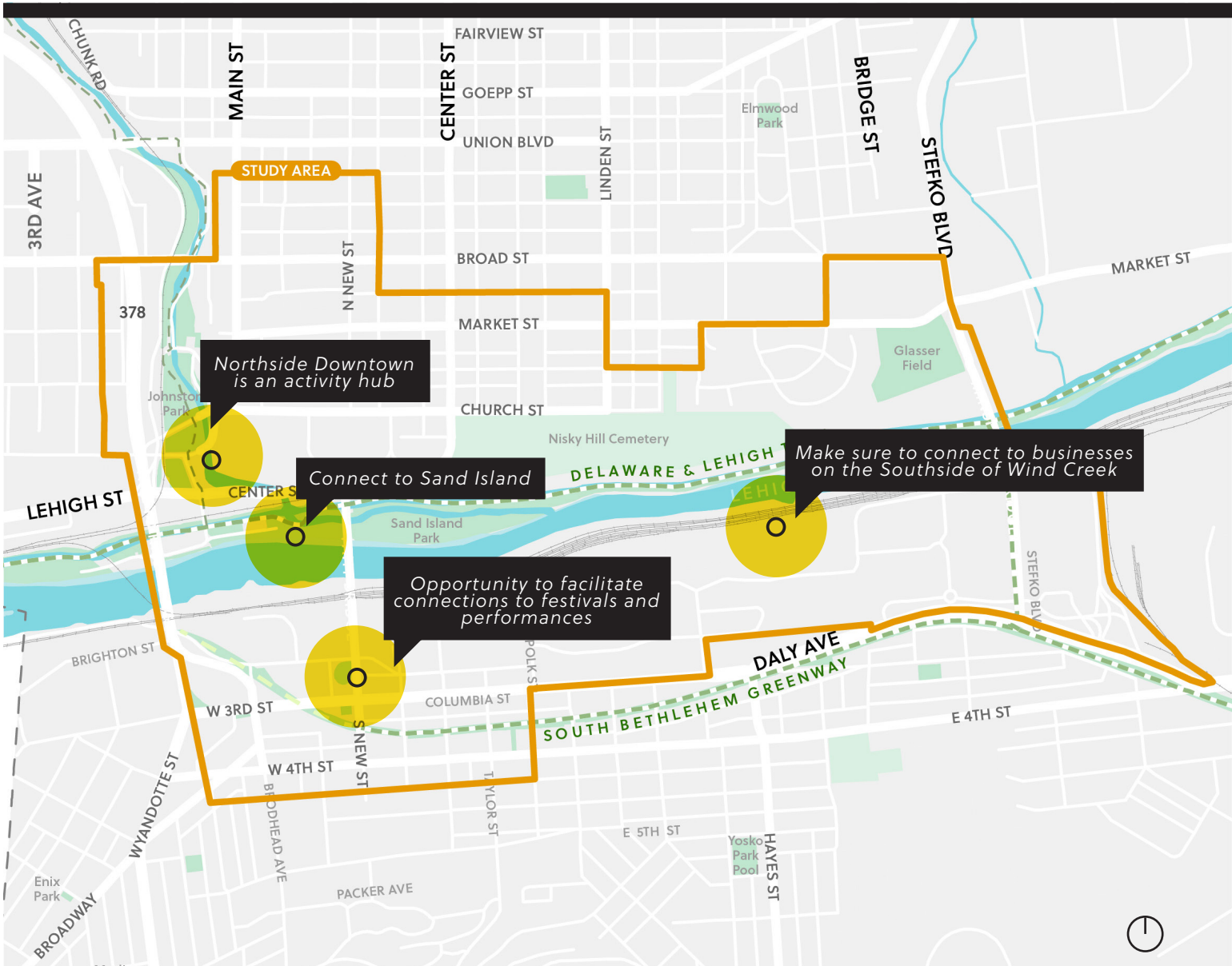
#### Constraints to consider:

- + Parking and access to the bridge, particularly for special events, will be important to consider.

#### Other considerations:

- + The bridge would be an asset to the photography community with potential views of SteelStacks, downtowns, and water.
- + Harness the opportunity to get closer to the water, providing educational programming (such as highlighting climate change in real time), and a place for historical exploration.
- + Create a venue for marathons, races, parades over the bridge.





**ARTS & CULTURE SUMMARY:**

**FIGURE 8. ARTS AND CULTURE SUMMARY MAP**

Bethlehem is replete with year-round cultural programming. This bridge has the potential to create new connections to Bethlehem’s festivals, arts institutions, and gathering spaces. Incorporating public art and new spaces for festivities on the bridge will create an iconic and inspiring symbol for the community.

The bridge alignment should thoughtfully connect with existing activity hubs such as the Northside Downtown, Public Arts Trail, South Bethlehem Greenway, SteelStacks, and others.

## FOCUS GROUP 2: CLIMATE & ENVIRONMENT

Date: July 19, 2021 | 10:00 to 11:30 am



**GREEN INFRASTRUCTURE - RAIN GARDEN**

SOURCE: PHILADELPHIA ZOO

### PARTICIPANTS:

- + Stacey Blankin, WRT
- + Jane Cook, Monocacy Creek Watershed Association
- + Keiko Cramer, WRT
- + Peter Crownfield, Alliance for Sustainable Communities
- + Kathy Fox, Food Co-op
- + Michael Harrington, Monocacy Creek Watershed Association
- + Darlene Heller, City of Bethlehem Director of Planning & Zoning
- + Jared McKnight, WRT
- + Liz Rosencrans, Trail Tenders / D&L Canal
- + Lynn Rothman, Environmental Advisory Council Chair
- + Dan Sobrinski, WSP (Climate Action Plan)
- + Chris Stanford, Michael Baker International
- + William Wellington, WRT

### KEY TAKEAWAYS:

#### Build upon existing assets, such as:

- + Wetlands are very important—consider upgrading some of existing wetlands, or adding a boardwalk/riverwalk educational component through wetlands.
- + Sand Island—consider re-purposing the West End to make it more inviting for users.
- + Future economic development is anticipated along Broad Street (North Side).
- + Connect to the South Bethlehem Greenway.
- + Enhance the Southside and connections that do not require traveling to the North Side to access parks and amenities.
- + Consider a connection from SteelStacks to Polk Street to Payrow Plaza.

#### Constraints to consider:

- + Flooding from Lehigh River and Sand Island.

#### Other considerations:

- + Are there ways to slow the water with dams to make it more boater friendly before Minsi Bridge?
- + Wetlands are integral to climate action and ecology and the bridge should avoid disturbing them. Are there ways to incorporate enhancements such as a boardwalk to create an educational interface with them?
- + Could the bridge tie into a fishing pier and boat launch or floating dock?
- + Design along the Canal needs to maintain historical structure.
- + Incorporate garden areas on the bridge (not just concrete and steel). This is an opportunity to expand on Hoover-Mason Trestle—trees, shrubs, native perennials while supporting the City’s Climate Action Plan.

## CLIMATE & ENVIRONMENT SUMMARY:

Bethlehem has the opportunity through this bridge to embrace the Lehigh River as more than a dividing line to be crossed. Connecting to the river, parks, and major regional trails (such as the D&L and South Bethlehem Greenway) can foster healthier lifestyles and environmental stewardship.

A new pedestrian bridge can inspire new perspectives on the river and it's unique characteristics. Connecting to the water at existing and new points, one may gain new insight into the wildlife and industry it has influenced. From the bridge, residents and visitors will have a new vantage point to see the dynamism of the Lehigh River over the four seasons while immersed in unique natural spaces on the bridge.

### **Integrate sustainability into the physical bridge:**

The bridge itself can be exemplary of the sustainable future outlined in the Climate Action Plan. Using solar power for lighting, water catchment, and other environmentally-minded materials, we can create a prototype of green infrastructure for the city. Where possible, furniture and fixtures should be constructed from recycled or non-plastic materials. Bio-materials such as hempcrete could be used for planters and garden boxes.

### **Catalyze sustainable redevelopment:**

Where the bridge connects with the urban fabric, areas can be enhanced and redeveloped along these principles. Buildings such as Fritch Fuel on Sand Island can be reused. Creating more routes for cyclists in the city can reduce automobile commuting. Areas along the river bank can be naturalized and showcase native habitats. New vegetation and habitat can be particularly impactful along the Southside riverfront.

## MORE THAN JUST A BRIDGE:



**Alternative Transit/  
Ways of Traveling**



**Reducing Environmental  
Impact of the Bridge**



**Touching the Water/  
Connecting to Nature**



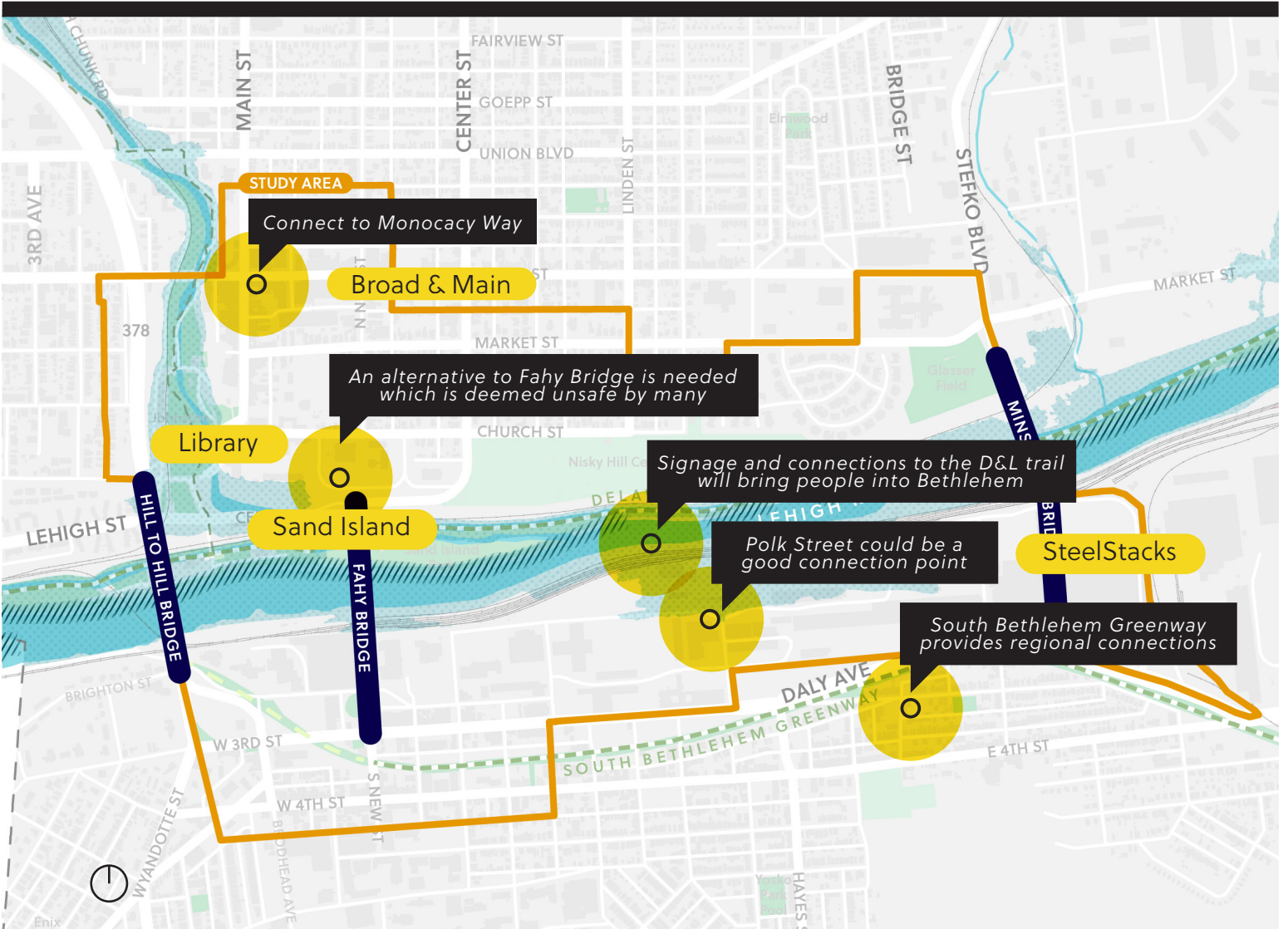


FIGURE 9. CLIMATE & ENVIRONMENT SUMMARY MAP







## FOCUS GROUP 3: BUSINESS & ECONOMIC DEVELOPMENT

Date: July 19, 2021 | 3:30 pm to 5:00 pm



**SHORT-NORTH ARTS DISTRICT**

SOURCE: EXPERIENCE COLUMBUS

### PARTICIPANTS:

- + Stacey Blankin, WRT
- + Yasmin Bugaighis, Moravian University, Facilities Management
- + Matthew Forbes, Wind Creek
- + Bruce Haines, Aardvark Sports Shop
- + Darlene Heller, City of Bethlehem Director of Planning & Zoning
- + Woo Kim, WRT
- + Jared McKnight, WRT
- + Donna Taggart, Southside Resident
- + William Wellington, WRT

### KEY TAKEAWAYS:

#### Build upon existing assets such as:

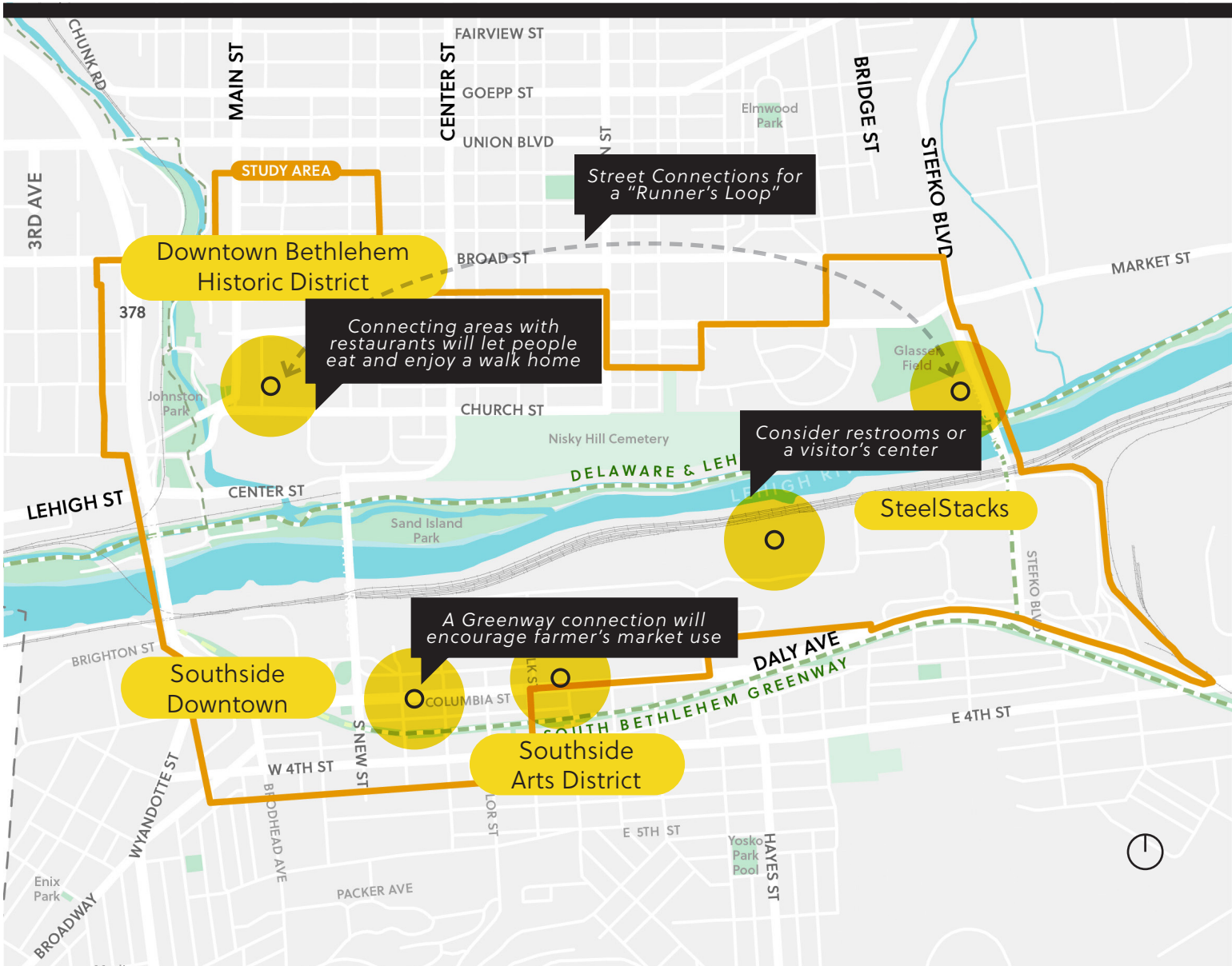
- + Some South Bethlehem are utilizing the Greenway and bridges to walk to work but would welcome a safer route over the river.
- + Bethlehem is a city festivals that could “spill over” onto the bridge. The bridge could also make it easier for festival goers to move through the city from venue to venue.
- + With a number of regular running groups, the bridge should connect to key points to complete a citywide circuit. Some popular routes include:
  - The tow path on Sand Island.
  - Circuit from Main Street to Market Street, Minsi Trail Bridge, South Bethlehem Greenway, Hill to Hill Bridge and back to Main Street.
  - The Minsi Trail Bridge through SteelStacks.
  - Some races leave from ArtsQuest; other leave from Main Street.
- + North Side Thursday events.
- + Southside First Fridays.
- + Connect residential areas to popular dining locations on either side of the river.

#### Constraints to consider:

- + Currently there is a lack of public restrooms and visitor amenities.
- + Vehicular access, plumbing, and electricity should be considered to support events such as farmers markets or festivals.

#### Other Considerations

- + Creating a bridge with branches or multiple spans/ramps that can access residential and commercial areas. Connecting the North Side with ArtsQuest/Wind Creek could create a loop through the city.
- + The North Side should have a connection as close to downtown as possible.
- + It should include signage and public realm elements that help direct people to the bridge and nearby activity hubs.
- + Restrooms and a visitor center on the North Side are desired.
- + It is important to have a connection to the Greenway; usage of that will only increase; a farmers market has popped up.
- + Historical markers and interpretive signage are desired.



## BUSINESS & ECONOMIC DEVELOPMENT SUMMARY

FIGURE 10. BUSINESS AND ECONOMIC DEVELOPMENT SUMMARY MAP

Strengthening the connection between Bethlehem’s two downtowns and nearby residential neighborhoods will increase livability and promote local commerce. The new bridge should be equipped with wayfinding and signage that promote nearby landmarks and shopping districts to local and out of town visitors. Ramps or access points at existing trails such as the D&L Trail and South Bethlehem Greenway will encourage use by cyclists, runners, and walkers. These users are likely to access nearby shops and restaurants. With visitor amenities and built in infrastructure such as water, the bridge may also encourage on-site commerce in the form of farmers markets, festivals, and other events.



## FOCUS GROUP 4: TRAILS & RECREATION

Date: July 22, 2021 | 10:30 am to 12:00 pm



**“FREE BOATING” ON THE SCHUYLKILL  
AT BARTRAM’S GARDEN**

SOURCE: BARTRAM’S GARDEN

### PARTICIPANTS:

- + Stacey Blankin, WRT
- + Rosa Carides-Hoff, Community School Coordinator
- + Hannah Clark, Michael Baker International
- + Brian Cope, Northampton County Parks & Rec Superintendent
- + Irene Follweiler, Recreation Commission Chair
- + Darlene Heller, City of Bethlehem Director of Planning & Zoning
- + Jared McKnight, WRT
- + Don Miles, Sierra Club
- + Charles Richards, PennDOT Bike & Ped Coordinator
- + Liz Rosencrans, Trail Tenders / D&L Canal
- + Scott Slingerland, Coalition for Appropriate Transportation Executive Directory
- + Chris Stanford, Michael Baker International

### KEY TAKEAWAYS:

#### Build upon existing assets such as:

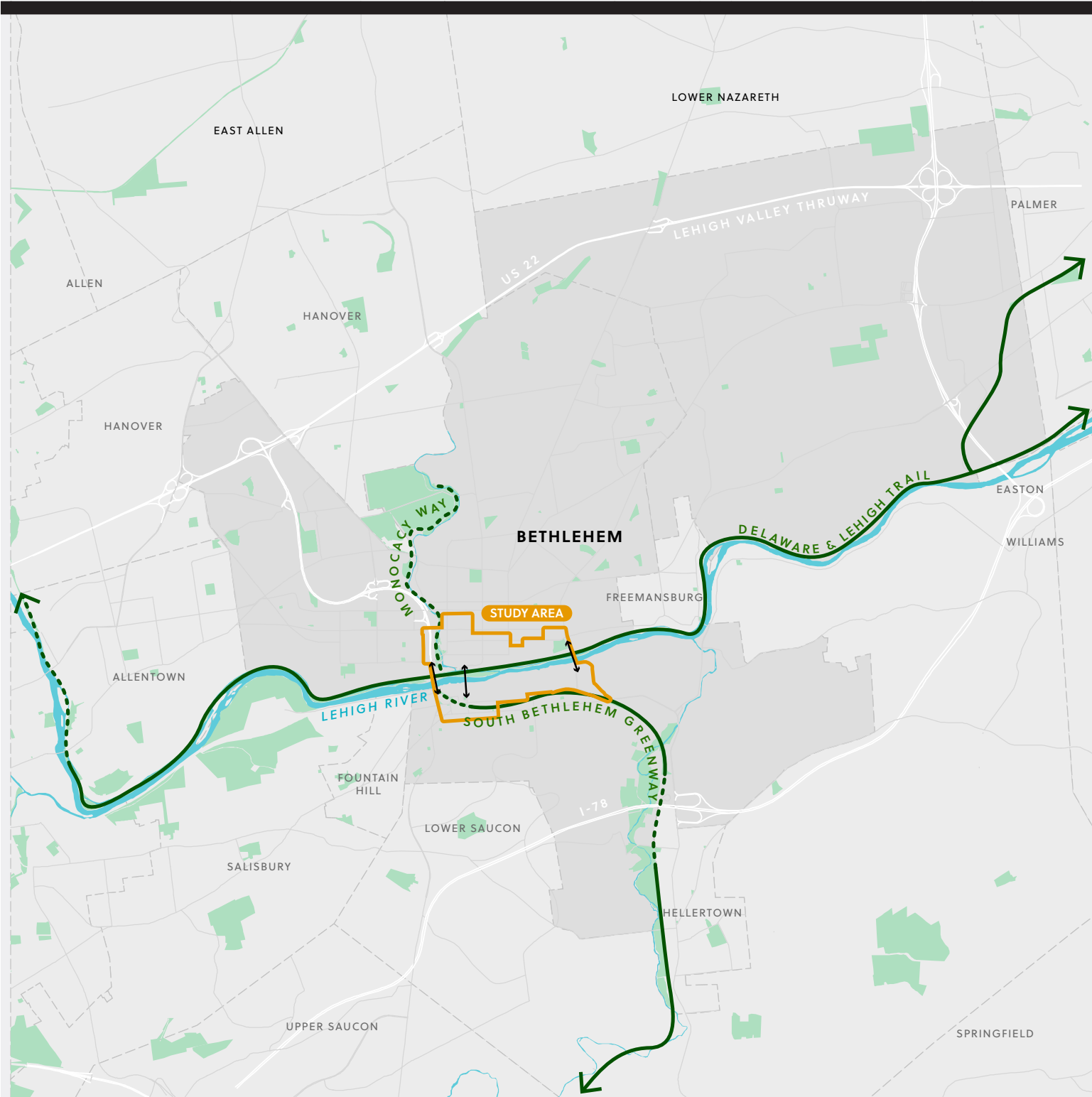
- + Regional trail routes can connect to the bridge and make Bethlehem a stop along the way. Tourists on long treks can use the trail system, and connect to this area of Bethlehem on both sides of the city. Some examples include Jim Thorpe to Easton and the World Trade Center to Pentagon to Flight 93 (9/11 Trail).
- + Close trail gaps and make connections to other destinations such as:
  - D&L Trail is a major connector through the region.
  - South Bethlehem Greenway south to Saucon Rail Trail (towards Bucks County).
  - Monocacy Way Trail, connecting to D&L Trail at Sand Island (northern end in progress).
- + Cycling can promote tourism for the city (visitors accessing nearby mountain areas or other cities can start or end their trip in Bethlehem.) Bethlehem is well positioned with hotels, stores, and restaurants.

#### Constraints to consider:

- + Perception of trails—many only use area trails for recreation as opposed to a way to get to a destination or employment.
- + None of the existing bridges are bicycle safe.
- + There is limited access to new and existing developments. One example, the Martin Tower site, is anticipated to have over 300 residential units. A trail should be incorporated.
- + Safe and visible on-street crossings must be a priority. The crossing between Illick’s Mill and Burnside at Shoenersville Road is very dangerous.

#### Other Considerations

- + Branding: Trail towns and trail-friendly businesses are a great way to spread the word to people who plan travel around recreation.
- + Think about the bridge as a destination with areas designed for school classes, live music, vendor kiosks, interpretation about history, concessions at both ends, etc.).
- + Design the bridge as a launching off point for people to learn about and experience the river.



**REGIONAL TRAIL MAP**

SOURCE: WRT

- + Maximize connectivity to other destinations, amenities, and civic spaces such as the skate park.
- + Explore the potential of the bridge as a health opportunity for the community, supporting wellness programs for residents.





## TRAILS SUMMARY

Few cities can boast the access to trails that Bethlehem can. With the ongoing expansion of the regional trail system (Saucon Rail Trail, Monocacy Way, South Bethlehem Greenway, and more!) The bridge will provide a pivotal access point between different trail systems and to the city for its users.

Bethlehem has the opportunity to market itself as mile marker 0 on a circuit of trails including historic routes such as the 9/11 National Memorial Trail and D&L Trail. Leveraging its position and the traffic of local and visiting cyclists, Bethlehem can entice active tourism and use the bridge as a place to start, end, and rest when using one of these trails.

Just as important as the land routes, the bridge also will provide a chance to interact with the Lehigh River. With complementary boardwalks or small-craft launching points, the river itself may become a spoke on the wheel of recreational routes centered on Bethlehem.

SOURCE: WRT



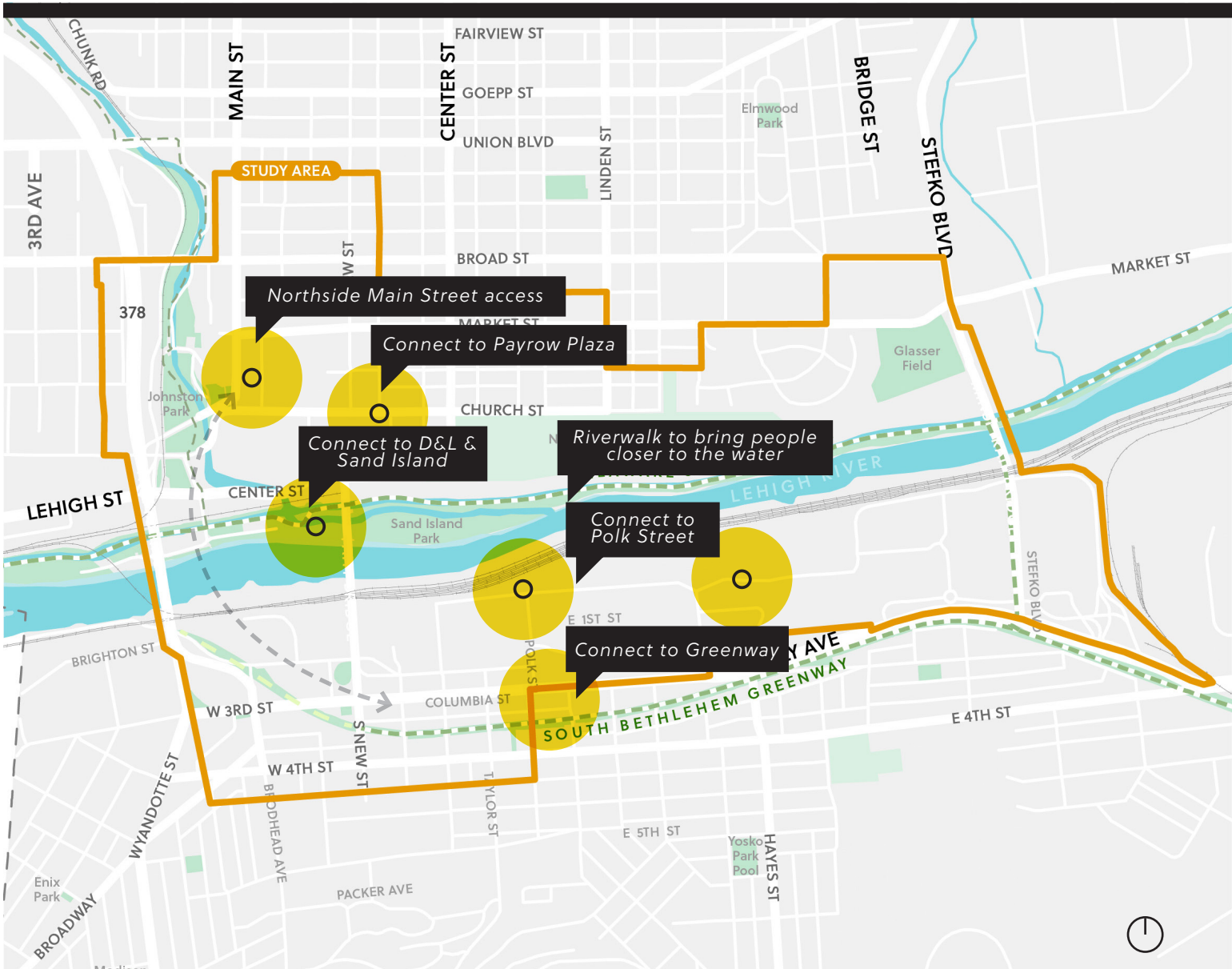


FIGURE 11. TRAILS & RECREATION SUMMARY MAP

# COMMUNITY CONVERSATIONS

## MEETING 1: NORTH SIDE OPEN HOUSE

Date: October 1, 2021 | 2:00 pm to 4:00 pm

Location: Front Patio of 60 West Broad Street

## MEETING 2: SOUTHSIDE OPEN HOUSE

Date: October 1, 2021 | 5:00 pm to 7:00 pm

Location: South Bethlehem Greenway at New Street



ON THE NORTH SIDE, THE PLANNING TEAM EXPLORED IDEAS WITH PASSERSBY.

SOURCE: WRT

## CONTINUING THE TRADITION OF CIVIC DIALOGUE

On October 1, 2021, the planning team facilitated two community conversations to share progress on the Pedestrian Bridge Feasibility Study and to gather additional feedback.

The first conversation took place on the North Side, outdoors on the patio of 60 W. Broad Street. In the evening, the team set up on the South Bethlehem Greenway in conjunction with First Friday.

A series of banners provided an overview of the Feasibility Study, explaining how it came about, the process, deliverables and comments shared by the community to date. Based on the first Virtual Town Hall Meeting and the Scavenger Hunt, a set of guiding principles started to take shape. These principles were also introduced to the community for consideration.

Other interactive activities included map-based exercises exploring potential connections and locations for the footings of the bridge, in addition to examining preferred features and a Draw-Your-Own Bridge exercise for young community members.

# EMERGING GUIDING PRINCIPLES:

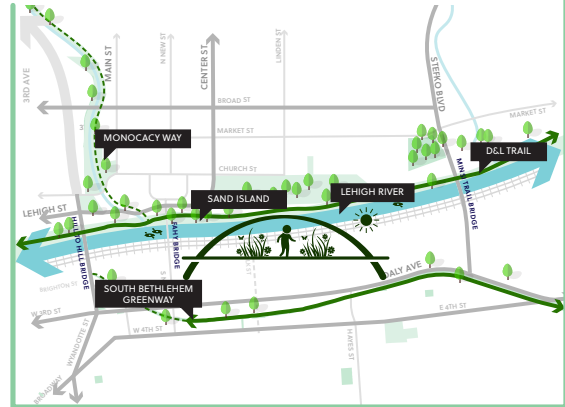
## → A CATALYST FOR VITALITY

Form a vibrant gateway that harnesses the city's hotels, restaurants, historic sites, artistic and musical venues, and recreational assets to boost economic vitality citywide [Northside + Southside].



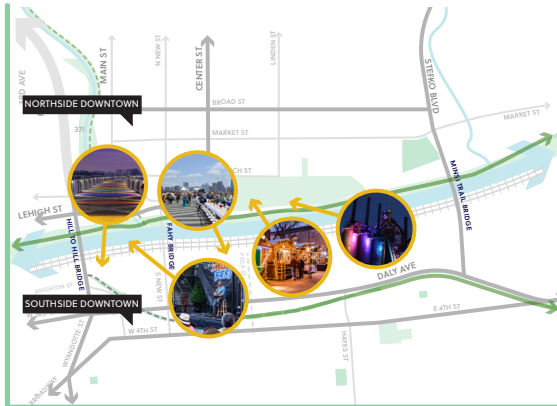
## → SUSTAINABLE + RESILIENT

Demonstrate and inspire a more sustainable lifestyle by fostering a walkable city, integrating renewable sources of materials and energy into the bridge, and strengthening connections between people and nature.



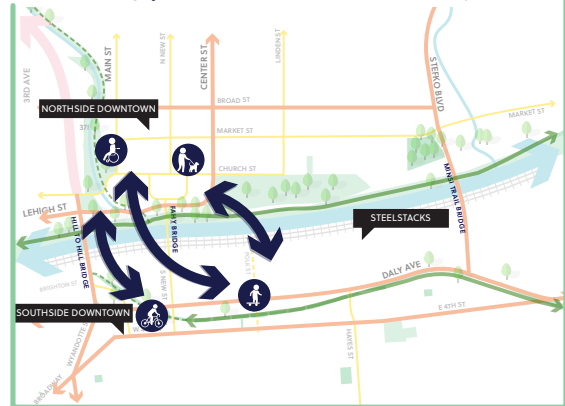
## → A CULTURAL CANVAS

The connection should be a destination that is both iconic and distinctly Bethlehem, reflecting the city's history and artistic culture, and designed as both a conduit to connect, and a canvas to support programs and events from one side to the other.



## → SAFE + WELL-CONNECTED

Create a connection across the Lehigh River between the North and South sides that safely accommodates a full range of users (cyclists, scooters, wheelchairs, pedestrians), filling in a vital link in the regional trail network and connecting points of interest in the city.

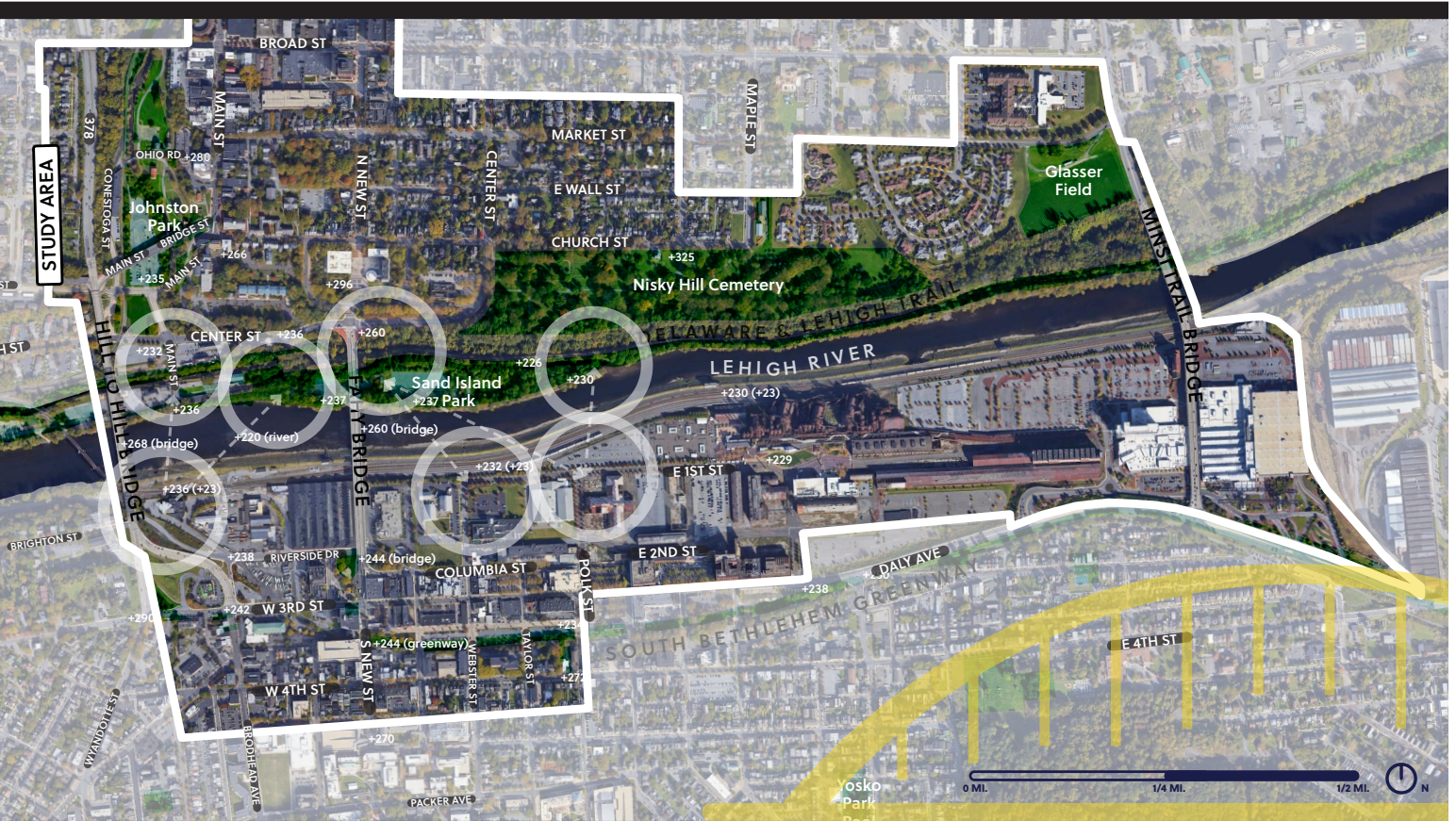


## EMERGING GUIDING PRINCIPLES SUMMARY

The consultant team explained that a series of priorities or principles emerged from the feedback gathered so far. While the ultimate location of the proposed bridge alternatives will need to take into account a number of technical and financial considerations, these priorities are also important to guide the conceptual development and evaluation of the bridge scenarios. Community members were invited to give simple feedback on these principles in the form of comments on sticky notes.

FIGURE 12. A WORKING SET OF GUIDING PRINCIPLES WAS PRESENTED ON THE INTRODUCTORY BANNERS DURING THESE POP-UP CONVERSATIONS.





**FIGURE 13. MAPPING ACTIVITY AND COMMUNITY FEEDBACK**

## EXPLORING MULTIPLE CONNECTIONS & TOUCH POINTS

The first mapping exercise asked the community to explore different key connection points north and south of the Lehigh River to better understand where people would like to go once they land on either side.

This map included elevation levels to begin to explore the steep changes that will need to be addressed by tools such as ramps and elevators. This exercise also began to explore multiple touch points that the bridge might have on both sides of the river, illustrating how the form of the bridge may not be a straight line.

Participants explored various connection points across the river and within the existing city fabric by drawing a variety of scenarios with the consultant team.



# IMAGINE THE POSSIBILITIES



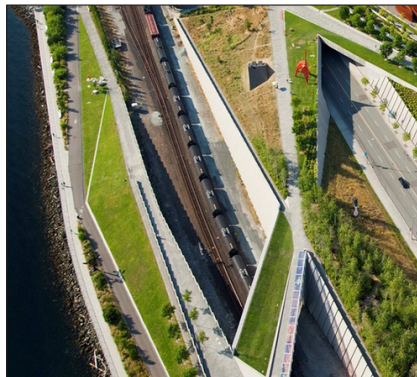
Environmental education (Sand Island)



Landscaped Areas (Leading to Bridge)



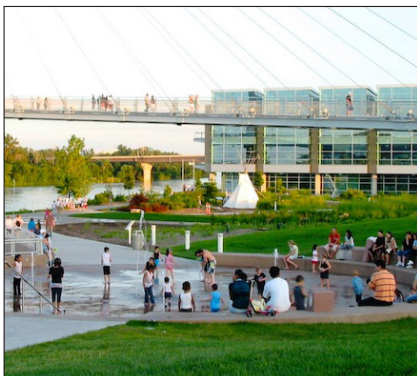
Bike share



Landscaped Area (Along River's Edge)



Serpentine Path (Payrow Plaza)



Civic/Event Space (At Bridge Footing)



Water Play



Recreational Areas

FIGURE 14. TOOLKIT BOARDS

Three reference boards comprised a toolkit of visual examples of different types of ramps, elevators, bike lane typologies, crosswalks, signage, etc. The toolkit was used to inform the discussions by illustrating how a variety of connections to the bridge could be designed.





FIGURE 15. MAPPING ACTIVITY AND COMMUNITY FEEDBACK

## IDENTIFYING PREFERRED ANCHOR POINTS

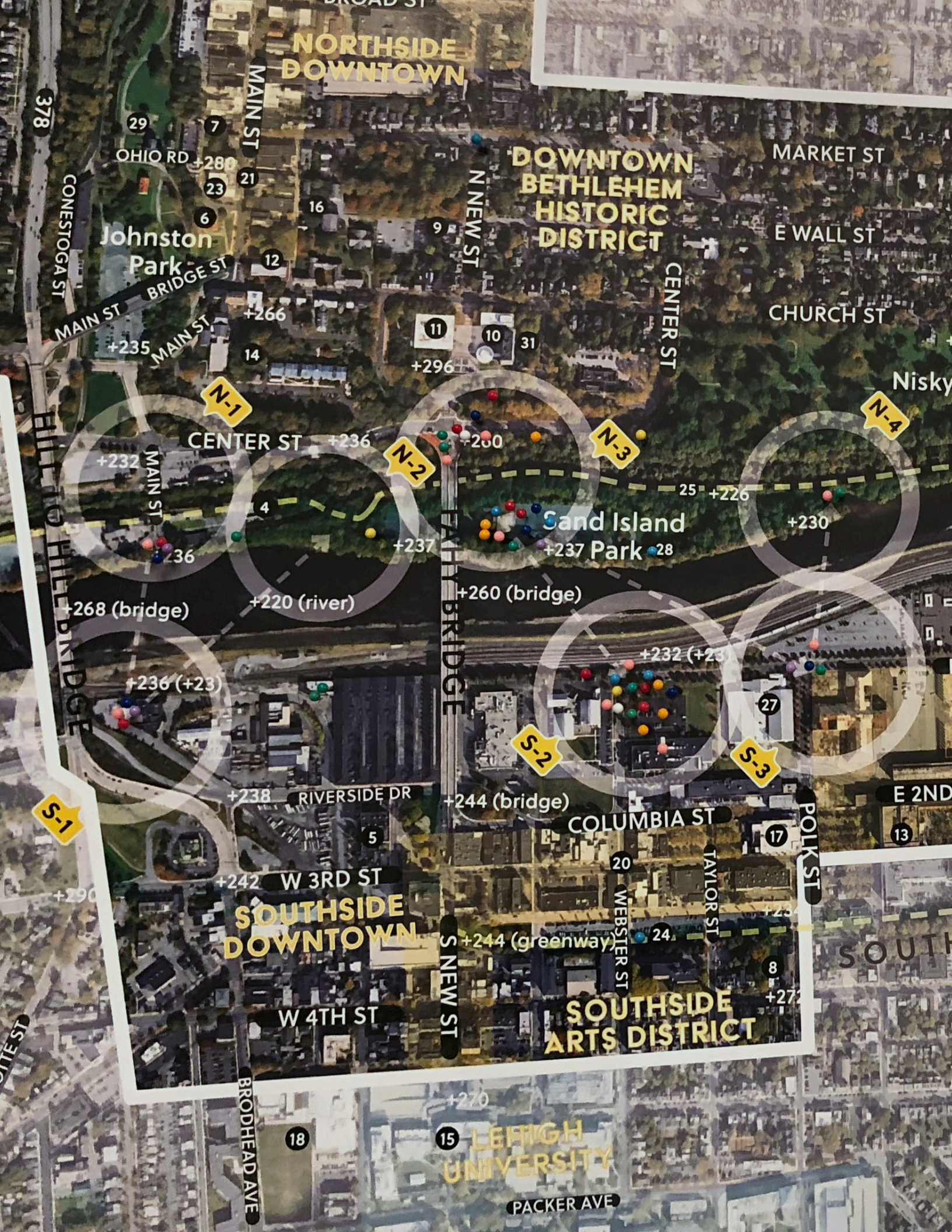
The second mapping exercise invited participants to select one preferred anchor point for the bridge on the north side and one on the south side of the river.

The numbers shown on the map above indicate the preferred locations. On the south side, there was a clear preference for the area labeled S-2 at Webster Street and 1st Street.

On the north side, there was a clear preference for the area numbered N-3 but within the circle, there was a cluster of pins on Sand Island and another by the intersection of New and Center streets (see the image at right).

Using pins, community members indicated their preferences for the landings of the bridge.





**NORTHSIDE DOWNTOWN**

**DOWNTOWN BETHLEHEM HISTORIC DISTRICT**

**SOUTHSIDE DOWNTOWN**

**SOUTHSIDE ARTS DISTRICT**

Johnston Park

Sand Island Park

LEHIGH UNIVERSITY

378

29

7

23

6

16

12

+266

14

11

10

31

+296

CENTER ST +236

N-2

N-3

N-4

+232  
MAIN ST

4

+237

+260 (bridge)

25 +226

+230

+268 (bridge)

+220 (river)

+236 (+23)

+232 (+23)

S-1

S-2

S-3

+238 RIVERSIDE DR

+244 (bridge)

E 2ND

COLUMBIA ST

+290

+242 W 3RD ST

5

20

17

W 4TH ST

+244 (greenway)

WEBSTER ST

TAYLOR ST

8

SOUTH

BROADHEAD AVE

15

PACKER AVE

18

+270











PLACE A DOT BELOW THE SLIDING SCALE WHETHER YOU AGREE/DISAGREE WITH THE FEATURES

### HISTORY, ARTS, CULTURE



### DESTINATION & GATEWAY



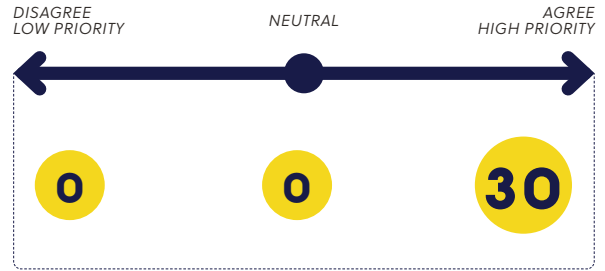
### TRAILS & RECREATION





AS PRIORITIES FOR THE PEDESTRIAN BRIDGE:

## SUSTAINABILITY & RESILIENCY



## SOCIAL INTERACTION & EVENTS



## CONNECTION TO THE RIVER & NATURE

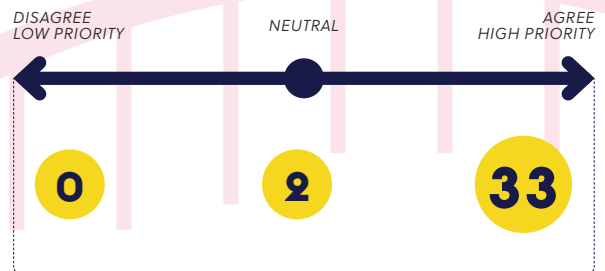


FIGURE 16. USING DOT VOTING, THE COMMUNITY EXPRESSED THEIR PREFERENCES FOR THE CHARACTER AND FEATURES OF THE NEW BRIDGE.

## PRIORITY FEATURES AND CHARACTER SUMMARY

This visual preference exercise illustrated a variety of features and functions the bridge could provide. Participants were asked to weigh in on how much of a priority each function is to them by placing a dot on the scale indicating either a low, neutral, or high priority. Overall, all six of the categories are important to those who participated. The top features include: forming a connection to the river and nature; embracing sustainability and resiliency; and providing trails and recreation, which is consistent with previous feedback gathered.

PLACE A POST-IT NOTE IN THE BOX BELOW TO SHARE YOUR INPUT, OR

Public art on the bridge

Retaining wall along Center Street

Parking near the bridge on both sides of the river

Make City Hall more accessible

Provide good signage

Safer routes for prominent races (1/2 and full marathons)

Use circular ramps

Connect Greenway to D&L

Provide a connection to the river

Family-friendly crossings



New ways to commute!



I want more connections!





WHAT WE ARE MISSING!

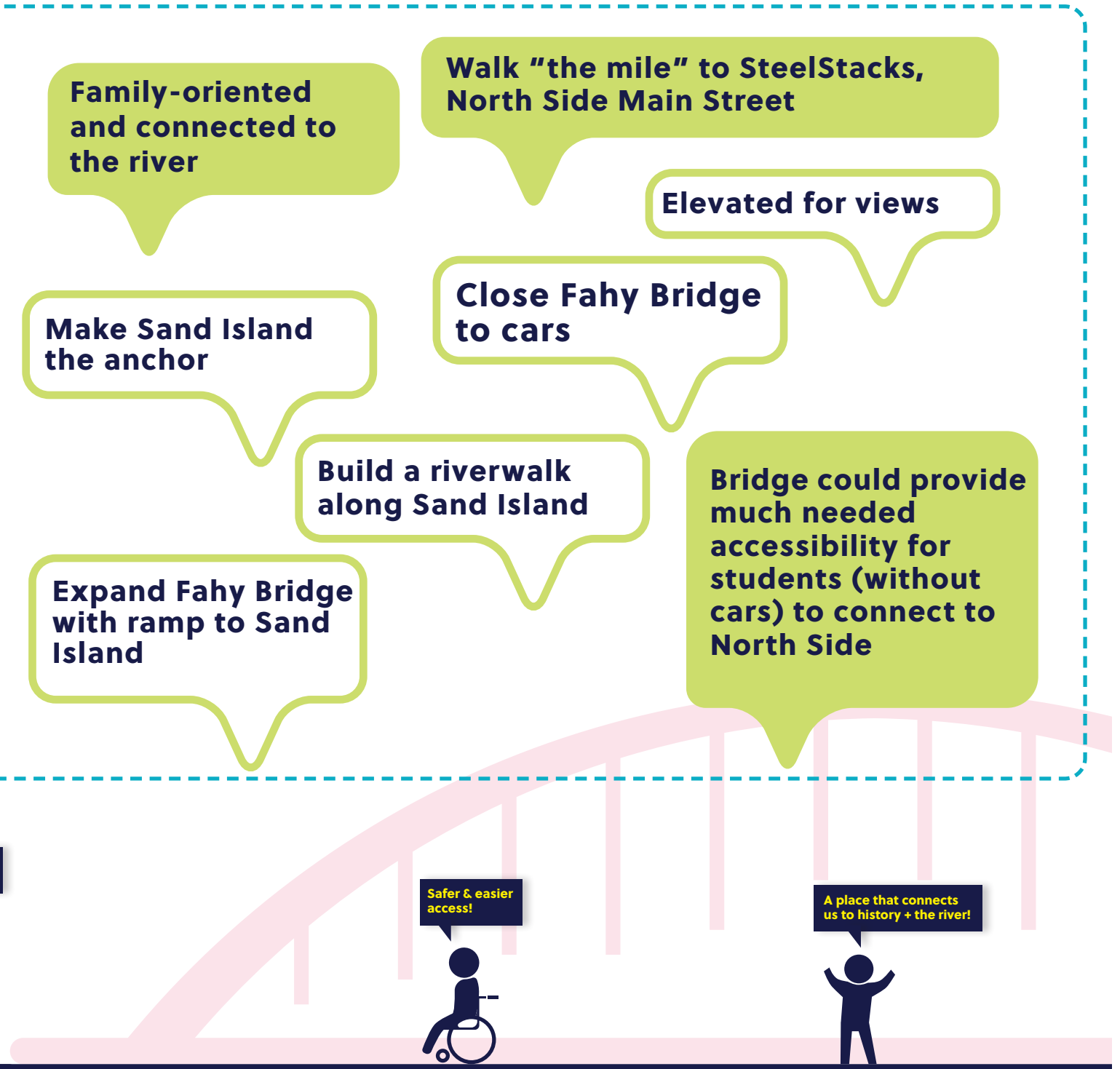


FIGURE 17. USING STICKY NOTES, THE COMMUNITY SHARED ADDITIONAL IDEAS FOR THE NEW BRIDGE.



NOW OPEN!  
MITCHELL BRANCH  
CHILDREN'S  
CENTER

NOW OPEN!  
MITCHELL BRANCH  
CHILDREN'S  
CENTER

NOW OPEN!  
MITCHELL BRANCH  
CHILDREN'S  
CENTER

LITTLEVILLE AREA  
PUBLIC LIBRARY



3

# GUIDING PRINCIPLES

 **Bethlehem**  
Area Public Library  
1901 Celebrating 100 years 2001

100th Anniversary  
1901-2001

100th Anniversary  
1901-2001

100th Anniversary  
1901-2001

100th Anniversary  
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1901-2001

100th Anniversary  
1901-2001

100th Anniversary  
1901-2001

100th Anniversary  
1901-2001

NO SMOKING  
NO EATING  
NO DRINKING  
NO SHOES  
NO BAGS

Bethlehem  
Area Public Library  
100th Anniversary  
1901-2001

# PURPOSE

Could the proposed pedestrian bridge over the Lehigh River be more than just a crossing from point A to B? This is a question that the consultant team explored with the community and members of the Working Group from the start of the Feasibility Study.

Out of these conversations came the threads of four foundational ideas that were presented back to the community throughout the process to be considered, and refined, and ultimately, adopted as guiding principles for the project.

These four principles capture the aspirations of the community and are intended to guide not just the feasibility study but the design of the bridge going forward.

## GUIDING PRINCIPLES

Based on the community aspirations, it is hoped that the Bethlehem Pedestrian Bridge will become:

- + **A Catalyst for Vitality**
- + **A Cultural Canvas**
- + **Safe, Well-Connected, and Equitable**
- + **Sustainable and Resilient**

*Could the proposed pedestrian bridge over the Lehigh River be more than just a crossing from point A to B? For most in the community, the answer was yes!*

## A CATALYST FOR VITALITY

The City of Bethlehem is a city of festivals that attracts visitors from across the country. Its rich history dates back to the nation's founding and the many "firsts" invented in the community that continue to shape our country's cities. This history offers days of exploration to the curious and forms a stunning backdrop to a lively street life on the north and south sides, where hotels, restaurants, breweries, cafes, and museums spill out onto the sidewalks.

Yet the river divides the two downtowns and in essence makes them compete against each other for daily errands, evenings spent out on the town, cups of coffee that fuel student life, and tourist dollars.

The intent of this principle is to design the bridge as a gateway to all the city has to offer—as a way to pique the interest of visitors and serve as a launching off point for exploration on both sides of the river.

The intent is not to focus only on the visitor, rather it is also intended to guide the bridge design as a zipper that stitches both sides of the city back together, creating an outdoor gathering place for all residents to come together and enjoy the river, the breathtaking views, the history, art and music, and simply being with each other.





## A CATALYST FOR VITALITY

*Form a welcoming gateway that harnesses the city's hotels, restaurants, historic sites, artistic and musical venues, and recreational assets to boost economic vitality citywide.*



IMAGE SOURCES: (L) WWW.BUROHAPPOLD.COM; (R) WWW.BEHANCE.NET



## A CULTURAL CANVAS

*The connection should be a destination that is both iconic and distinctly Bethlehem, reflecting the city’s history and artistic culture, and designed as a canvas to support programs and events from one side to the other.*

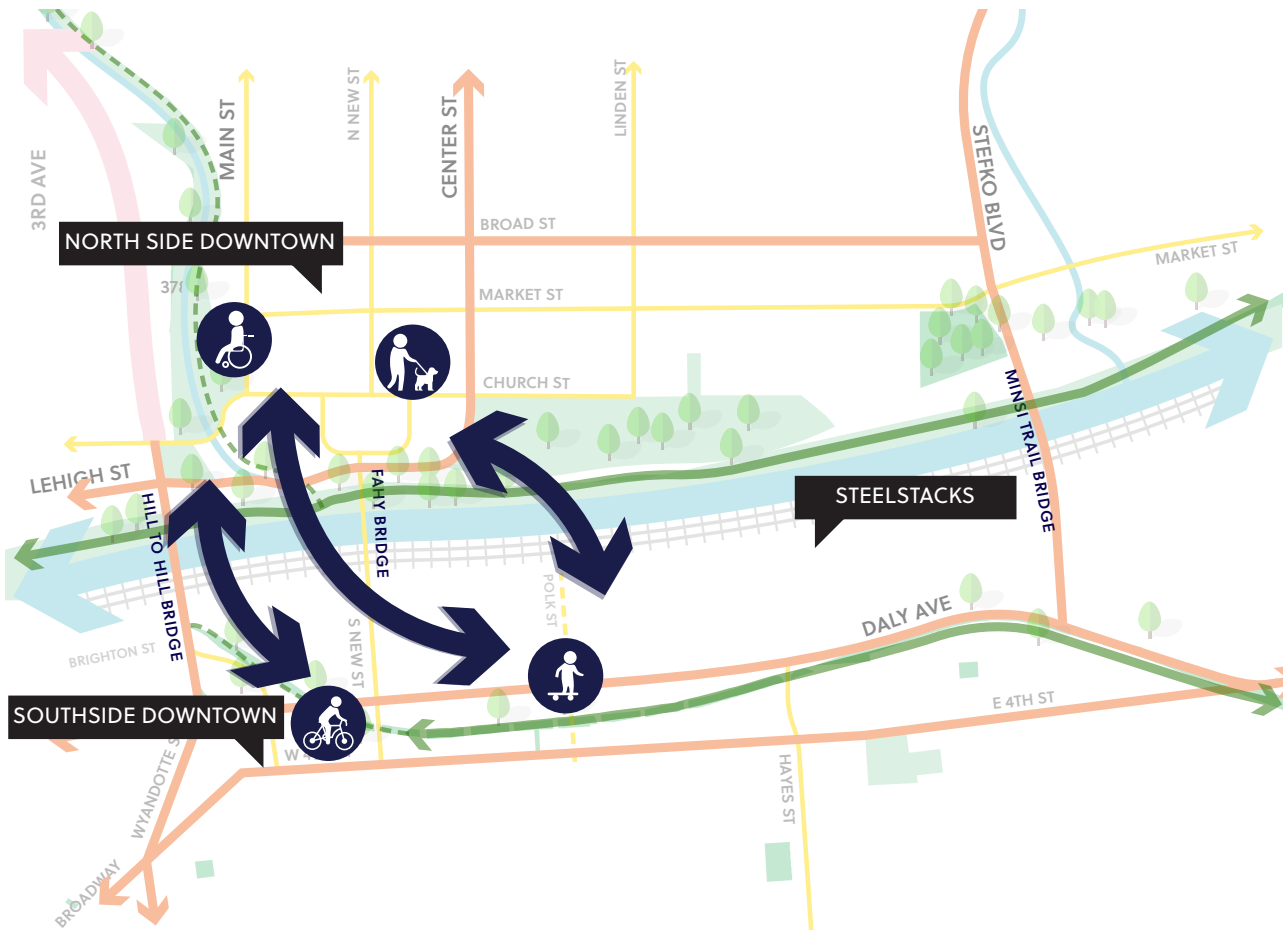
## A CULTURAL CANVAS

History is not the only thing on display in Bethlehem. The arts, music, and performance are an integral part of the city’s fabric from the vibrant art scene blossoming in the SouthSide Arts District to Musikfest set amid the stunning industrial relic of SteelStacks.

In designing the pedestrian bridge, it is hoped that it too can become a canvas that is activated by performances, art shows, interpretive signage, green spaces, and projections.

The bridge design should allow for the festivals to spill over onto the bridge and connect the north and south sides. And the form of the bridge itself should be designed in a way that is “distinctly Bethlehem;” that seemingly springs organically out of the city’s innovative history while looking forward to the future. The materials, bridge profile, wayfinding and signage, and sculptural elements that can be seen from far away are all opportunities to create another iconic element in the city where people want to be.





## SAFE, WELL-CONNECTED & EQUITABLE

*Create a connection across the Lehigh River between the North and South sides that safely accommodates a full range of users (cyclists, scooters, wheelchairs, pedestrians), filling in a vital link in the regional trail network and connecting multiple points of interest in the city.*

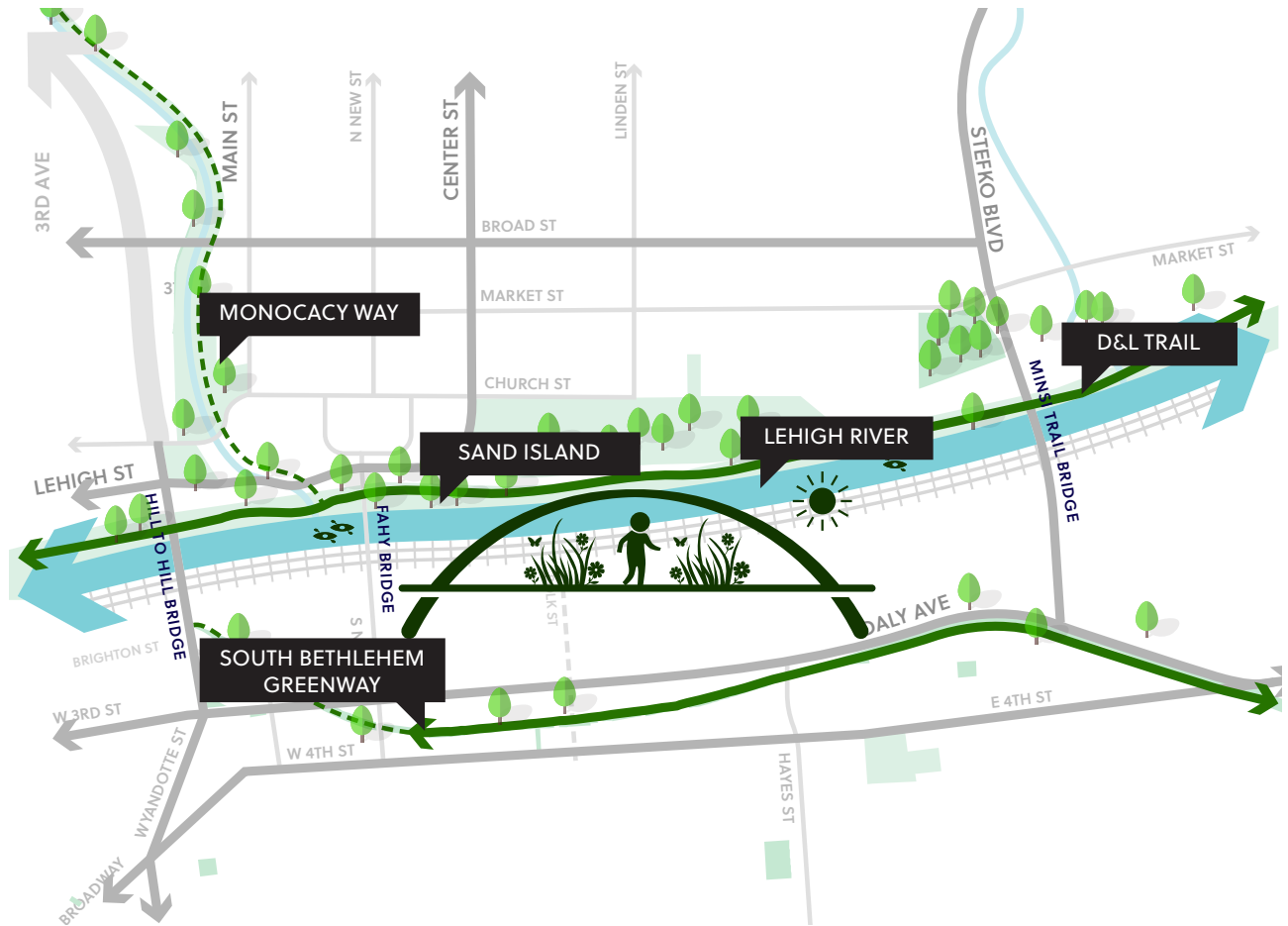
### SAFE, WELL-CONNECTED & EQUITABLE

One of the biggest drivers for a pedestrian bridge in Bethlehem is the gap in the regional trail network between the South Bethlehem Greenway and the Delaware & Lehigh Canal. Filling in this gap has the potential to connect hundreds of miles of trails that would enhance recreational use and increase the potential for commuter use.

Ensuring the connection is designed for the safety of all users is a chief concern. This includes commuter

cyclists, recreational cyclists, runners and walkers, wheelchairs, scooters, and strollers, as well those who are out for a leisurely stroll, night on the town, or daily errand.

Just as important is that the bridge feel inviting to all—regardless of background, income, residency, age, or gender. And the bridge must be designed for personal safety, day and night.



## SUSTAINABLE & RESILIENT

*Demonstrate and inspire a more sustainable lifestyle by fostering a walkable city, integrating renewable sources of materials and energy into the bridge, and strengthening connections between people and nature.*

## SUSTAINABLE & RESILIENT

Bethlehem's recently adopted Climate Action Plan is a testament to the community's commitment to addressing climate change. Constructing a pedestrian bridge offers a tremendous opportunity to demonstrate this commitment in multiple ways. By creating a more walkable and bikeable city, residents will have a way to reduce vehicle miles traveled and carbon emissions. The bridge can become a demonstration of sustainable building practices through the materials used and construction management. Renewable energy

can be explored to light the bridge, rainwater can be harvested to irrigate plantings, and interpretation can be installed to explain these features.

The new crossing can also foster a stronger connection between people and the river ecosystem, instilling a greater appreciation and sense of stewardship by bringing residents of all ages closer to the water along the riverwalk and proposed fishing pier / boat launch.











# CONCEPTUAL ALTERNATIVES



# EARLY CONCEPT DEVELOPMENT

## CONCEPTUAL IDEATION

Once it was determined that the community's preference was to locate the pedestrian bridge to the east of the Fahy Bridge with a connection on the north side near Center Street and on the southside in the area near Webster Street or Polk Street, a series of conceptual alternatives began to take shape.

The initial approach to the concept development was to think first about the simplest, most direct connection. From there, the second and third concepts focused on potential opportunities to more fully address the guiding principles. This included creating spaces for gathering, seating, display and performances; creating a vibrant gateway to the city; and minimizing the environmental impact.

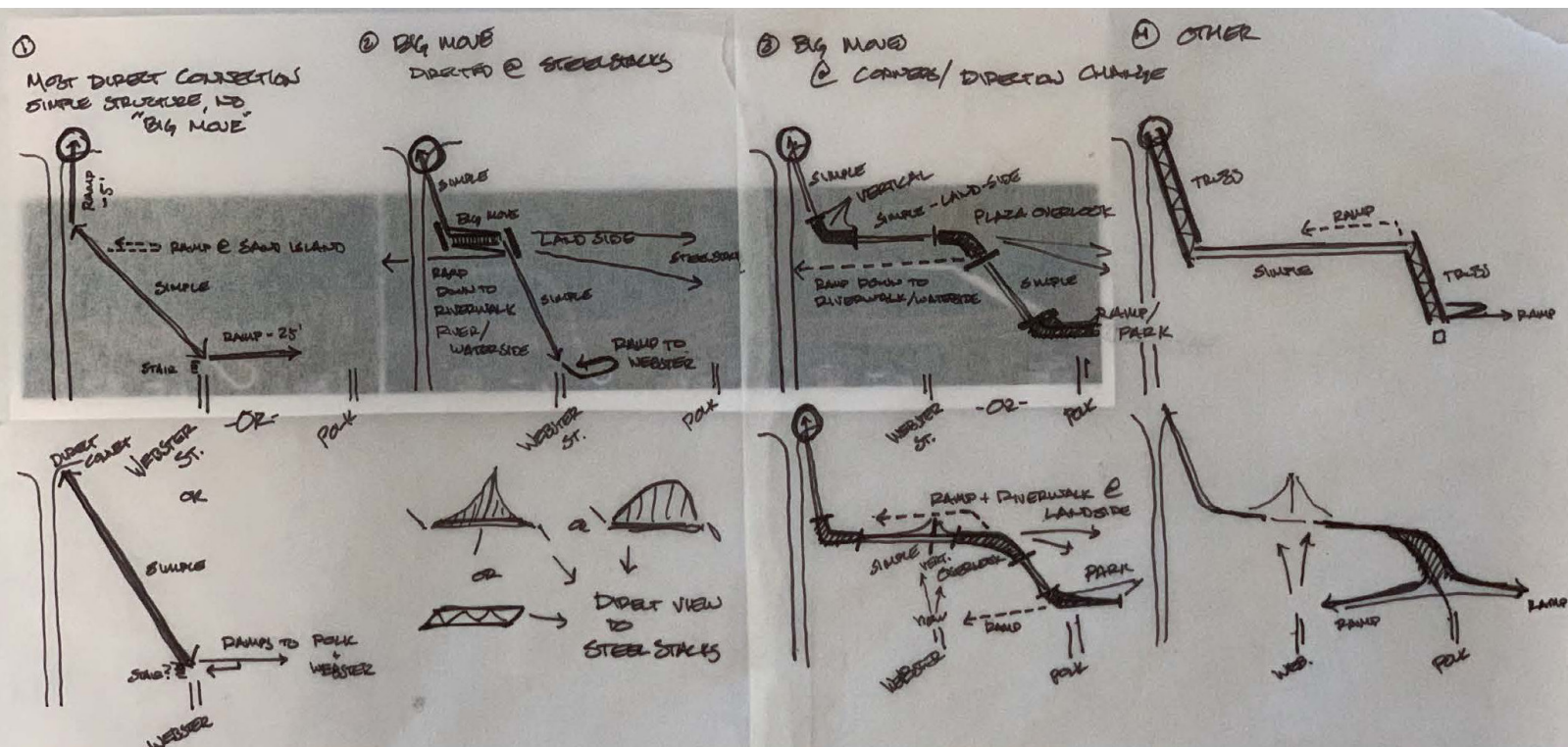
Views of the city's amenities were carefully considered so that the bridge could take advantage of new and captivating vantage points. Exploring the sculptural complexity of the bridge presented an opportunity to create something in and of itself

that would be distinctly Bethlehem. For example, the immense stainless steel sculpture Cloud Gate by Anish Kapoor in Chicago's Millennium Park, affectionately called "the Bean," has become synonymous with the city and a must stop for selfies.

Another consider for the conceptualization of the bridge entailed examining ways to use the bridge structure to form a wayfinding element that would attract visitors to the bridge and serve as a landmark in the city skyline.

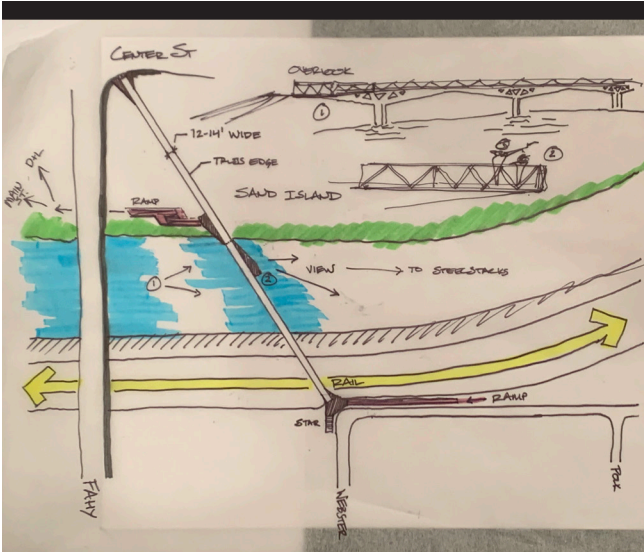
Accessibility was also a chief concern, in particular, finding ways to provide safe, accessible entry points and to limit the need for users to travel up and down and up and down by ramping up and over the railroads, staying at that height before ramping down to the north side.

Early sketches (below) show how the concepts began to evolve from a direct line to a more meandering path.





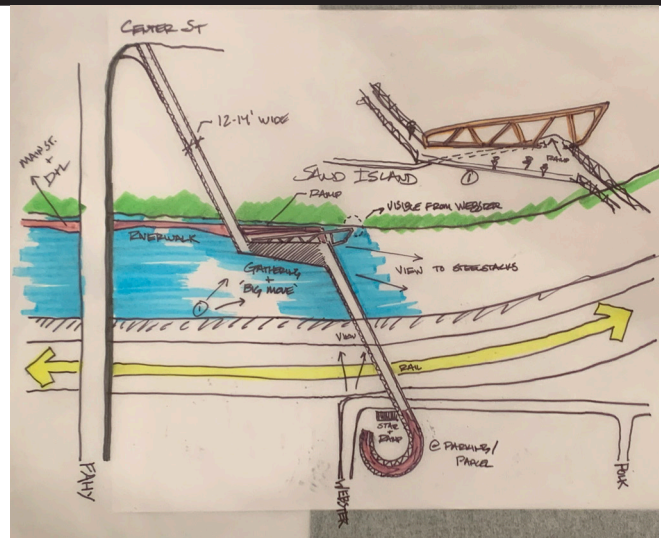
CONCEPTUAL STUDIES



CONCEPT 1: LINE - The most direct connection across the river

The first concept (1) explored a “direct” approach, the simplest route from the north side to the south side with a focus on pedestrian and cyclist connectivity. This option stretched from Center Street and New (Fahy) Street on the north side over the river to Webster Street. This alternative envisioned a ramp down to Sand Island, and a ramp (and a stair) on the southside with an enhanced connection leading toward Polk Street.

- + **Connection Points:** Center Street and New (Fahy) Street on north side to Webster on south side (ramp toward Polk Street, staircase at Webster), and ramp at Sand Island.
- + Most direct/shortest **LINE** connection from north to south side.
- + **Width of Bridge:** 12-14' wide (shared- use path in both directions) with an overlook/gathering space.
- + **Structure + Materials:** pier/ column and beam span, materials to be discussed/determined.

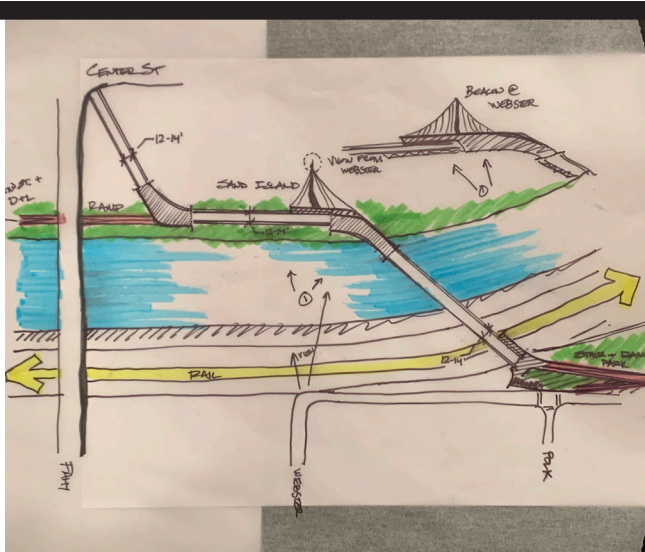


CONCEPT 2: SHIFT = a “big move” or destination on the bridge

The second concept (2) introduced a “shift” in the path of the bridge to create a gathering space and overlook that could connect to a potential riverwalk along Sand Island. Like the first alternative, this option stretched from Center Street on the northside over the river to Webster Street. This alternative envisioned a ramp down to Sand Island, and a ramp (and a stair) on the southside.

- + **Connection Points:** Center Street and New (Fahy) Street on north side to Webster Street on southside (circular/sculptural ramp and staircase at Webster), and ramp at Sand Island.
- + Direct connection from north to south side, with more of a gathering space at the **SHIFT**
- + **Width of Bridge:** 12-14' wide (shared- use path in both directions) with a wider 30-40' overlook/gathering space
- + **Structure + Materials:** truss structure, with a vertical moment, materials to be discussed/determined.

# PEDESTRIAN BRIDGE STRUCTURE



**CONCEPT 3: ROOMS** = a series of gathering spaces along the way

The third concept (3) expanded the length of the bridge from Center Street to Polk Street and introduced a series of “rooms” that could create a variety of spaces for gathering, green elements, performance space, art displays, food vendors, etc. These rooms would also offer different views and experiences for the users.

- + **Connection Points:** Center Street and New (Fahy) Street on north side to Polk Street on southside (ramp park and staircase at Polk), and ramp at Sand Island.
- + Longest connection from north to south side (favors SteelStacks landing)
- + **Width of Bridge:** 12-14' wide (shared-use path in both directions) with overlook/gathering **ROOMS** at corners/turns.
- + **Structure + Materials:** various opportunities for structural elements at rooms, materials to be discussed/determined.

## STUDYING STRUCTURAL ALTERNATIVES

In addition to analyzing the general connection points for the bridge and the nature of the experience for users of the bridge, the consultant team began to explore a variety of structural options for the bridge. The engineering team examined the the clearance and potential location of the piers needed to span the rail tracks, and explored ways the design of the bridge could reinforce the desired experience.

Four primary bridge structures were analyzed, a beam structure, a truss structure, tied arches, and suspension. Each was assessed based on a series of key elements for consideration, and it was determined that the conceptual options would each explore a different structural opportunity for the bridge to elicit additional feedback and to understand the strengths and implications of the structural options.

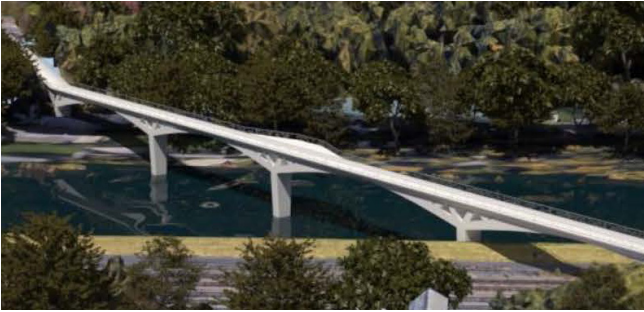
### Key elements for consideration:

- + Understanding the cost of the structural options
- + Ensuring the vertical structure does not block views from the bridge
- + What structural/material options make the bridge most “uniquely/distinctly” Bethlehem?
- + How can the structure reinforce the experience?



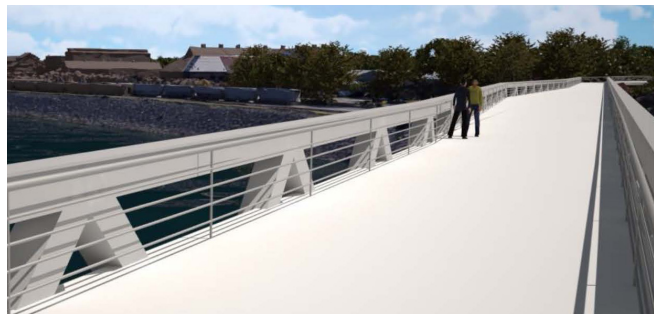
## BEAM

- » Structural system below the walking/biking surface



## TRUSS

- » Structural system becomes part of guardrail system



## TIED ARCH

- » Structural system below the walking/biking surface



## SUSPENSION

- » Structural system becomes part of guardrail system



# DESIGN ALTERNATES

## REFINING THE CONCEPTUAL ALTERNATIVES

The concepts continued to evolve as the feasibility of the bridge alternatives was explored further and as the alternatives integrated feedback gathered from the Working Group and the community.

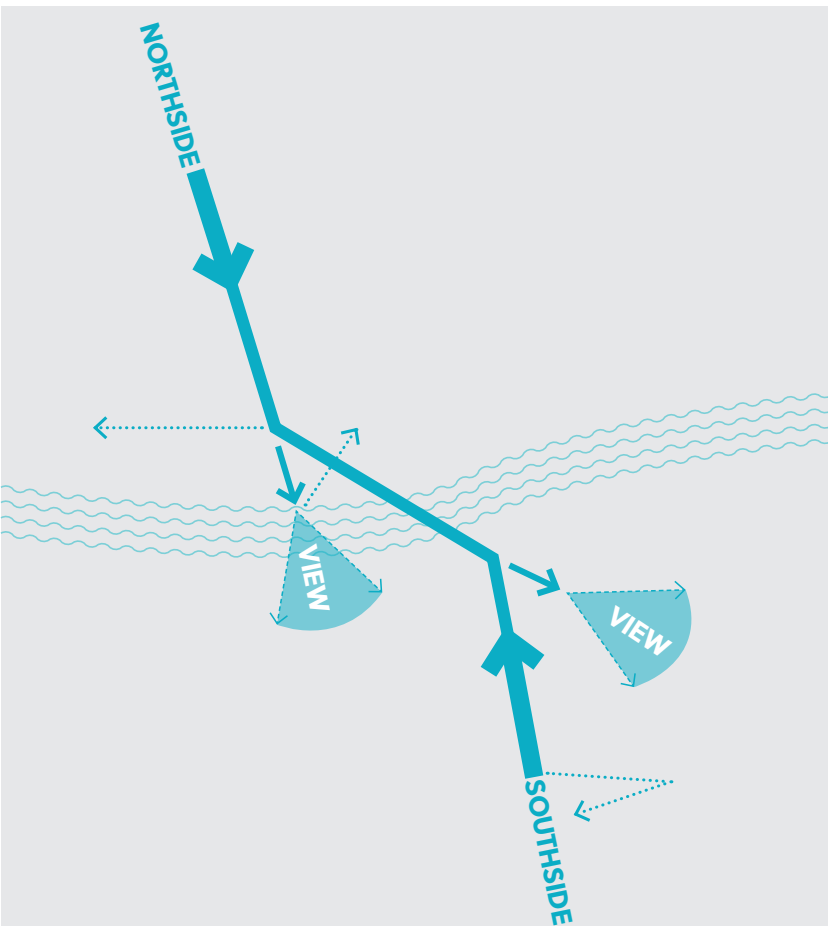
Because of the location of the tennis courts and historic pavilion on Sand Island, the location of the piers on the north side shifted slightly. This is most evident in Alternative 1, which was originally conceived as a straight line. Another factor for all of the alternatives was the need to span the rail tracks on the southside at an angle perpendicular to the tracks. All three alternatives integrate a riverwalk, which was favored by the community.

These diagrams offer simple illustrations of the final bridge alternatives proposed by this Feasibility Study.

**Alternative 1: Extend** is the simplest design and least expensive option, which provides the most direct connection from Center Street on the north side to Webster Street on the southside. The 16' width allows for a shared-use path for pedestrians and cyclists. Small viewing platforms are located at the river's edge on the north side, with another over the river to capture views of SteelStacks, and then atop a ramp down to Webster Street.

**Alternative 2: Shift** builds on the first alternative with a wider profile of 25' to allow for more comfortable bike lanes. It also creates a more substantial gathering space over the water framing views of the tree canopy on Sand Island and SteelStacks to the south. This alternative also proposes rerouting 1<sup>st</sup> Street to create a green space surrounding the ramp on the south side.

**Alternative 3: Rooms** connects Center Street over to Polk Street on the southside and integrates a much larger gathering space (approximately 60' in width) over the water, taking in views of the tree canopy over Sand Island and the views of SteelStacks. It also features a wider profile similar to Alternative 2 of 25' to accommodate dedicated lanes of travel. On the southside, the ramp down to Polk Street creates a natural seating area with views of SteelStacks, where visitors could enjoy the many performances.

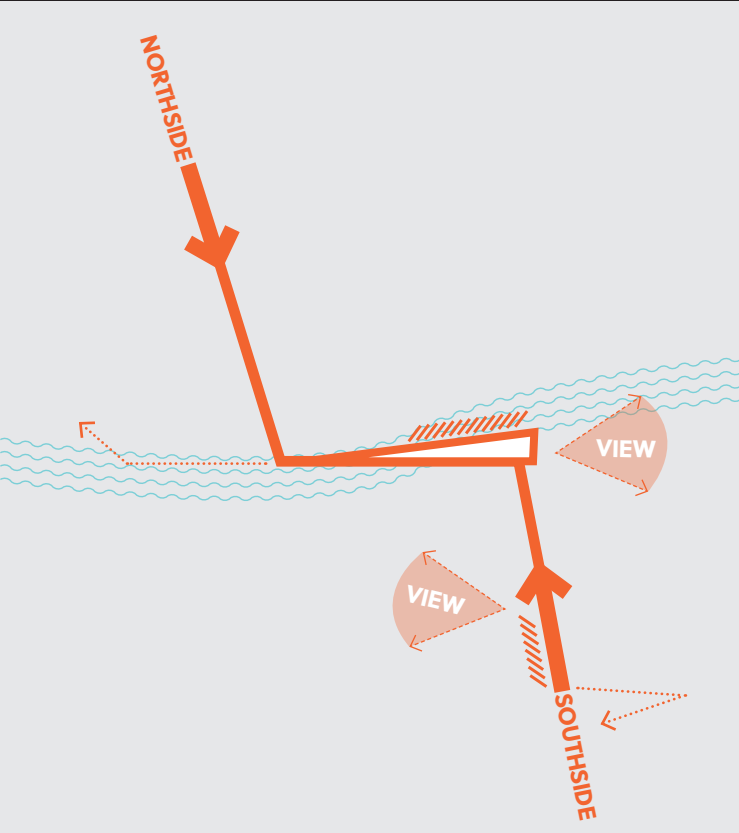


## ALTERNATIVE

### 1: EXTEND

- + Connection: New/Center (north) to Webster (south)
- + Length ~1350' (1/4mi.) Typ. (N-S not including ramp)
- + Cost Estimate: \$35-40m



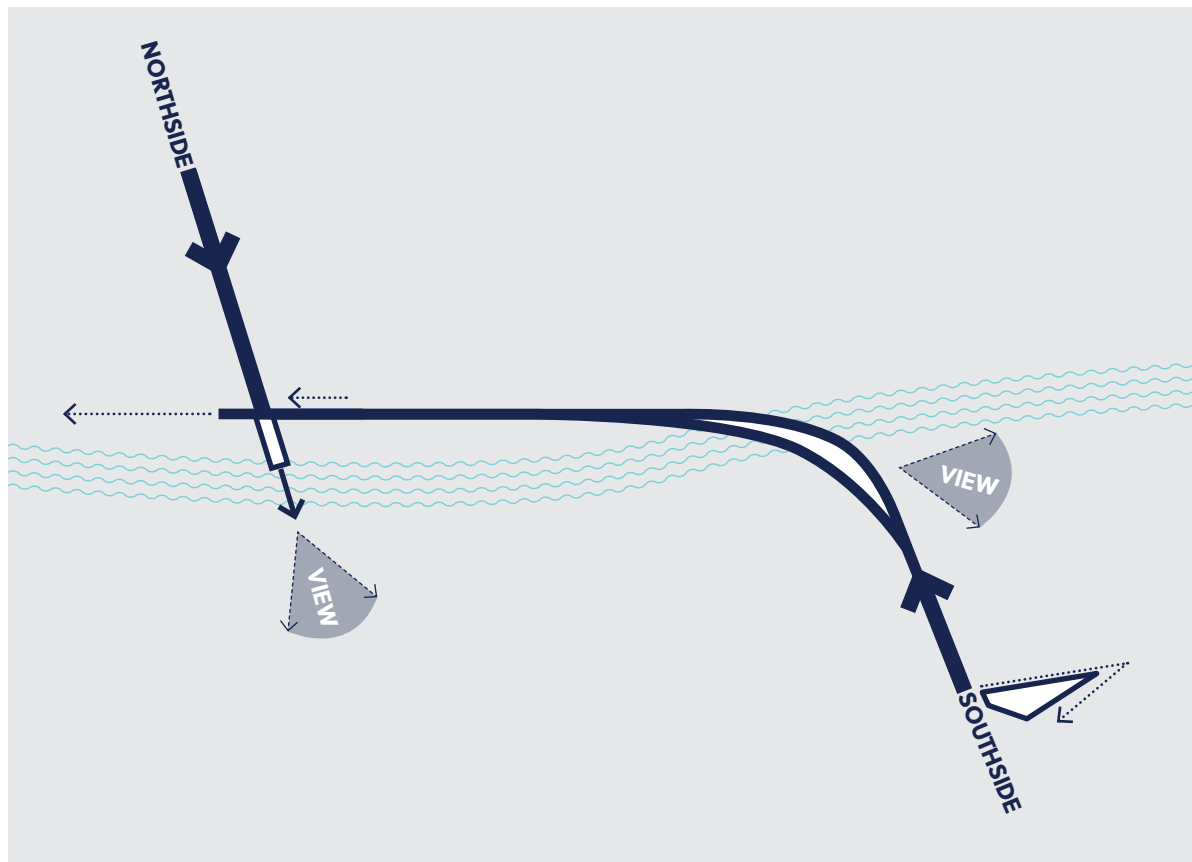


**ALTERNATIVE  
2: SHIFT**

- + Connection: New/Center (north) to Webster (south)
- + Length ~1350' (1/4mi.) Typ. (*N-S not including ramp*)
- + Cost Estimate: \$46-50m

**ALTERNATIVE  
3: ROOMS**

- + Connection: New/Center (north) to Polk (south)
- + Length ~1800' (1/3mi.) Typ. (*N-S not including ramp*)
- + Cost Estimate: \$83-85m



# FINAL BRIDGE CONCEPTS

## ALTERNATIVE 1: EXTEND

In the diagram to the right, traveling from north to south, Alternative 1 features a small plaza at Center Street/Fahy Bridge to mark the entrance to the bridge.

The first segment of the bridge runs to the river's edge where users can either take a stair or ramp down to Sand Island, or continue across the river. On Sand Island the stair and ramp connect to a proposed riverwalk along the banks that connects to a proposed fishing pier and kayak launch, children's garden and a proposed civic plaza that could serve as a trailhead to the D&L Canal.

This alternative extends over the river and offers a scenic overlook towards SteelStacks just before crossing the rail tracks on the south side. The final segment of the bridge ramps down to Webster Street and also includes a set of stairs that connects users to the southside.

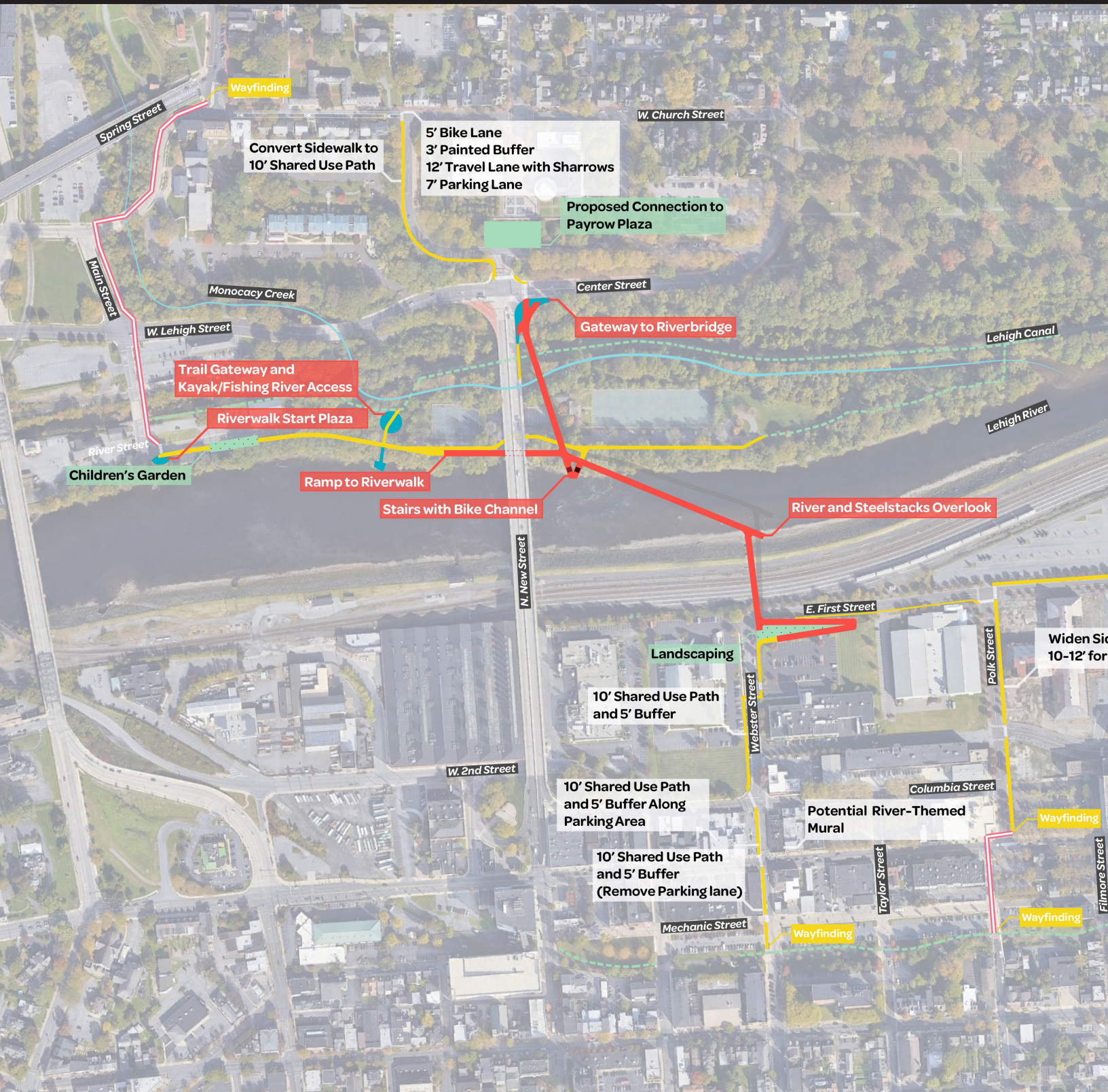
*The images below illustrate conceptual 3D model views of how this concept could take shape and the views it would afford.*











**FIGURE 18. RECOMMENDED STREETScape ENHANCEMENTS FOR ALTERNATIVE 1**



## RECOMMENDED STREET CONNECTIONS AND IMPROVEMENTS

While the focus of this study was to explore the feasibility of a bridge connection between the north and south sides, it is also important to look beyond the “ends” of the bridge to explore the feasibility of connecting to the center of the downtowns on both the north and south sides and to integrate signage and wayfinding to guide residents and visitors to the bridge.

### ALTERNATIVE 1

The diagram to the left illustrates a series of recommendations for streetscape improvements to connect Bridge Alternative 1 to historic Main Street on the north side, and to Third Street, the South Bethlehem Greenway, and SteelStacks on the southside. As the project moves forward, further analysis and detailed design of the improvements will be required. These improvements could be phased and incorporated into the City’s annual Capital Improvement Projects.

#### On the North Side:

On the north side, the most direct route to the proposed pedestrian bridge from the historic district would be from Main Street to W. Church Street to N. New Street to Center Street.

#### *Proposed Pedestrian Accommodations:*

There are continuous sidewalks along this entire path. The route length is approximately 1600’ (0.3 miles), which is only a 6-minute walk for the average adult. It is recommended that

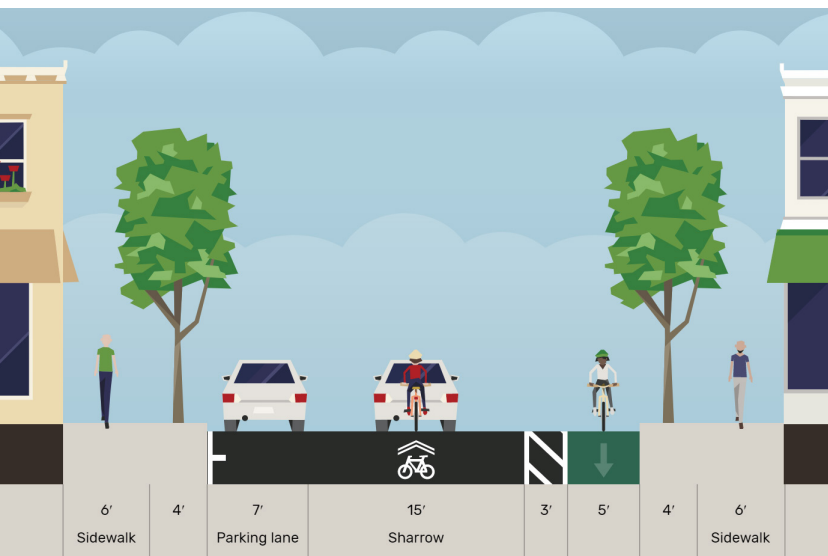
- + the entire route be upgraded with ADA accessible sidewalks and curb ramps.
- + pedestrian-scale lighting be installed along Church Street from Main Street to New Street.
- + ornamental light poles be considered with fixtures matching Main Street.
- + colorized/textured crosswalks be considered at the intersections of Main Street/Church Street and New Street/Church Street to enhance safety and visibility.
- + signage and wayfinding also be installed or updated to include directions to the proposed pedestrian bridge.



**Proposed Bicycle Accommodations:**

The existing Church Street is a one-way 30'-wide street. It is recommended that it be reconfigured to allow a 7' parking lane, 15' travel lane with bicycle shared lane markings, one 5' bike lane in the eastbound direction with a 3' painted buffer between the travel lane and bike lane. Shared lane markings are often called "sharrows" and advise motorists to be aware of the higher frequency of bicyclists on the roadway. The markings also communicate to bicyclists that this roadway is a preferred bicycle route. Westbound bicyclists will share the motor vehicle lane and eastbound bicyclists will use a contraflow bike lane separated by a double yellow line and the 3' painted buffer.

It is recommended that the existing sidewalk on New Street be converted to a 10' shared-use path for walking and cycling. A 5' grass buffer or parking protected area could be maintained along the proposed shared use path. Bicyclists would then use the existing continental crosswalks and pedestrian push buttons to travel to the southeast corner of the Center Street/New Street intersection to connect to the proposed plaza/gateway at Center Street/Fahy Bridge to enter the proposed new pedestrian bridge.



**FIGURE 19. PROPOSED STREET MODIFICATIONS ON CHURCH STREET**

**On the Southside:**

As pedestrians, cyclists, and other users descend from the proposed new bridge on the south side, they will arrive at Webster Street. For those heading toward 3rd Street, the SouthSide Arts District, or the South Bethlehem Greenway, they would likely travel along Webster Street.

Recommended improvements along Webster Street include:

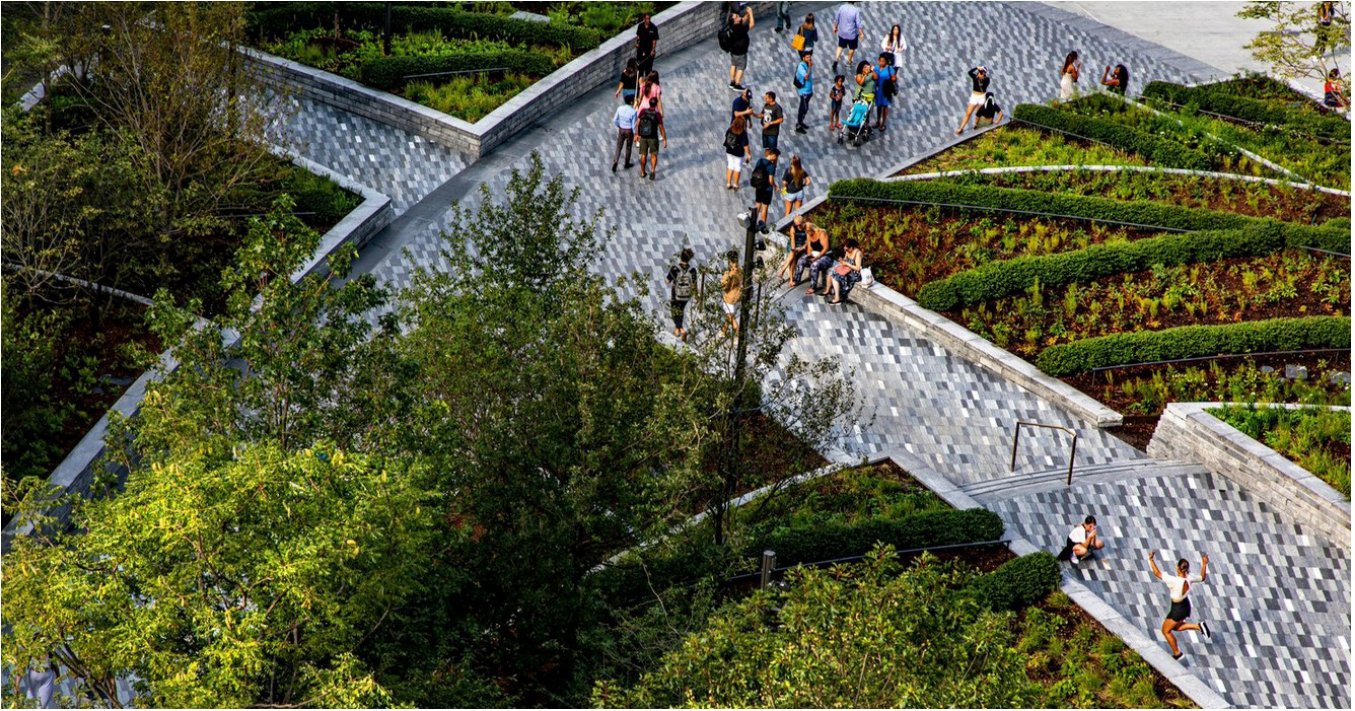
- + 10' shared-use path with a 5' buffer for pedestrians and cyclists
- + An enhanced crosswalk by OraSure Technologies to improve safety and visibility
- + Signage and wayfinding to direct users to the proposed new bridge
- + Potential mural between Columbia Street and E. 3rd Street on the existing building

To enhance the connection to Lehigh University, the South Bethlehem Greenway, and points further east, it is anticipated many users would travel down Polk Street.

Recommended improvements along Polk Street include:

- + Widening the existing 8' sidewalk to create a 10-12' shared-use path from E. 1st Street to E. 3rd Street
- + Enhancing the existing infrastructure from E. 3rd Street to the South Bethlehem Greenway to "Share the Road"
- + Signage and wayfinding at key locations such as the South Bethlehem Greenway and E. 3rd Street
- + For those going to SteelStacks, it is anticipated they would likely travel along E. 1st Street.
- + Recommended improvements along E. 1st Street include:
  - + At-grade walkway/trail connection to the from Webster Street to SteelStacks
  - + Signage and wayfinding





**THE PUBLIC SQUARE AND GARDENS AT HUDSON YARDS / NELSON BYRD WOLTZ LANDSCAPE ARCHITECTS**

SOURCE: [HTTPS://WWW.ARCHDAILY.COM/930101/THE-PUBLIC-SQUARE-AND-GARDENS-AT-HUDSON-YARDS-NELSON-BYRD-WOLTZ-LANDSCAPE-ARCHITECTS](https://www.archdaily.com/930101/the-public-square-and-gardens-at-hudson-yards-nelson-byrd-woltz-landscape-architects)

## ADDITIONAL RECOMMENDATIONS

### MAIN STREET

Main Street and the historic corridor form a major attraction in the city. Because of its significance, popularity as a destination, and the number of events held in this area, it is also recommended that enhancements be made to Main Street from W. Church Street to River Street at the start of the proposed riverwalk.

At a minimum, it is recommended that shared-lane markings be integrated (i.e., sharrows) to improve safety for cyclists. Improved and/or widened sidewalks, pedestrian-scale lighting, decorative crosswalks, signage and wayfinding, and perhaps public art and landscaping are other among the other features to consider celebrating the importance of this corridor; to enhance the comfort and safety of all users; and to draw attention to the new citywide amenity that is the pedestrian crossing.

### CATALYST SITE OPPORTUNITY: PAYROW PLAZA

City Hall, the Public Library, and Payrow Plaza form a beautiful civic space with stunning views of the city. But the same slope that supports those views also creates a barrier between Payrow Plaza and the activity that takes place closer to the river's edge and further separates the north side from the threads that extend over the river to the southside.

The steep slope rising above Center Street to Payrow Plaza presents a tremendous placemaking opportunity for the city that could remove this barrier and shape a more welcoming and visible gateway and entrance to the north side and the city's municipal center.

This important catalyst site warrants a separate design process to explore the full range of possibilities. It is recommended that the design integrate green space, seating, and fully accessible provisions for pedestrians, cyclists, and users with a range of abilities. It should also be designed to compliment the proposed civic space on the south side of Center Street to the east of Fahy Bridge that will be a gateway to the new pedestrian bridge.



## ALTERNATIVE 2: SHIFT

Looking at the diagram (at right) and traveling from north to south, Alternative 2 features a larger landing at Center Street/Fahy Bridge to create a gateway to the north side and to the proposed bridge.

This alternative is wider (25') than Alt. 1 to allow for separated pedestrian and bike lanes. A ramp extends from the bridge down over the river, connecting to the proposed riverwalk. The ramp provides similar connections as Alt. 1 to a proposed fishing pier and kayak launch, the children's garden, and proposed new plaza area to serve as a trailhead to the D&L Trail.

This alternative integrates large sculptural elements that will attract attention from several blocks away, serving as a wayfinding element to attract visitors to the bridge. The sculptural elements will be designed to reflect the city's history and culture in a way that is "distinctly Bethlehem."

This alternative incorporates a much larger central gathering space than Alt. 1 to integrate garden elements, seating, performance and vendor space, scenic overlooks, and interpretive signage.

On the southside, the bridge ramps down at Webster Street and 1<sup>st</sup> Street, which is slightly re-aligned to create a small park space surrounding the ramp at the terminus of Webster Street.

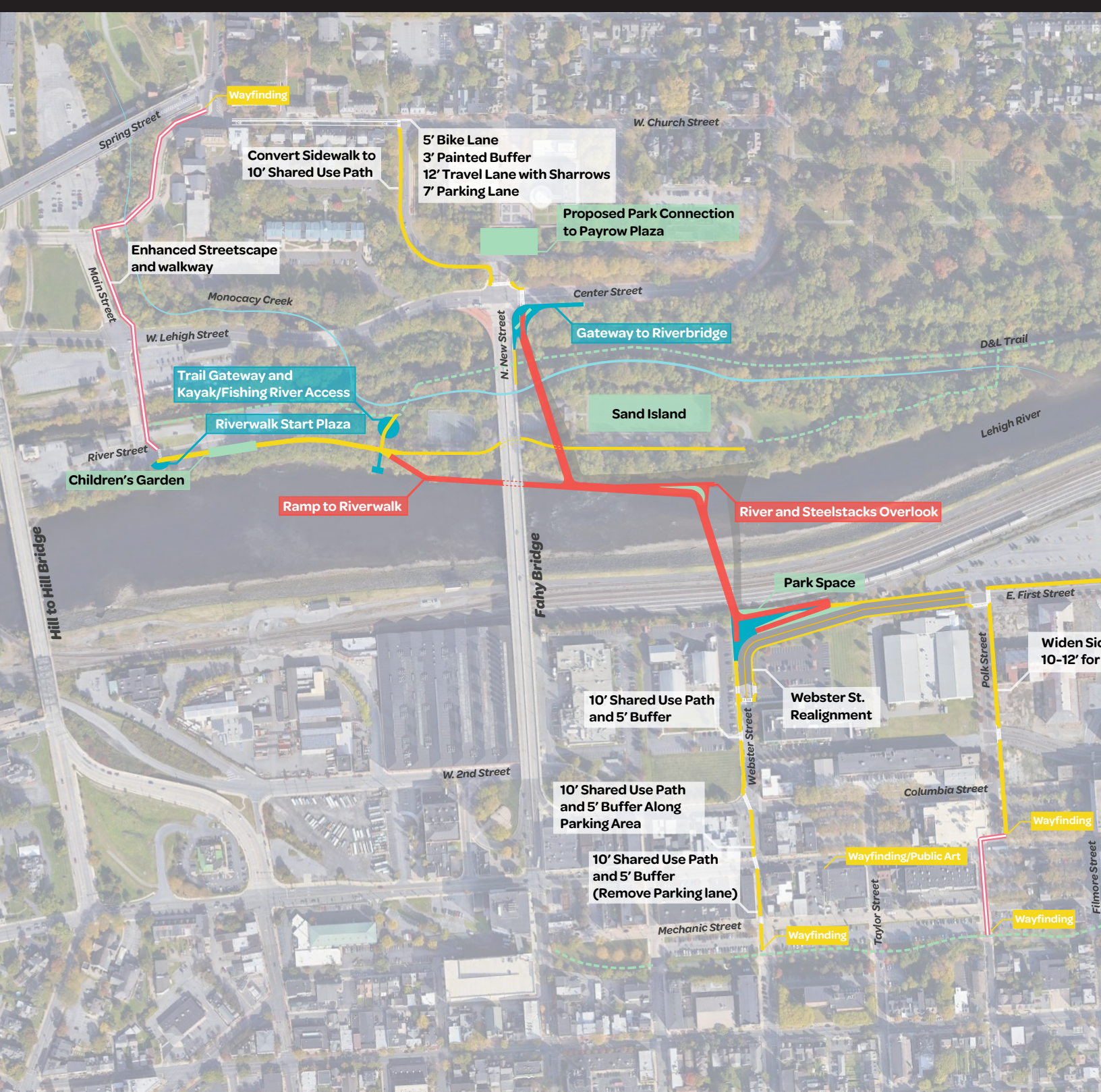
*The images below illustrate conceptual 3D model views of how this concept could take shape and the views it would afford.*











**FIGURE 21. RECOMMEND STREETScape ENHANCEMENTS FOR ALTERNATIVE 2**



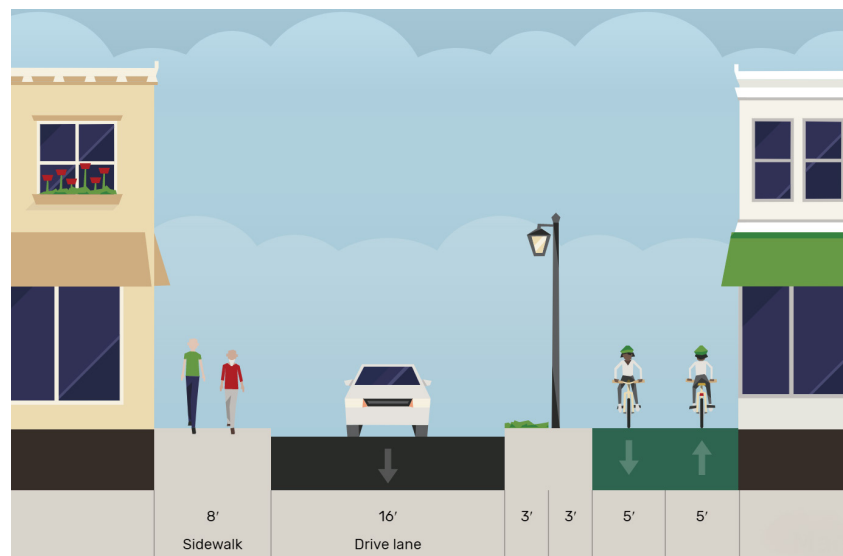
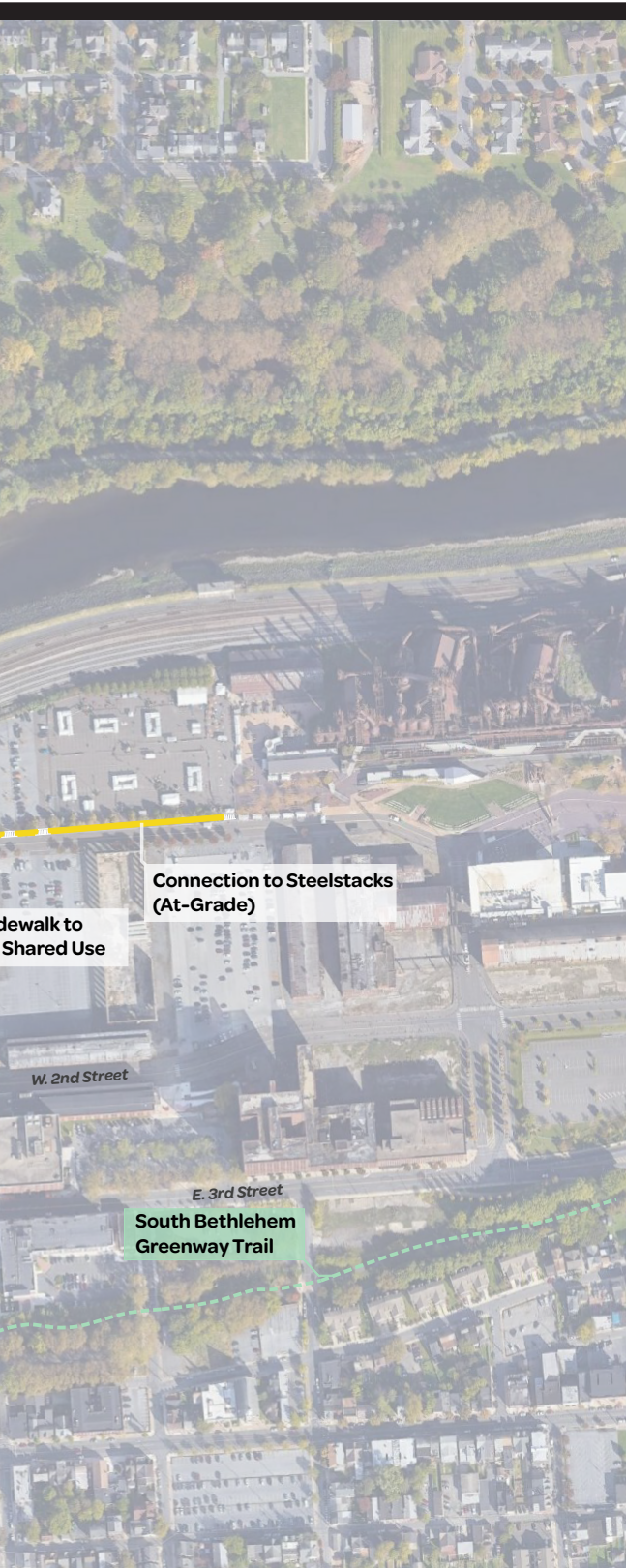
## STREET CONNECTIONS & IMPROVEMENTS

### North Side Recommendations:

The proposed streetscape enhancements for Alternative 2 are the same as those for Alternative 1 with the main goal of getting pedestrians, cyclists, and other bridge users safely from the downtown on the north side to the gateway to the proposed pedestrian bridge at Center Street/Fahy Bridge. And similar to Alternative 1, it is recommended that a series of enhancements be explored for Main Street to connect the historic corridor to the new riverwalk and subsequently the new bridge.

### Southside Recommendations:

For the most part, the streetscape enhancements for Alternative 2 are the same as those for Alternative 1 with one slight exception. Alternative 2 proposes a realignment of E. 1<sup>st</sup> Street to create a park area at the terminus of Webster Street to attract folks toward the bridge. Realigning E. 1<sup>st</sup> Street would also allow for a 10' shared-use path to run along Webster Street from the S. Bethlehem Greenway to E. 1<sup>st</sup> Street on the same side of the street so that pedestrians and cyclists could go directly onto the bridge ramp without having to cross Webster Street in front of the OraSure Technologies building. This would also enable those entering the new bridge ramp coming from the direction of SteelStacks on E. 1<sup>st</sup> Street to remain on the north side of 1<sup>st</sup> Street from SteelStacks all the way to the new bridge ramp.



**FIGURE 22. PROPOSED STREET MODIFICATIONS ON WEBSTER STREET**



## ALTERNATIVE 3: ROOMS

This alternative features a civic plaza at Center Street/Fahy Bridge, similar to Alt. 2, that can serve as a gateway to the north side and to the bridge experience.

Looking at the diagram (at right) and traveling from north to south, the first portion of the bridge terminates with a dramatic overlook extending over the water. Similar to Alt. 1, a ramp extends over and down to Sand Island where it connects to the proposed riverwalk and amenities such as the proposed fishing pier / kayak launch, and proposed plaza/new trailhead to the D&L Canal.

East of the Fahy Bridge, this alternative extends over the banks of Sand Island to create an experience among the tree canopy. A stair extends down to Sand Island near the existing tennis courts.

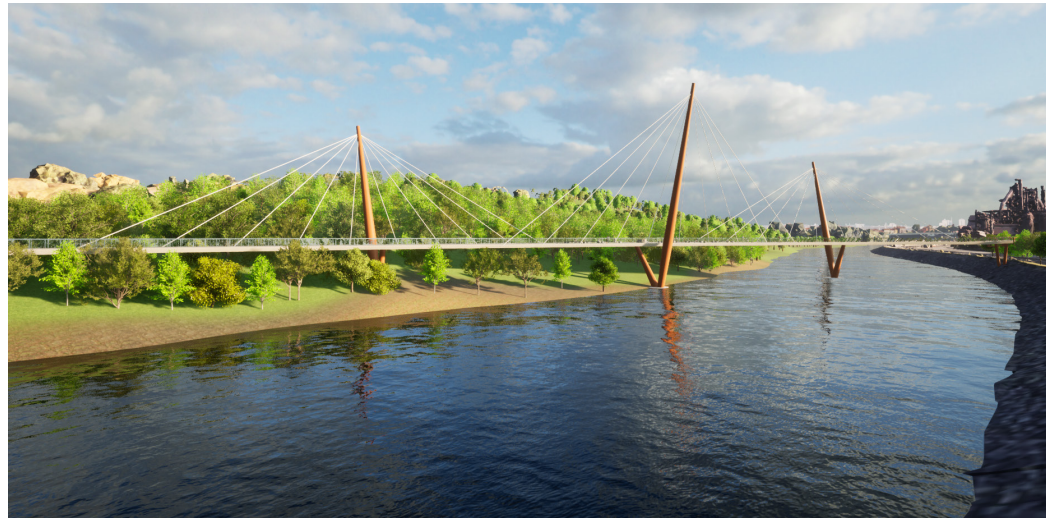
This alternative is also similar in width to Alt. 2 to accommodate separated pedestrian and bike lanes with an even more substantial gathering space than Alt. 2, that stretches over the river. In addition to sweeping views of the city, this area would provide more room for special events (i.e., art festival, farm market, performances), and additional seating.

This alternative culminates in a large park-like amphitheatre space at the end of Polk Street, encircling the ramp while providing a natural seating area overlooking SteelStacks.

*The images below illustrate conceptual 3D model views of how this concept could take shape and the views it would afford.*









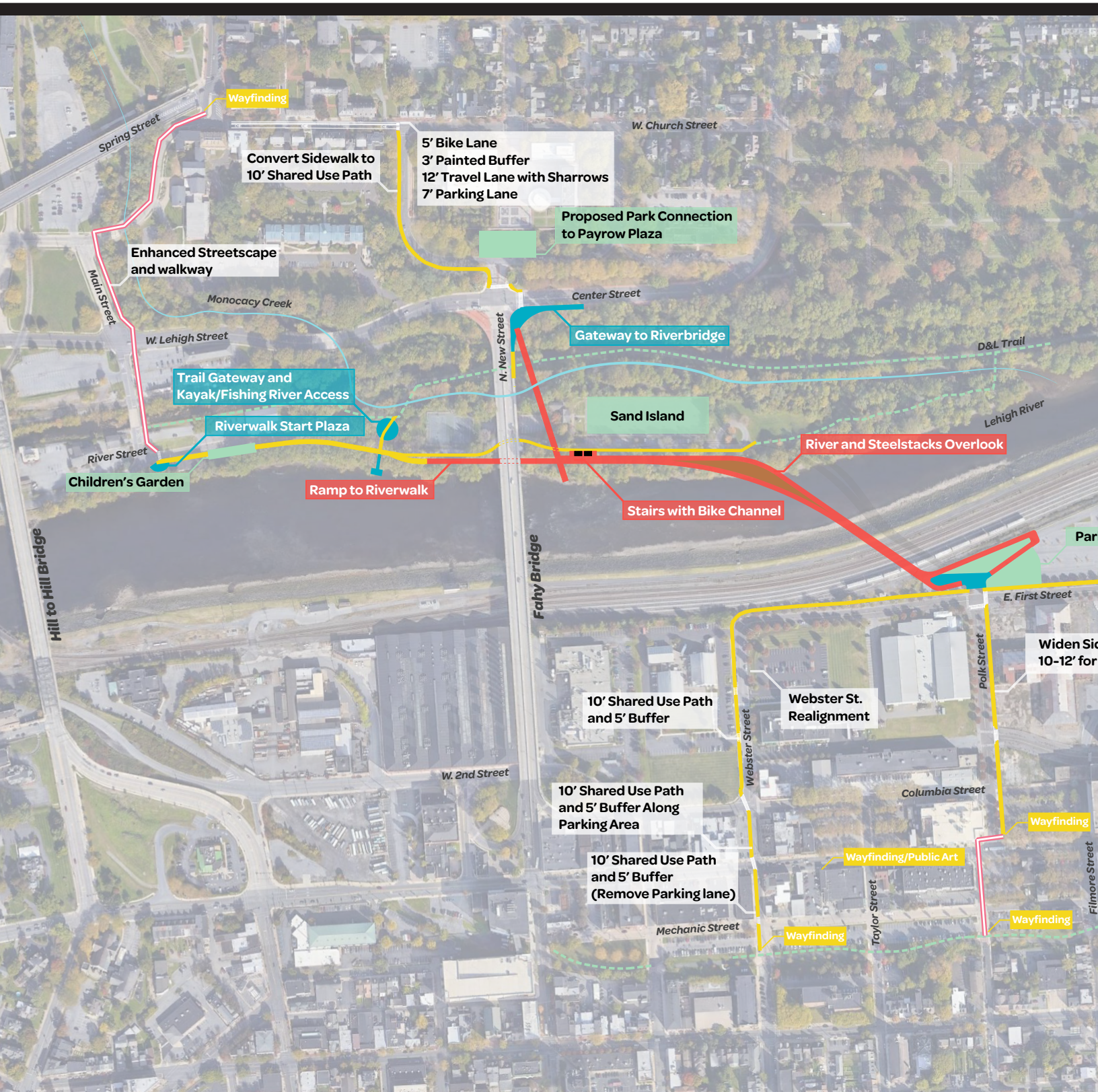


FIGURE 23. RECOMMEND STREETScape ENHANCEMENTS FOR ALTERNATIVE 3



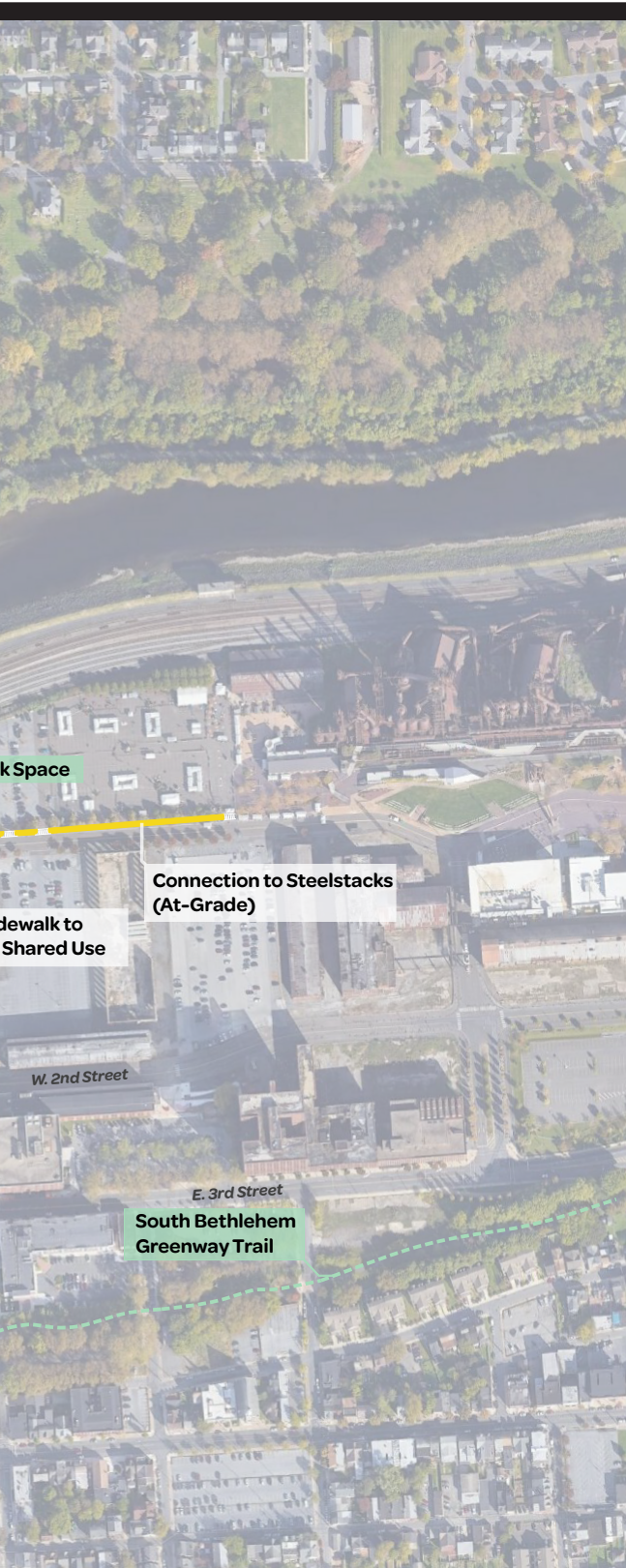
## STREET CONNECTIONS & IMPROVEMENTS

### North Side Recommendations:

Once again, the recommended improvements on the north side are the same as in Alternative 1.

### Southside Recommendations:

In Alternative 3, the proposed pedestrian bridge touches down on the southside at Polk Street. In general, the streetscape recommendations for this alternative are very similar to those illustrated in Alternatives 1 and 2. Alternative 3 proposes a much larger green space at the end of Polk Street, with a switchback ramp descending to E. 1<sup>st</sup> Street.



# ASSESSING THE ALTERNATIVES

On April 20, 2022, the consultant team hosted a final community-wide meeting to summarize the work to date and gather feedback on the three refined bridge alternatives. Due to safety precautions related to the COVID-19 pandemic, the event took place virtually on Zoom. A total of 52 participants took part in the meeting. A recording of the meeting was posted to the project website.

The facilitators walked the audience through the process but focused on the three alternative

concepts, order of magnitude costs, and an analysis of potential economic benefits. The audience was asked to share their preferences on multiple features and the bridge alternatives using live polling, which enabled participants to see responses in real-time. For those wishing to review the options in greater detail and for those unable to attend the meeting, a survey was shared and posted to the project website from April 20 to May 1. A total of 44 people responded to the survey, highlights of which are summarized on the following pages.

## ALIGNMENT

Which alternative best reflects the 4 guiding principles?



Alternative 1

15



Alternative 2

39



Alternative 3

12



All of them

7

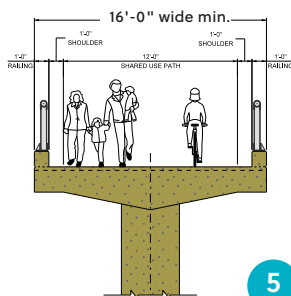


None of them

1

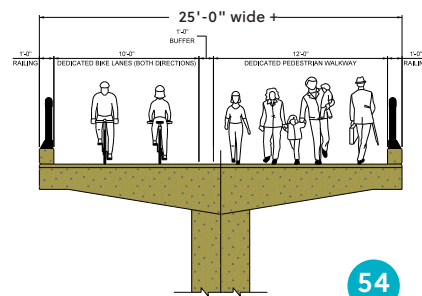
## MOBILITY

What kind of lanes should the preferred alternative have?



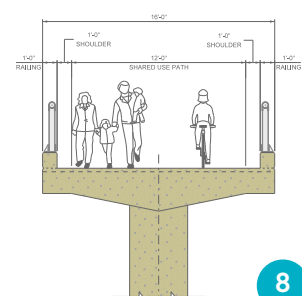
5

Shared-use both directions



54

Dedicated cycle/pedestrian lanes



8

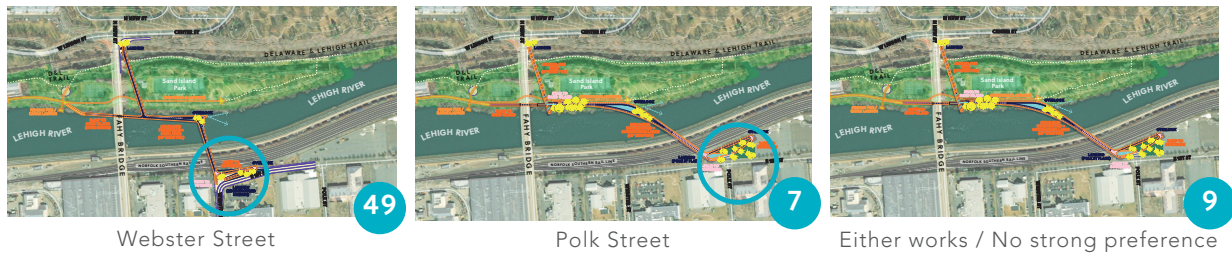
Either works / No strong preference



KEY FINDINGS:

- + Alternative 2 ranked the highest for both overall preference, and for reflecting the guiding principles best.
- + A landing at Webster Street on the southside, and a waterside riverwalk on the north are preferred.
- + Respondents preferred a 25'-wide lane, split between dedicated cycle and pedestrian uses, rather than a shared use option.
- + Beyond connectivity across the river, some believe pedestrian/cycle infrastructure and safety on both ends of the bridge are also critical to consider.
- + A few questions were raised about who this bridge is being created for — Alternative 3, in particular, was perceived by some as catering to tourists over existing residents.
- + There are concerns about the project’s potential impact on property values and housing affordability. People expressed a need to couple this effort with efforts to increase the availability of affordable housing and mitigate displacement.
- + Some participants expressed concern that the community was not engaged enough in the process although it was noted that if the project moves forward, it will require a full design process that would include many more public engagement activities.

CONNECTIVITY



Where should the riverwalk be incorporated?



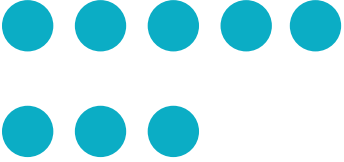
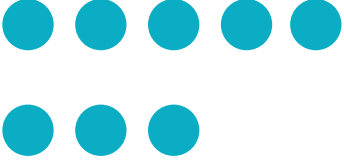


PREFERRED ALTERNATIVE

What is your preferred scheme?



FIGURE 24. VIRTUAL COMMUNITY MEETING SURVEY RESULTS

# WHAT ARE WE MISSING? SHARE YOUR COMMENTS, QUE

THEME	FREQUENCY	
<p><b>CONNECTION</b></p>		<p>"...if we are not thinking clearly about what is happening at either end we will be missing a massive opportunity to truly connect our city."</p>
<p><b>GENTRIFICATION</b></p>		<p>"People who have made a life here are being forced out as-is, and my hope is that this bridge wouldn't contribute to that dynamic."</p>
<p><b>DESIGN</b></p>		<p>"Option 2 is the best design for Bethlehem ... if option 1 could have the appearance of option 2, I would also be on board for that."</p>
<p><b>USES</b></p>		<p>"seating, perhaps on the look out points, would be nice."</p> <p>"Some seating options...would increase accessibility "</p> <p>Alternative 1 &amp; 2</p>



# STIONS, AND FEEDBACK FOR OUR CONSIDERATION...

## COMMENTS

"... connecting to Payrow Plaza is important... an elevated walkway should be considered... At street level this area is not walkable or safe to cross..."

"Webster is a much more helpful option in order to uplift the southside community..."

Alternative 1

"it's important to land on the South Side in an area that makes exploring the neighborhood commercial district easy"

Alternative 2

"...when new parks and trails and other such amenities are built in communities, property values increase and makes the community less affordable to residents, ultimately displacing the residents that were meant to benefit from the new additions in the first place..."

"...ensure that existing community & families are not pushed out..."

"...necessary to address the need for affordable housing..."

"These 3 proposals are not mutually exclusive..."

"Make sure that the design is flexible to allow for features to be added later"

"...project must be ADA accessible..."

"These bridges are beautiful and thematic and fit to scale..."

Alternative 1 & 2

"... ..16' is more than adequate as a minimum trail width."





"I'd like a designated biking area, but specifically on the first one rather than the 25' section. "

Alternative 1

"I prefer Alternative 1 but with the bridge built wide enough to allow for a dedicated bike lane."

FIGURE 25. SURVEY FINDINGS FROM VIRTUAL COMMUNITY MEETING (APRIL 20, 2022)

# WHAT ARE WE MISSING? SHARE YOUR COMMENTS, QUE

THEME	FREQUENCY	
<p><b>PARTICIPATION</b></p>		<p>"The public would benefit from knowing more about the decision-making process...and where the funding will be coming from."</p>
<p><b>AUDIENCE</b></p>		<p>"...please ensure that it also preserves the people who make up this community and culture"</p>
<p><b>ENVIRONMENT</b></p>		<p>"I love the riverwalk portion and attention to improvements on Sand Island..."</p> <p>Alternative 2</p>
<p><b>ALTERNATIVES</b></p>		<p>"...It [Alt. 3] would clearly just be catering to music fest tourists."</p> <p>"For daily commutes and whatnot, this design [Alt. 3] isn't ideal..."</p>



# STIONS, AND FEEDBACK FOR OUR CONSIDERATION...

## COMMENTS

"I hope Bethlehem can engage in less performative forms of public participation in the future."

"... dislike the online format of the public discussions and the lack of actual discussions with the public..."

"You're missing community input... Many community members don't even know a pedestrian bridge will be built..."

".... it is important that this bridge serve the people of Bethlehem who already live and work here."

"Please don't damage the environment of our river!"

"How are you ensuring the protection of this wetland?"

"I believe there are many recreation, pedestrian and biking projects, as well as other projects that would advance the goals of the CAP, that would positively and directly impact the lives of residents for a fraction of the cost of the bridge."

FIGURE 26. SURVEY FINDINGS FROM VIRTUAL COMMUNITY MEETING (APRIL 20, 2022)

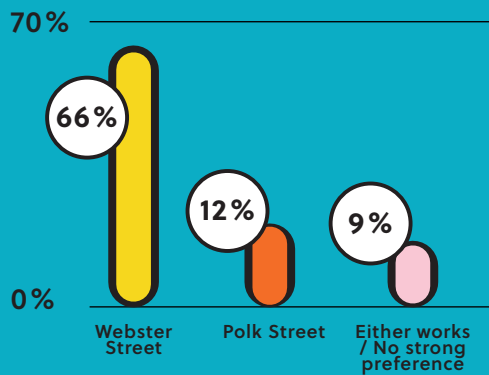
# LISTENING TO THE COMMUNITY

Once the three concept alternatives were refined and their relative feasibility confirmed, they were presented to the Working Group and a few weeks later to the community during a public presentation as described in Section 2. Participants were invited to ask questions and share their thoughts and preferences on individual components of the bridge concepts as well as to identify a preferred alternative. Feedback was very favorable for the project, with the strongest preference for Alternative 2. It should be noted, however, that there were elements of all three of alternatives that the community favored.

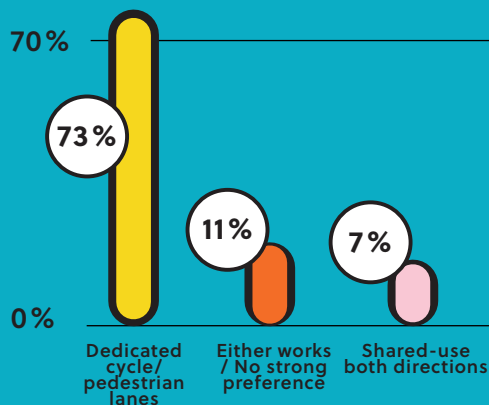
*These 3 proposals are not mutually exclusive. I like #2 for its short stretch perpendicularly over the water. I like #3 for its event spaces at the changes of direction. That performance space should have a vertical element to enable amphitheater-style public seating. The realignment of Wagner St/1st St is good and any terminus at that location will enhance and extend the SteelStacks experience which currently peters out rapidly as one walks west from Artsquest. It will also provide opportunities for commercial and tourist growth towards downtown SouthSide... The trail connectors on Sand Island, to other existing trails, and to Payrow Plaza are definitely positives.*

—Community Member

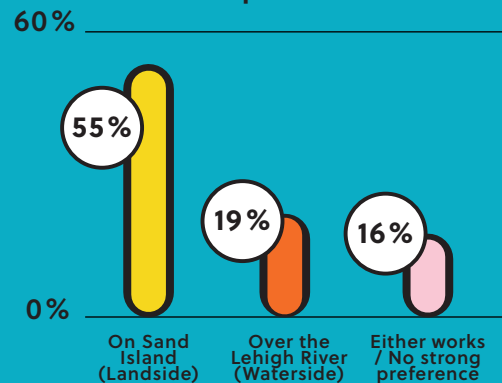
**Which street should the crossing extend to on the southside?**



**What kind of lanes should the preferred alternative have?**



**Where should the riverwalk be incorporated?**

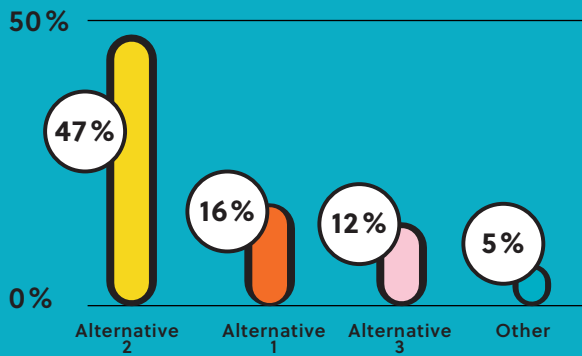




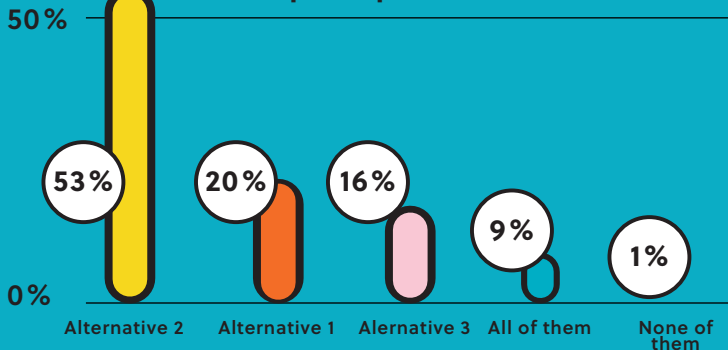
Model view of Alternative 2 with a landing at Webster Street, which was preferred by the community.



### Which is your preferred scheme?



### Which alternative best reflects the 4 guiding principles?



*I think the ramp to Sand Island will definitely be popular for people to stop and spend time, and I like the idea for it to be over the water like a pier/promenade. I think **the Sand Island connector will also be extremely popular as a connector to the D&L Trail and Monocacy Way Trail.** Likewise, Polk/Webster Street connections will be huge to link to Southside B'hem Greenway.*

—Working Group Member

*I love the riverwalk portion and attention to improvements on Sand Island, and I also love the attention to views. I do think it's important to land on the South Side in an area that makes exploring the neighborhood commercial district easy, which Alternative 2 does.*

—Community Member

*The second option, although a bit longer in distance, offers valuable new possibilities as **a centerpiece for a pedestrian hub** between Sand Island and Webster Street. And I think **the ideas for addressing the shoreline are an important compliment to the bridge.***

—Working Group Member

*Webster is a much more helpful option in order to uplift the southside community, which has been largely neglected in Bethlehem's resurgence.*

—Community Member

*Make sure that the design is flexible to allow for features to be added later, not only as further enhancements to the bridge, but making it a destination in itself.*

—Community Member

*From an environmental standpoint, **we have a real opportunity and a responsibility from a sustainability and an environmental standpoint,** to adhere to our city Climate Action Plan, which this bridge is a part of. So design and incorporation of environmental ideas is crucial and necessary in today's world.*

—Working Group Member

*I prefer Alternative 1 but with the bridge built wide enough to allow for a dedicated bike lane. Alternative 3 is just too big and financially inappropriate. I think it completely overwhelms the river and we shouldn't really create a place out on the river where there will be crowds of people attending events. **Please build a bridge that serve residents and pedestrians and cyclists, not one that primarily serves tourists.** We need to connect the two downtowns. I like the designs of Alternate 1 & 2, given the constraint of needing to go over the railroad tracks. These bridges are beautiful and thematic and fit to scale.*

—Community Member



Model view of Alternative 2, which was preferred by the community.



# ABOUT THE PREFERRED ALTERNATIVE

The images on the following pages illustrate an enhanced vision of the preferred pedestrian bridge concept. The purpose of these images is to represent the scale, the character and the sculptural quality of the preferred pedestrian bridge alternative. The alignment of the bridge responds to the preferred location identified throughout the design and planning process for this feasibility study, and the images showcase the potential programs, features and activities the pedestrian bridge could support.

*It is important to note that these images convey a design intent that remains highly conceptual in nature and will require a thorough design and engineering process to move the project forward from representation during this feasibility study.*





# PREFERRED CONCEPT









The new bridge will create a dynamic new gathering space for the entire community to come together in the heart of the city with opportunities for programming, planting areas, enhanced pedestrian and cyclist mobility, and interpretive elements at key viewsheds.















Access to the new bridge on both the north and south sides of the Lehigh River provides opportunities to activate new plazas and park spaces that create enhanced connectivity. The bridge is envisioned to also act as a beacon and wayfinding device for circulation.



# MY VISION FOR THE

PLEASE SHARE YOUR OWN GUIDING PRINCIPLES, COMMENTS, OR QUESTIONS

PLACE A POST-IT NOTE IN THE BOX BELOW TO SHARE YOUR INPUT, OR

CONNECT GREENWAY TO D+L

PARKING NEAR BRIDGE BOTH SIDES

PROVIDE CONNECTION TO RIVER

PROVIDE GOOD SIGNAGE

RETAIN - WALL ALONG CENTER ST.

MAKE SAME THE A

Family-friendly crossings

New ways to commute!





# BRIDGE IS...

QUESTIONS

EXPAND  
FAHEY BRIDGE  
W/ RAMP  
TO SAND  
ISLAND

WHAT WE ARE MISSING!

CLOSE  
FAHEY  
TO  
CARS

SAFER ROUTES  
FOR  
PROMINENT  
RACES (1/2+  
MARATHON)

Family  
oriented to  
connected  
to  
river

Elevated  
for

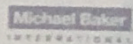
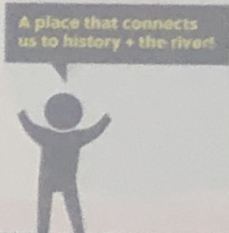
I'd rather see the  
money spent on  
helping like I  
less.  
Maybe work out  
the...

# NEXT STEPS

MAKE CITY  
HALL MORE  
ACCESSIBLE

USE CIRCLE  
RAMPS

ISLAND  
ANCHOR



# LOOKING AHEAD

As this project moves forward, the next major step will be design. Preliminary and then final design phases will overlap with potential property acquisition and permitting prior to the start of construction. During the design phases, the vision that has taken shape during the Feasibility Study and illustrated in this report will be more thoroughly studied and refined in accordance with numerous considerations. Outlined below is a preliminary analysis of several considerations that will be explored moving ahead.

## ENVIRONMENTAL CONSIDERATIONS SUSTAINABILITY

The City of Bethlehem is committed to addressing climate change as demonstrated by its first Climate Action Plan, adopted in 2021. The community and members of the Working Group repeatedly requested that a sustainable approach be applied to the bridge design, including minimizing the overall footprint and environmental impact of the bridge.

As the project moves into the design phase, it is recommended that the following opportunities be explored:

- + Renewable energy such as wind turbines, solar panels etc. that could be incorporated into the bridge/riverwalk to power LED lighting and other needs of the project.
- + Low-embodied energy materials, including locally sourced materials for the bridge construction.
- + Recycled materials for use in benches, tables, trash cans, light poles, etc.
- + Recycled materials from clearing the site prior to bridge construction, and where possible, reclaimed asphalt pavement and crushed concrete should be used for stone aggregate.
- + Rain capture systems to irrigate landscape plantings on the bridge and along the Riverwalk.
- + Low maintenance and drought tolerant native plantings on and near the bridge.

## RIVERBANK ECOLOGY

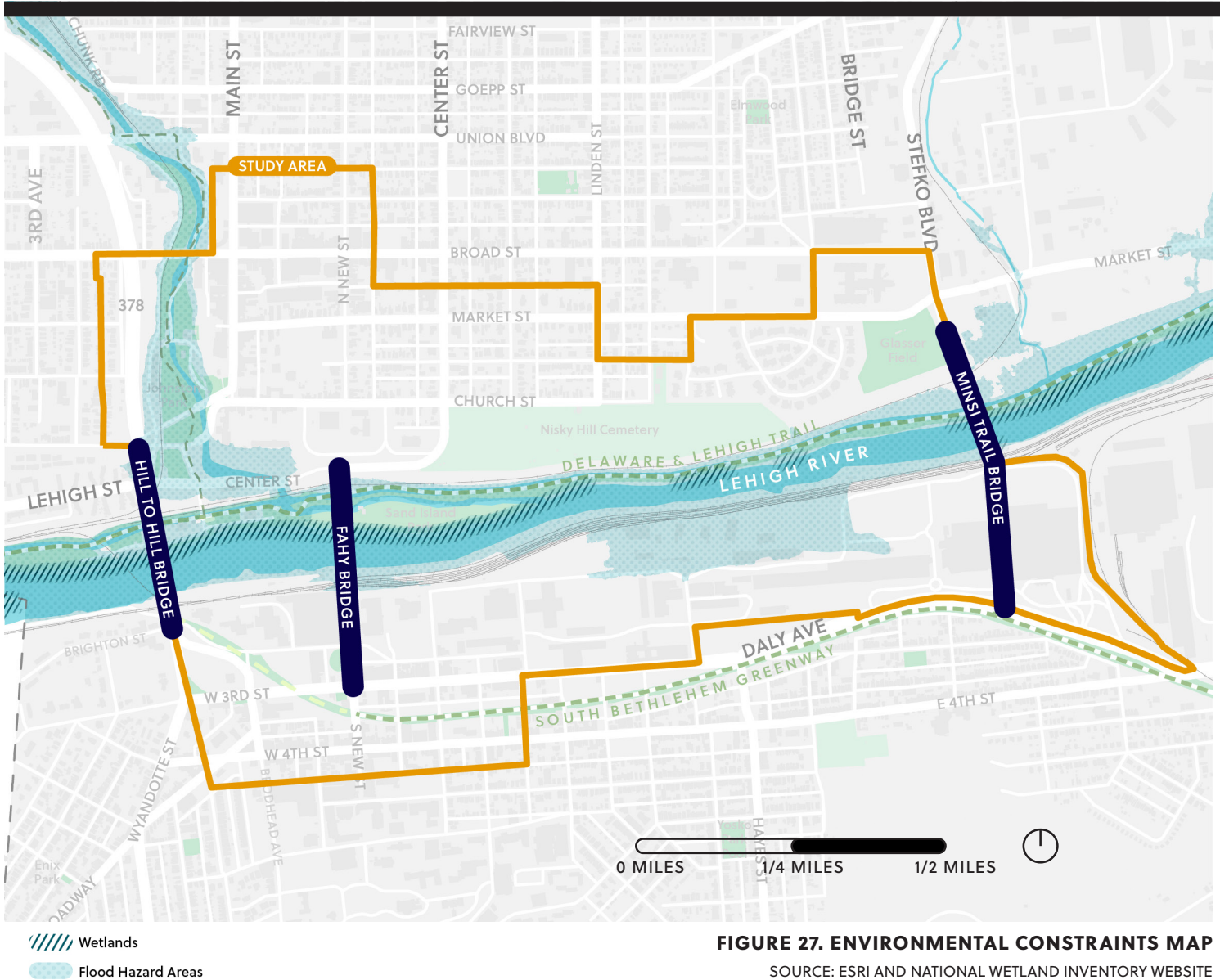
The community and area stakeholders expressed a strong desire to protect and preserve the existing river ecology and minimize disturbance of the riverbank along Sand Island as the design of the new bridge continues to explore the placement of a riverwalk on the north side of the Lehigh River. It is recommended that a detailed survey be conducted by an arborist or certified landscape architect along the riverbank to identify specimen trees that should be preserved, if possible. Other environmental specialists should be consulted to make recommendations related to the construction of the project to minimize impacts on the riverbank's ecology.

## ENVIRONMENTAL CLEARANCE AND PERMIT APPLICABILITY REQUIREMENTS

Background research on environmental permitting required to construct and complete this project indicated that the Lehigh River, (the main stem—Allentown Dam to mouth of the Delaware River), is classified as a Warm Water Fishery, Migratory Fishery (WWF, MF) by the Pennsylvania Department of Environmental Protection (DEP) Chapter 93 Water Quality Standards. The Lehigh River is also a Pennsylvania Fish & Boat (PFBC) Commission Water Trail. An Aids to Navigation (ATON) Plan will be required by the PFBC during construction of the proposed pedestrian bridge. Further, the Lehigh River is designated as a Scenic River by the Pennsylvania Department of Conservation and Natural Resources (PA DCNR). However, this segment of the Lehigh River within the Bethlehem Pedestrian Bridge Feasibility Study area appears not to be designated as a Scenic River and should be verified by coordinating with the PA DCNR once the project location and details are confirmed. In addition, should the proposed pedestrian bridge cross over the Lehigh Coal and Navigation Canal, (part of the Delaware & Lehigh Canal), as illustrated in all of the proposed alternatives, coordination and approvals would likely be required with the owners of the canal and the Pennsylvania State Historic Preservation Office (PA SHPO).

The study area is located over the Lehigh River and within the 100-year floodplain boundary of the river (Figure 27), which is regulated by the PADEP, pursuant to the Chapter 105 regulations Dam Safety and Encroachments Act of 1978. Under the PADEP Chapter 105 regulations, the project will likely qualify





**FIGURE 27. ENVIRONMENTAL CONSTRAINTS MAP**  
 SOURCE: ESRI AND NATIONAL WETLAND INVENTORY WEBSITE

for a Joint Permit, Small Projects Application (JPA) for water obstructions and encroachments. The JPA will also be submitted to the U.S. Army Corps of Engineers (USACE), Philadelphia Regulatory Branch, which has jurisdiction over waters of the U.S., including wetlands through Section 404 of the Clean Water Act. The Small Projects JPA may not apply if the preferred alternative is not located in wetlands or if wetland impacts can be avoided by design.

Other studies that would be required, but not limited to, to prepare and submit a PADEP/USACE JPA, include a wetland identification and delineation, conducting a Pennsylvania Natural Diversity Index (PNDI) search on the Pennsylvania Conservation Explorer screens for potentially impacted threatened and endangered species, special concern species,

and significant ecological features in the vicinity of the selected a feasibility study area. As part of this study, the consultant team completed a preliminary PNDI search, which flagged one potential species of concern in the study area—the Northern Red-Bellied Cooter (aka red-bellied turtle). As the project moves forward, further coordination is requested with the PA Fish and Boat Commission. (Please refer to the letter from the PA Fish and Boat Commission in the Appendix.) Michael Baker International has dealt with this species previously. Typically, a turtle specialist must be hired during design to determine if there is evidence of the turtle in the construction footprint. This species often hibernates in the riverbanks and riverbed in winter and construction in those areas is not allowed during that time period.

Implementing the preferred alternative will require earth disturbance to the likely extent that a PADEP Chapter 102 National Pollutant Discharge Elimination System (NPDES) Pennsylvania General Permit (PAG-02) will be required to protect waterways from soil erosion and sedimentation associated with construction activities that disturb one acre (1.0) or more. An erosion and sedimentation pollution control plan (E&S) will be prepared and likely need to be submitted to either the Lehigh or Northampton County Conservation District depending on the location of the selected alternative for approval depending on the amount of earth disturbance.

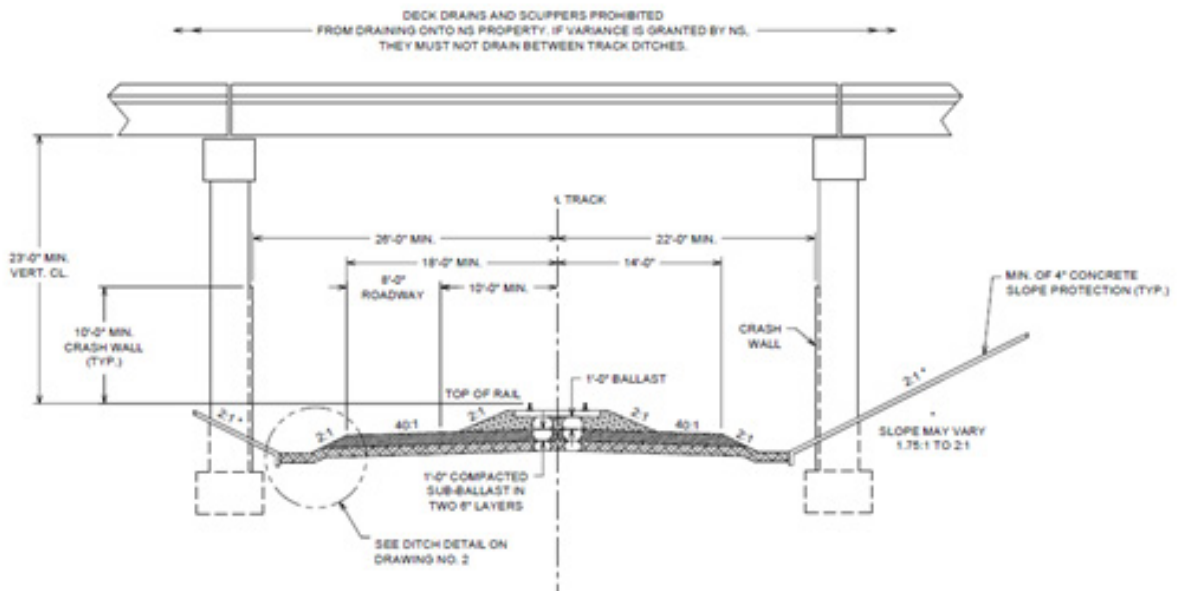
- + Army Corps of Engineers – Wetland identification and delineation report
- + Pennsylvania Natural Diversity Index (PNDI) search
- + PADEP National Pollutant Discharge Elimination System (NPDES) permit
- + Lehigh Co or Northampton Co. Chapter 102 Erosion and Sediment Control permit

**Summary of Environmental Permits, Approvals, and/or Reviews Required:**

- + Pennsylvania Fish & Boat Commission –Aids to Navigation (ATON) Plan
- + Pennsylvania Department of Conservation and Natural Resources – Scenic River Review
- + Pennsylvania State Historic Preservation Office Review for Impacts to Historic and Cultural Resources
- + PADEP/Army Corp of Engineers Chapter 105/404 Joint Permit for Waterway Obstructions

**FREIGHT RAIL**

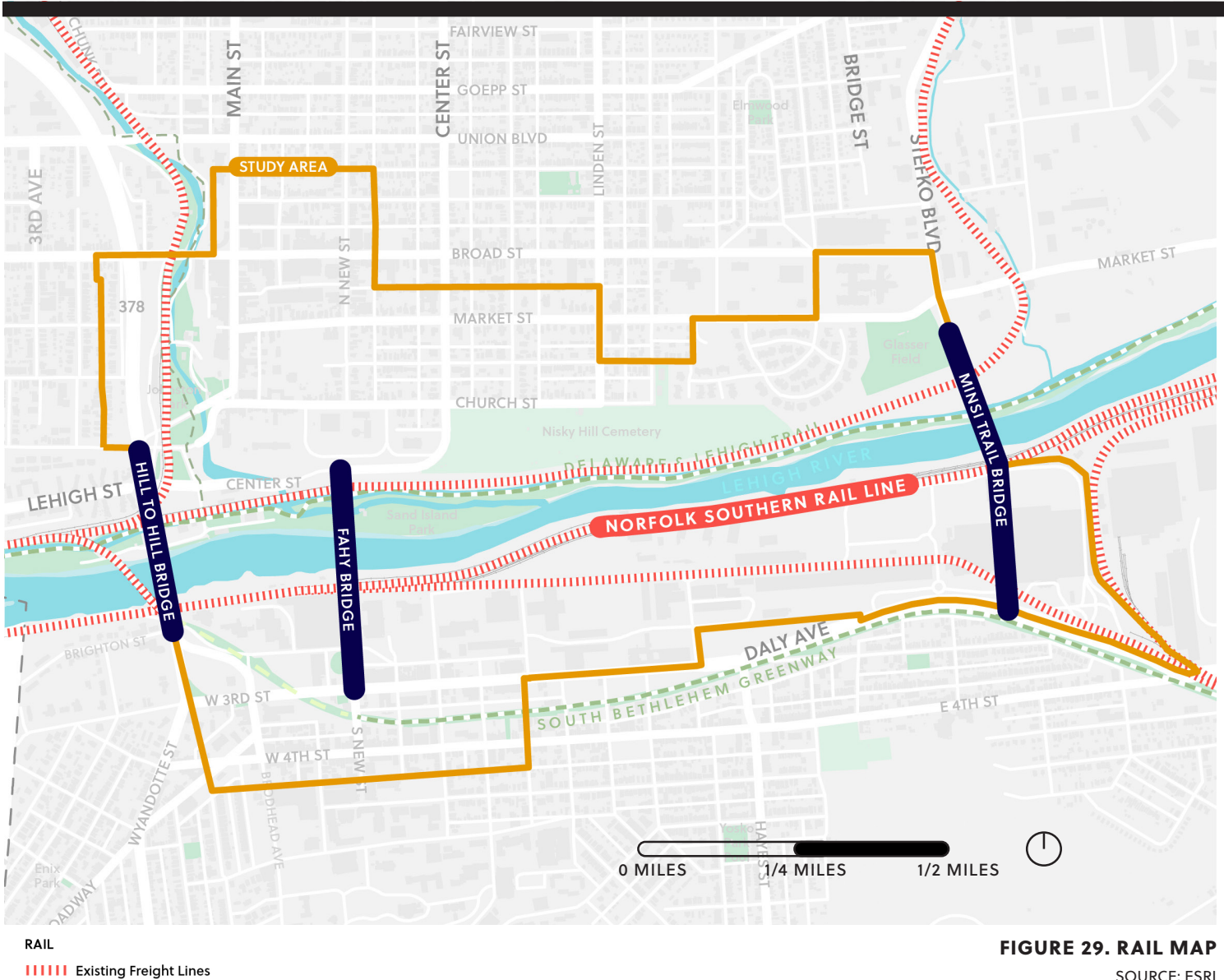
The proposed pedestrian bridge will cross over several rail tracks on the south side of the Lehigh River that are owned and operated by Norfolk Southern (NS). Grade-separated bridges like this proposed structure are acceptable to Norfolk Southern, assuming their requirements as laid out in their Public Projects Manual are followed: “At-grade trail crossings will not be allowed by Norfolk Southern, but trails can be allowed under or over the tracks provided appropriate safety measures are provided and that the project follows the previously described preliminary engineering review and construction monitoring processes.” (Norfolk Southern Public Projects Manual Page 9, Section 5.5 Bicycle/Pedestrian Trails and Crossings).



**FIGURE 28. STANDARDS FOR BICYCLE/PEDESTRIAN TRAILS AND CROSSINGS**

SOURCE: NORFOLK SOUTHERN PUBLIC PROJECTS MANUAL





Safety requirements required by Norfolk Southern include a minimum horizontal clearance of 26' from center line of the nearest track and minimum vertical clearance of 23'-6" as shown in the image below. The horizontal clearance will control how close the bridge piers/abutments can be located to the Norfolk Southern railroad tracks and will have an impact on the bridge span length over the railroad. The 23' vertical clearance will control the initial bottom of beam elevation and height of the structure on the south side of the structure. Edges of footings have to be a minimum of 13' from the centerline of track to allow room for shoring. A fencing system 10' in height above the bridge deck/sidewalk elevation, including a curved top portion, is also required on both sides of the proposed bridge. Alternate fencing details will

be evaluated by Norfolk Southern on a case-by-case basis. Many other requirements for bridges over rail tracks are outlined in the Norfolk Southern Public Projects Manual.

An aerial easement with Norfolk Southern will likely need to be established as part of the bridge construction to allow long-term inspection and maintenance of the various portions of the proposed bridge over top of and on Norfolk Southern property. A separate construction agreement will need to be executed with Norfolk Southern during construction of the bridge to document access arrangements for the bridge construction contractor as well as safety flagging along the railroad tracks during construction. This agreement will also cover

reimbursement to Norfolk Southern for these flagging costs as a cost to the bridge construction project. A Public Utility Commission submission will need to be made during design of the bridge to approve the new grade-separated bridge crossing of the railroad.

The consultant team contacted Norfolk Southern during the feasibility study regarding the proposed bridge. It was indicated that a preliminary engineering agreement needs to be set up between Norfolk Southern and the City to reimburse for their review costs. It is recommended that this agreement be put in place as an immediate short-term next step to advance the required coordination with the Norfolk Southern regarding the bridge project.

## POTENTIAL RIGHT OF WAY ACQUISITIONS

### ALTERNATIVE 1

Starting on the north side of the river, the recommended improvements on West Church Street

and New Street will need to be completed within the existing road right of way and on adjacent City-owned property. Sand Island is also owned by the City of Bethlehem. No acquisitions will be needed in those areas to construct the project. One bridge segment will span over Norfolk Southern property so an aerial easement will likely be needed for that location.

On the south side of the river, an additional aerial easement will be needed to bridge over the Norfolk Southern tracks. A partial acquisition would be required on the OraSure Technologies property at the intersection of Webster Street and East 1st Street. The proposed improvements along Webster Street and Polk Street up to the South Bethlehem Greenway are anticipated to be completed within the existing road right of way or with minor strip easements from adjacent owners. An easement or other arrangement may be needed on the Bethlehem Parking Authority property on Webster Street between 3rd Street and Columbia Street. However, since the city is leading the bridge project, it is not anticipated that this will be a major issue.

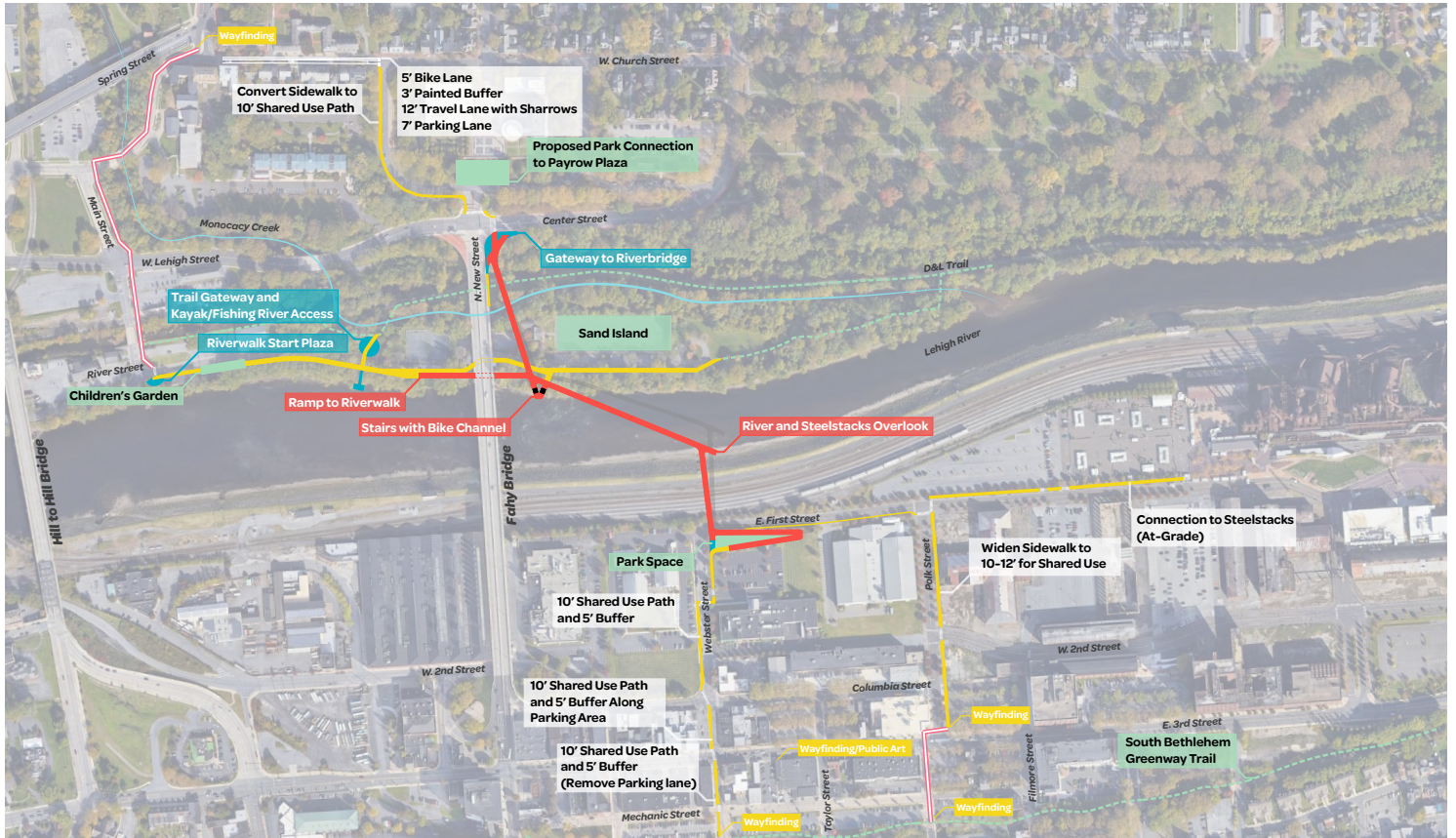
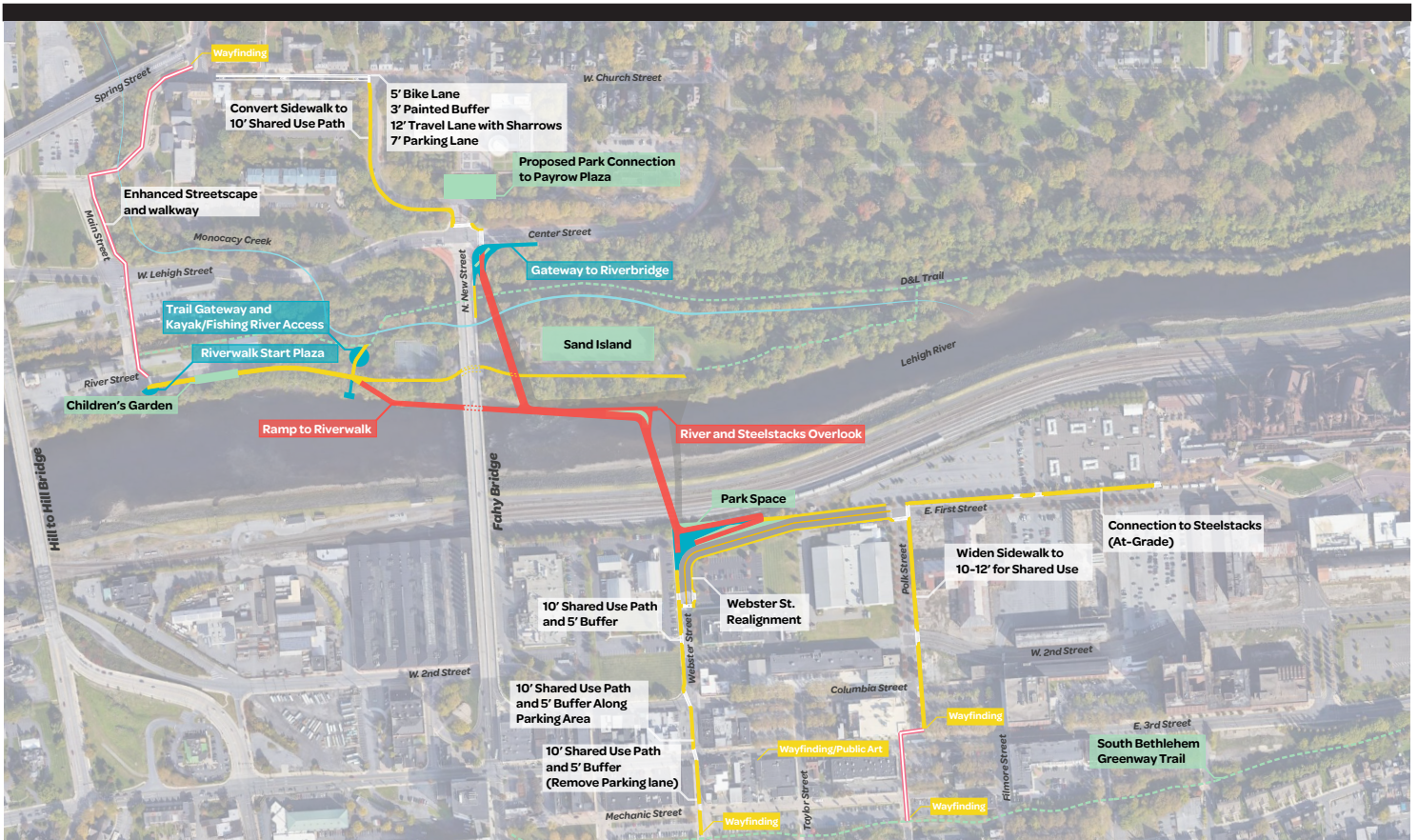


FIGURE 30. ALTERNATIVE 1 – PROPOSED STREETScape IMPROVEMENTS





**FIGURE 31. ALTERNATIVE 2 — PROPOSED STREETScape IMPROVEMENTS**

**Summary:**

**Aerial Easements:**

- + Pennsylvania Lines LLS (aka Norfolk Southern) – Parcel #P6-1-4
- + Lehigh Valley Rail Management (aka Norfolk Southern) – Parcel # P6-2-2-2J)

**Partial Acquisition:**

- + OraSure Technologies Inc. Parcel #P6-2-2D
- + Bethlehem Parking Authority Parcel #P6SE1A-6-1A

**ALTERNATIVE 2**

Starting on the north side of the river, the recommended improvements on West Church Street and New Street will be completed within the road right of way and on adjacent City-owned property. Sand Island is owned by the City of Bethlehem. No acquisitions will be needed in these areas to construct the project. One bridge segment will span over Norfolk Southern property so an aerial easement will likely be needed at that location.

On the south side of the river, an additional aerial easement will be needed to bridge over the Norfolk Southern tracks. Due to the proposed relocation of East 1st Street, a larger acquisition would be required on the OraSure Technologies property at the intersection of Webster Street and 1st Street. The road relocation may also require a strip acquisition on the Steel Ice Center property on East 1st Street. The improvements along Webster Street and Polk Street up to the South Bethlehem Greenway are anticipated to be completed within the existing road right of way or with minor strip easements from adjacent owners. An easement or other arrangement may be needed on the Bethlehem Parking Authority property on Webster Street between 3rd Street and Columbia Street. However, since the city is leading the bridge project, it is not anticipated that this will be a major issue.

**Summary:**

**Aerial Easements:**

- + Pennsylvania Lines LLS (aka Norfolk Southern) – Parcel #P6-1-4
- + Lehigh Valley Rail Management (aka Norfolk Southern) – Parcel # P6-2-2-2J)



Partial Acquisition:

- + OraSure Technologies Inc. Parcel #P6-2-2D
- + Bethlehem Ice Rink LLC Parcel #P6-2-2-3
- + Bethlehem Parking Authority Parcel #P6SE1A-6-1A

**ALTERNATIVE 3**

Starting on the north side of the river, the improvements on West Church Street and New Street will be completed within the road right of way and on adjacent City-owned property. Sand Island is owned by the City of Bethlehem. No acquisitions will be needed in these areas to construct the project. One bridge segment will span over Norfolk Southern property so an aerial easement will likely be needed at that location.

On the south side of the river, an additional aerial easement will be needed to bridge over the Norfolk Southern tracks as well. The improvements within the existing parking area near the intersection of East 1st Street /Polk Street will require an acquisition from the

Bethlehem Works Owners Association property. The recommended improvements along Webster Street and Polk Street up to the South Bethlehem Greenway are anticipated to be completed within the existing road right of way or with minor strip easements from adjacent owners. An easement or other arrangement may be needed on the Bethlehem Parking Authority property on Webster Street between 3rd Street and Columbia Street. However, since the city is leading the bridge project, it is not anticipated that this will be a major issue.

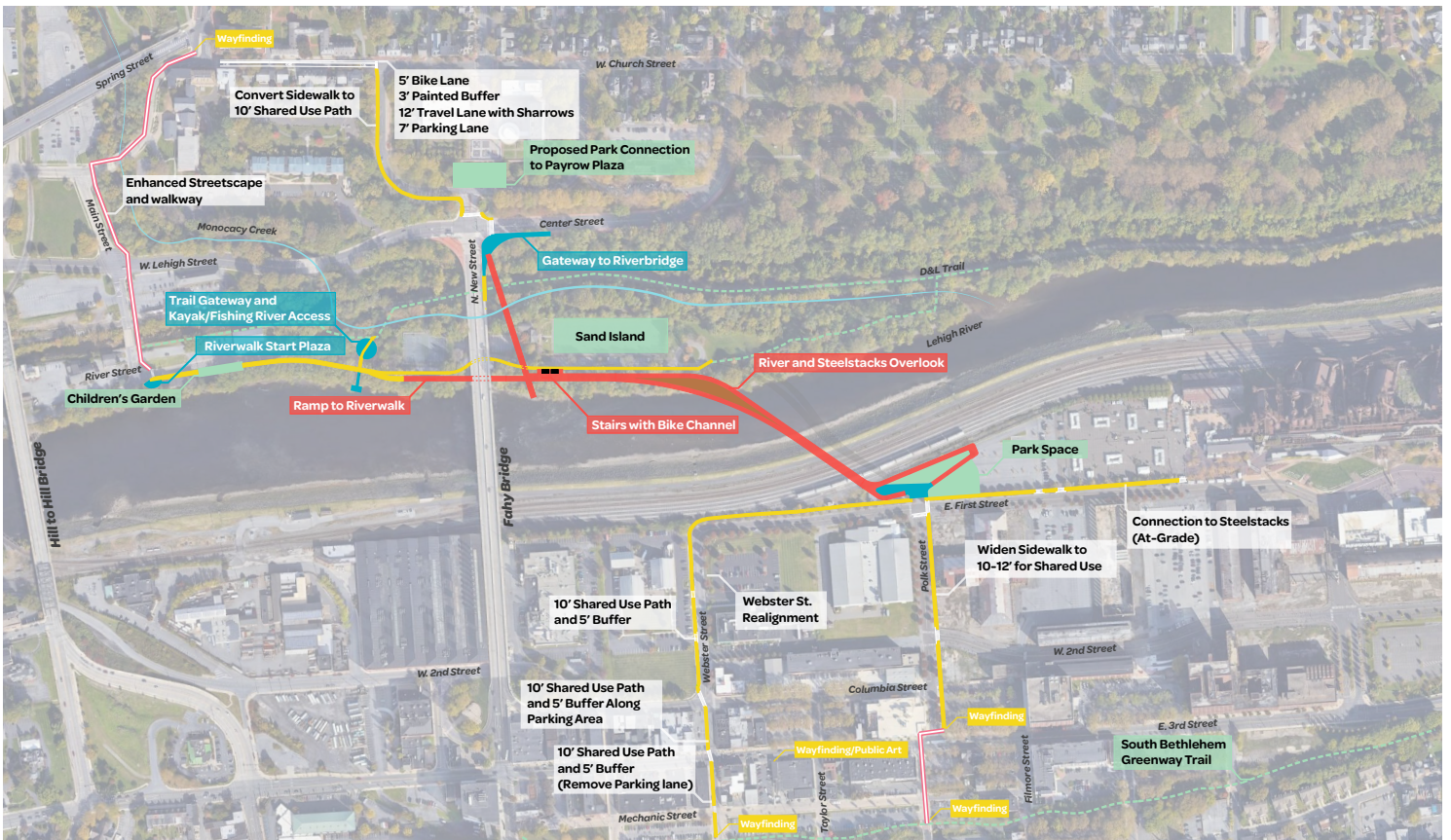
Summary:

Aerial Easements:

- + Pennsylvania Lines LLS (aka Norfolk Southern) – Parcel #P6-1-4
- + Lehigh Valley Rail Management (aka Norfolk Southern) – Parcel # P6-2-2-2J)

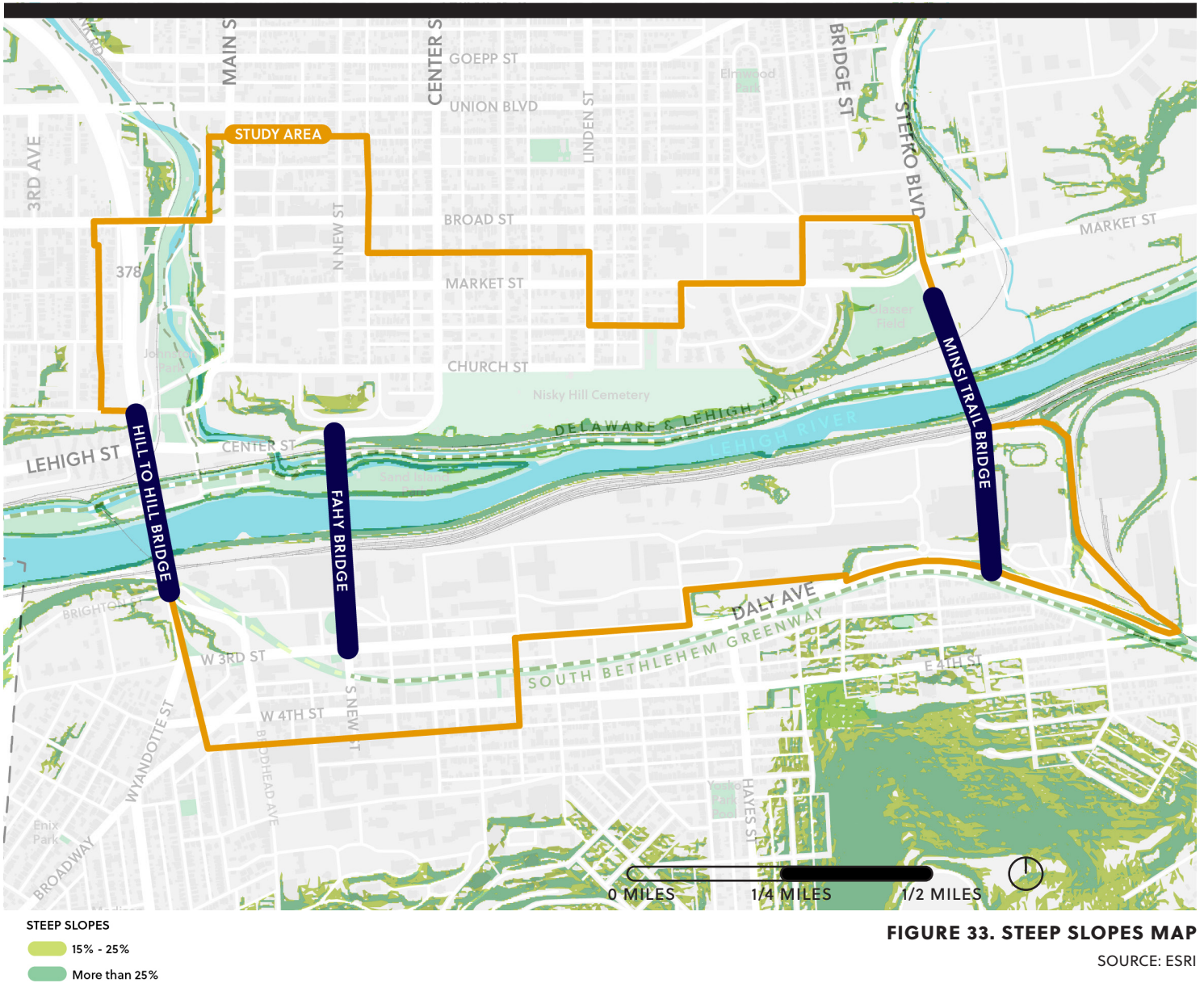
Partial Acquisition:

- + Bethlehem Works Owners Association Parcel # P6-2-2-1
- + Bethlehem Parking Authority Parcel #P6SE1A-6-1A



**FIGURE 32. ALTERNATIVE 3 – PROPOSED STREETScape IMPROVEMENTS**





## UTILITY CONSTRAINTS

An above-ground visual survey of the site was conducted, and no major public/private utility infrastructure was identified. Below-ground utilities within the project area were not investigated in detail. Electric, stormwater, telecommunications/ phone and sewer manholes are present in many of the existing roadways included in the project area. Utility poles carrying electric, internet, phone and other lines are present along several of the streets in the project area. Also, pedestrian-scale lighting with underground electric conduits is located along portions of Webster Street, 1<sup>st</sup> Street and New Street among others. The relocation of 1<sup>st</sup> Street illustrated

in the preferred alternative may require a significantly higher level of utility relocation. A PA One Call will need to be completed in later phases of design to better identify potential conflicts and required relocations of utilities.

## ADA/STEEP SLOPES

A key tenet of the vision for the pedestrian bridge is accessibility for all, regardless of age, physical ability, income, race, gender, or nationality. This is reflected by the Guiding Principle – Safe, Well-Connected & Equitable. In addition, federal funding is anticipated for the project, which would require that the structure full meet the Americans with Disabilities Act (ADA).



The existing conditions found in the study area, however, present significant challenges for accessibility, including an established urban street grid, numerous rail tracks, and grade changes on the Southside and very steep slopes on the North Side. There is also a significant elevation change between the south and north sides of the river to span over the rail tracks, then River Street and connect to Center Street. In addition to providing safe ADA access to the bridge, limiting users from having to go up and down multiple times during a single crossing became another concern.

Initially, we considered elevators but those proved to be cost prohibitive and the outside location in this climate makes long-term maintenance a concern. Stakeholders also indicated that the existing outdoor elevator at SteelStacks is often subject to failure and vandalism. The consultant team then considered a combination of stairs and ramps, with ramps becoming the preferred option by the community.

The maximum ADA-compliant ramp slope is 1' vertical change over 12' horizontal length (8.33% slope). Level landings are required along ramp systems every 30' to serve as rest areas. A level landing can have a 2% maximum slope and a minimum size of 5'x5'. Handrails are also recommended on both sides of the ramps to further aid accessibility. The detailed design of the ramp systems on each side of the bridge will be further refined in later stages of design.

## HISTORIC AND CULTURAL RESOURCE PRESERVATION

There are numerous historic districts and resources as well as potentially eligible resources listed with the National Register of Historic Places (NRHP) in the study area. Detailed coordination will be needed with the Pennsylvania State Historic Preservation Office (PA SHPO), as per Section 106 of the National Historic Preservation Act, during the design phase to evaluate potential impacts of the project on these resources and the documentation required.

There are also locally designated historic districts identified by the City of Bethlehem Historical Architecture Review Board/Historic Conservation Commission. Coordination with these local groups will also be required during design.

The resources summarized on the facing page may be directly or indirectly affected by all three bridge alternatives.



**Direct Effects (in or likely in alignment)**

RESOURCE NAME	PA SHPO ID #	NATIONAL REGISTER STATUS
North Pennsylvania Railroad (Philadelphia to Bethlehem)	1995RE42969	Eligible 07-17-1995 & 09-02-2004
Philadelphia & Reading Railroad	2010RE02630	Unevaluated
South Bethlehem Downtown Historic District	1993RE00386	Listed 01-03-2006
Bethlehem Steel Plant (District)	1990RE00900	Eligible 8-6-1999 (Note: iron foundry at SE corner of Polk and E. First streets is a district contributor)
Lehigh Valley Railroad	2010RE00722	Unevaluated
Central Bethlehem Historic District	1971RE00011	Listed 05-05-1972
Central Bethlehem Historic District (Boundary Increase)	1987RE00235	Listed 11-07-1988
Lehigh Canal: Allentown to Hopeville Section	1979RE00642	Listed 12-17-1979
Lehigh Canal	1975RE00162	Eligible 08-01-1975
Walls and Railings on Sand Island (WPA ca. 1935)	n/a	Contribute to Central Bethlehem Historic District (Listed)
Delaware River Path	2019RE20384	Unevaluated
Central Railroad of New Jersey	2010RE03835	Unevaluated
Hill to Hill Bridge (SR 378)	1972RE00063	Eligible 2-19-2020 & 8-8-2019; also contributes to the Central Bethlehem Historic District
Historic Moravian Bethlehem Historic District	2012RE00593	Listed/NHL 10-16-2012

**Locally Designated Districts in Alignment (require design review)**

NAME	DATE	NOTES
South Bethlehem Conservation District (HDA)	Approved 4-20-1999; boundaries approved 2-1-2000	Reviews demolition, new construction, additions, and fronts of existing structures
North Bethlehem Historic District (HDA)	12-19-1961	PA SHPO ID 1961RE00032

**Consider Visual Effects**

NAME	PA SHPO ID #	NATIONAL REGISTER STATUS
Walls and railings on Sand Island	1995RE31975	Unevaluated; Contributes to Central Bethlehem Historic District (Listed)

## DESIGN CONSIDERATIONS

As the Bethlehem Pedestrian Bridge project moves forward into the design phase, there are several elements to be considered:

- + **Community Engagement:** The idea for a walkable city was nurtured by residents and blossomed into further civic conversations that continued during the Feasibility Study process. For the bridge to be a true success with the support of the community, shaped with residents' visions in mind, an inclusive design process that engages residents of all ages should be integral to efforts going forward.
- + **Guiding Principles:** The Guiding Principles established with the community during the Feasibility Study may continue to evolve during the design phase, but it is very important that they be used as a starting point for the design process and a foundation for its success.
- + **Sustainability:** Residents, stakeholders, and Working Group members made it clear that the bridge design should make every effort to integrate a sustainable design approach that minimizes the impact of the bridge, helps address climate change, and becomes a demonstration of environmentally responsible practices.

- + **Safety, Accessibility, and Equity:** The community echoed the need for safe access to the bridge for all. At the same time, considerations must be explored for power and water service, lighting, and public safety and security access.
- + **Distinctly Bethlehem:** Bethlehem is a city of firsts, with an unquenchable thirst for innovation. It has reinvented itself for the 21st century in a way that is unique to the city. As the design for the bridge comes into sharper focus, it is important that the shape, materials, appearance, and experience of journeying across the bridge be designed in a way that is Distinctly Bethlehem

Continuing to engage the community going forward is critical to the bridge's success.





## NEXT STEPS FOR IMPLEMENTATION

### ESTIMATED TIMELINE

Assuming there are no significant delays and continuous work on the project, the following timeline is anticipated:

- + Grant Writing for Advance Feasibility Study/ Preliminary and Final Design – 2022/2023
- + Advance Feasibility Study (optional) – 2023
- + Grant Writing for Preliminary /Final Design– 2023
- + Preliminary Engineering– 2024 (1 year)
- + Right of Way Acquisition – 2025
- + Grant Writing / Fundraising for Construction– 2025-2026
- + Final Design Engineering and Permitting – 2025-2026 (2 years)
- + Construction – 2027-2028 (2 years)

Since this project will have a significant public benefit for multi-modal transportation in the region and make an important connection between the D&L Trail to Bethlehem and the South Bethlehem Greenway, it is recommended that LVPC and PennDOT be consulted about adding this project as a specific line item on the Regional Transportation Improvement Plan (TIP). This approach will leverage new funding from the Bipartisan Infrastructure Law for this project.

There are also numerous other public and private funding sources available for this project. A list of potential funding opportunities is included in the Appendix.

## CHALLENGES TO IMPLEMENTATION

One of the major constraints facing the realization of a pedestrian bridge is the span over the Norfolk Southern railroad tracks. Near Webster Street, there are seven tracks to span and eight tracks near Polk Street. There are Norfolk Southern maintenance roads on each side of the tracks as well that will likely need to be included in the span length. Depending on skew and exact pier/abutment placement, the span length is anticipated to range from 175'-225' at these locations.

The required horizontal clearance of 26' also needs to be considered as part of the span arrangement and pier/abutment placement. The need for a Norfolk Southern approved crash wall design for the piers will need to be evaluated. And it should be noted that there are a number of large concrete box culverts and pipes along the riverbank that convey stormwater from the city streets to the river. These structures will need to be located and coordinated with the placement of the bridge piers.









# COSTS & POTENTIAL IMPACTS



# COSTS

The following high-level cost estimates for each of the 3 alternatives and the preferred option, described on the previous pages, enable us to understand and clarify where higher overall bridge costs are coming from, as well as cost implications. These estimates were developed by MBI, based on its experience designing bridges around the world. Estimates do not include right-of-way acquisition costs. They do include 20% contingency, design, and construction inspection costs.

## OPERATIONS AND MAINTENANCE COSTS

Similar to any other recreation or transportation facility, periodic and regular maintenance of the proposed riverwalk and bridge will be required. The costs associated with these activities should be incorporated into the long-range budget of the City. The following is a list of the key maintenance activities and the anticipated effort involved:

- + Riverwalk Trail Surface (Paved) – Repairs annually (\$1,000-5,000), Repaving every 15-20 years (\$150,000- \$200,000)

### ALT. 1 EXTEND

**Estimate: \$35m-\$40m**

**Key Cost Drivers:**

- + Steel beams/trusses
- + Riverwalk elements (14' walkway, lighting, fishing pier and significant landscaping)

DESCRIPTION	COST	LENGTH (MILES)
2530' long steel box girder & steel truss bridge with concrete deck	\$31,455,840	0.48
Riverwalk — Northside (Main St. to cul-de-sac)	\$2,027,818	0.35
Bicycle/Pedestrian Connection — Northside (Main St/W. Church St. to New St/Center St.)	\$241,049	0.28
Bicycle/Pedestrian Connection — Webster St. (S. Bethlehem Greenway to East 1st St.)	\$902,755	0.23
Bicycle/Pedestrian Connection — Polk St. (S. Bethlehem Greenway to East 1st St.)	\$360,754	0.23
<b>Total</b>	<b>\$34,988,217</b>	<b>1.57</b>

### ALT. 2 SHIFT

**Estimate: \$46m-\$50m**

**Key Cost Drivers:**

- + Wider bridge width
- + Realignment of 1st Street

DESCRIPTION	COST	LENGTH (MILES)
3000' long precast concrete beam bridge with concrete deck	\$41,796,300	0.48
Riverwalk — Northside (Main St. to cul-de-sac)	\$2,027,818	0.35
Bicycle/Pedestrian Connection — Northside (Main St/W. Church St. to New St/Center St.)	\$241,049	0.28
Bicycle/Pedestrian Connection w/ Road Realignment — Webster St. (S. Bethlehem Greenway to East 1st St.)	\$1,943,660	.34
Bicycle/Pedestrian Connection — Polk St. (S. Bethlehem Greenway to East 1st St.)	\$360,754	0.23
<b>Total</b>	<b>\$46,369,582</b>	<b>1.68</b>



- + Bridges – inspected every two years by a certified professional (\$20,000-40,000)
- + Drainage structures- cleaned annually (\$1,000-\$5,000)
- + Mowing of Riverwalk / trailside areas- minimum of 4 times / year (\$1,000-\$2,000)
- + Tree Trimming – annually (\$1,000-\$5,000)
- + Litter Pickup/Trash Collection – biweekly and as needed (\$1000-\$2000)
- + Signage/Gates/Bollards – repair/replace as required (\$500)

Operational costs for items such as lighting are anticipated to be little or none since these will be powered by solar panels/wind turbines.

Based on our experience and data from other existing trails, parks and bridges, annual maintenance costs are anticipated to range from approximately \$30,000-\$50,000 per year. Once the bridge and Riverwalk trail is open, future budgets should be based on actual costs from the first few years of operation.

### ALT. 3 ROOMS

**Estimate: \$83m-\$85m**

**Key Cost Drivers:**

- + Specialty steel structure with wider bridge width
- + Larger plaza at 1st Street

DESCRIPTION	COST	LENGTH (MILES)
2990' long cable-stayed bridge with concrete deck	<b>\$79,700,400</b>	.48
Riverwalk — Northside (Main St. to cul-de-sac)	<b>\$2,027,818</b>	0.35
Bicycle/Pedestrian Connection — Northside (Main St/W. Church St. to New St/Center St.)	<b>\$241,049</b>	0.28
Bicycle/Pedestrian Connection — Webster St. (S. Bethlehem Greenway to East 1st St.)	<b>\$902,755</b>	0.23
Bicycle/Pedestrian Connection w/ Large 1st St. Plaza — Polk St. (S. Bethlehem Greenway to East 1st St.)	<b>\$750,754</b>	0.23
<b>Total</b>	<b>\$83,622,777</b>	<b>1.57</b>

### PREFERRED ALTERNATIVE

**Estimate: \$52m-\$55m**

**Phasing:**

- + Planning (1%): \$514,883
- + Preliminary & Final Design (20%): \$10,297,666
- + Construction: \$40,675,782

DESCRIPTION	COST	LENGTH (MILES)
3000' long precast concrete beam bridge with concrete deck	<b>\$46,915,050</b>	.48
Riverwalk — Northside (Main St. to cul-de-sac)	<b>\$2,027,818</b>	0.35
Bicycle/Pedestrian Connection — Northside (Main St/W. Church St. to New St/Center St.)	<b>\$241,049</b>	0.28
Bicycle/Pedestrian Connection w/ Road Realignment — Webster St. (S. Bethlehem Greenway to East 1st St.)	<b>1,943,660</b>	.34
Bicycle/Pedestrian Connection — Polk St. (S. Bethlehem Greenway to East 1st St.)	<b>\$360,754</b>	0.23
<b>Total</b>	<b>\$51,488,332</b>	<b>1.68</b>

# POTENTIAL IMPACTS

In May 2022, Econsult Solutions Inc. completed an economic impact analysis for the pedestrian bridge project. The goal of the study was to understand and, where possible, quantify the impact of the pedestrian bridge on the City of Bethlehem's economic competitiveness and road maintenance, and its residents' quality of life and safety. Outlined below are some of the notable findings. A full copy of the report is included in the Appendix.

## Economic Competitiveness

Economic competitiveness benefits relate to how Bethlehem competes as a destination for people, investment, and economic activity against surrounding localities as well as against other regions. The greater the number and strength of a locality's various assets, the better it can compete for these economic advantages.

The current lack of high-quality pedestrian and cyclist infrastructure across the Lehigh River curtails the economic competitiveness of the city in several ways. With regard to talent attraction and retention, workers are increasingly less tied to the location of their employer and more interested in denser, mixed-use areas where they can get around quickly and easily to work, live, and socialize.

Enhanced walking and cycling conditions tend to increase property values and rents, attract new businesses, and increase local economic activity.

Providing a safe alternative for pedestrians and cyclists also has the potential to reduce vehicle miles traveled. Currently approximately 80,000 trips are taken across the 3 area bridges each day. It is estimated that the new pedestrian bridge will induce additional cycling and pedestrian activity, resulting in approximately 170,000 new pedestrian trips and 137,000 new cyclist trips per year. Based on the modeled increase in bicycle and pedestrian trips, there will be an increase in spending of more than \$6 million annually at local businesses.

*Based on the modeled increase in bicycle and pedestrian trips, an increase in spending of more than \$6 million annually at local businesses is anticipated.*

Artistic elements and placemaking features are planned to be integrated into the bridge design, enhancing the city's attractiveness to visitors. Based on research from numerous studies, the impact of the new pedestrian bridge is estimated to increase visitor spending at Bethlehem businesses by 15%. These impacts are estimated to be clustered around the waterfront, but some impacts will extend beyond, as visitors and tourists travel throughout the city. This effect is estimated to impact 20% of businesses in Bethlehem.

## Property Values

Generally speaking, walkability is desirable. Home values tend to increase when nearby improvements to walkability are made. When new housing is available and attractive in walkable neighborhoods, it can command a premium of \$20,000 for similar amounts of living space. And as noted above, increased walkability would likely promote additional trips in the downtown. These impacts are capitalized into property value, reflecting an enduring increase in economic vitality for the area. The overall impact on residential and commercial property value is anticipated to be more than \$60 million.

*The overall impact on residential and commercial property value is anticipated to be more than \$60 million.*



## Health, Safety, and Wellness

In addition to expanded opportunities for recreation and the associated health benefits, well maintained public spaces and parks, such as beautified trails and paths, are directly associated with reductions in crime, heightened community strength, and overall community happiness. The analysis estimates that there will be approximately 1,900 new walkers/runners and 1,600 recreational bikers, as well as additional activity from current trail users.

*It is estimated that the addition of a new non-vehicular bridge will give rise to approximately 1,900 new walkers/runners and 1,600 recreational bikers.*

## Reduced Vehicle Miles Traveled and Air Pollution

Increasing safe pedestrian and cycling conditions is predicted to result in a total reduction of approximately 67,000 vehicles miles traveled. Shifting trips to non-vehicular travel eliminates the emissions previously generated by those trips. Avoided emissions include NO<sub>x</sub>, SO<sub>2</sub>, CO, PM<sub>10</sub>, and CO<sub>2</sub>, which are major contributors to air pollution and climate change. This will contribute significantly to the City's Climate Action Plan goals.

## WHAT DID THE IMPACT ANALYSIS CONSIDER?

Specifically, the analysis attempted to understand how the pedestrian bridge would impact:

- + **Economic Competitiveness**
  - Talent Attraction & Retention
  - Development & Job Growth
  - Pedestrian & Cycling Levels
  - Consumer & Tourism Activity
  - Property Values
- + **Quality of Life**
  - Recreation
  - Lived Experience
  - Parking Cost
  - Health
  - Air Pollution (from cars)
- + **Safety**
  - Traffic Crashes
  - Pedestrian and Bicycle Crashes
- + **State of Repair**
  - Road Maintenance
  - Car Crashes









7

# APPENDIX



# CASE STUDIES

## THE DUBLIN LINK

Dublin, OH



**FIGURE 37. DUBLIN LINK**

The 760' long bridge spans the Scioto River, connecting the east and west sides of the City.

SOURCE: VISITDUBLINOHIO.COM

### GENERAL

The Dublin Link, a pedestrian bridge at the center of a larger development plan for the City of Dublin Ohio, opened in March 2020. Upon completion, the bridge became the longest single tower S-suspension bridge in the world, spanning a distance of 760 feet. The walking path is 14 feet wide; the tower is 169 feet tall; and there is a total of 43 suspension cables.

The bridge itself cost \$22.6 million dollars following a 2017 contract with Kokosing Construction, representing a key feature in over \$120 million dollars of public and private investment in the City's downtown over the next couple of years. The bridge links Historic Dublin with Bridge Park, and its origins can be traced to The Community Plan, devised in 2007.

### RECREATION

Riverside Crossing Park is another key feature of the development plan that is still under construction. When completed, the park will add a recreation feature at its base, on the opposite end of Bridge Park. Additionally, there is existing open space along the Scioto River, and existing connections to multi-use paths.



## BUSINESS/ECONOMIC DEVELOPMENT

The bridge is a centerpiece of ongoing downtown investment and development, helping to create the Bridge Street District as a focal point of new development in the City. The City refers to the area as “an entertainment, dining, retail and office destination with riverfront parks and appealing housing choices. This urban, walkable district is an economic development driver – creating new jobs, attracting a talented, young workforce, and retaining seasoned professionals.” The bridge helps connect two distinct areas of the City that were previously

separated: The Bridge Street District and Historic Dublin. Additionally, the bridge provides waterfront connectivity, access to an array of amenities, and creates new economic competitiveness for the City and region.

## EVENTS/PROGRAMMING

The Dublin Link’s connection to the Bridge Street District has been a weekly host of The Dublin Market every Saturday, running through September 2021. More events are expected to be planned following the completion of the entire development.



## LIBERTY BRIDGE

Greenville, SC



**FIGURE 38. LIBERTY BRIDGE**

### GENERAL

Built in 2004 to honor Liberty Corporation founder W. Frank Hipp and his children for a total of \$4.5 million. The bridge is 345 feet long, 12 feet wide, and 8 inches thick. It was designed by Miguel Rosales, a Boston-based architect from Rosales and Partners. Designed as an ultra-lightweight bridge, it features two masts, cable suspension and follows an S-shape. The project was funded using the City of Greenville’s Hospitality Tax, of which funds must be spent on tourism related facilities.

### RECREATION

The Liberty Bridge took advantage of natural recreation areas that were present surrounding the banks of the Reedy River, which the bridge crosses. Taking the place of an outdated overpass, the new bridge allows better access to ample open green

The bridge helped transform the City from a decaying textile town to a thriving modern city, seeing rapid growth in the years since its construction.

SOURCE: SOURCES: GREENVILLE JOURNAL, GREENVILLE COUNTY WEBSITE, CITY OF GREENVILLE WEBSITE

space below the bridge. Additionally, the bridge overlooks natural waterfalls and the gardens at Falls Park, providing access to both and becoming a popular leisure area, and play area for children.

### BUSINESS/ECONOMIC DEVELOPMENT

The bridge helped give the West End section of the City a more stylish reputation and allowed the City to compete as a modern entity amongst other growing cities in the region. The bridge helped transform



the City from a decaying textile town to a thriving modern city, seeing rapid growth in the years since its construction. Previously, most development in the area was contained to the East Side and suburban areas of Greenville County, while Downtown and the West End were neglected. The population was cut off from Falls Park and the waterfalls when the old overpass was in place. However, since the development of Liberty Bridge, development has vastly improved downtown areas and the West End, creating a more balanced City, and opened up access to natural features.

## TOURISM

In addition to being a major attraction for the region at-large, The Liberty Bridge is a key site for local historical tourism. It was constructed at the site of the first trading post in Greenville, which was established by Richard Pearis in 1768.

## EVENTS/PROGRAMMING

As a focal point in the City, the Liberty Bridge takes part in many local events. For example, the Upstate Shakespeare Festival is held each year in Falls Park, which provides free shows for audiences. Additionally, the bridge is home to an annual run called the Liberty Bridge Jump Run.

## OTHER

During design, an emphasis was placed on soft lighting to provide a delicate appearance at night. Upstate Shakespeare Festival is held each year.



## PROVIDENCE PEDESTRIAN BRIDGE

Providence, RI



**FIGURE 39. PROVIDENCE PEDESTRIAN BRIDGE**

The bridge is a destination in and of itself as well as a safe crossing with seating areas, landscaping, and dramatic lighting.

SOURCE: THE ARCHITECTS NEWSPAPER, DEZEEN MAGAZINE, GOPROVIDENCE.COM

### GENERAL

Built on an old highway route, the Providence Pedestrian Bridge crosses Providence River, connecting East Providence to the new Innovation and Design District. The Bridge is 394 feet long, and rests upon granite piers remaining from Interstate 195, which was re-routed in 2013. The bridge was completed in 2019 by Detroit-based architecture firm inFORM studio and structural engineer Buro Happold.

### RECREATION

The bridge is the centerpiece of the Waterfront Park Master Plan and serves as the link between two parks of open green space, East Park and West Park. The bridge connects to existing trail networks along the waterfront areas of Providence River, connecting both sides of the City to nearby Providence Mall. West

Park specifically is a new 7-acre park that was created as part of the Jewelry District Master Plan for the Western portion of Providence.

### BUSINESS/ECONOMIC DEVELOPMENT

The construction of the bridge has coincided with the growth of the new Innovation and Design District in Providence, which is now directly linked, an area that was previously bisected by the river and Interstate 195. These developments are part of a pattern of urban redevelopment, turning old industrial parcels into sleek hotels, shops, restaurants, and



academic centers. It is estimated that 14% of the City's population lives within one mile of the bridge, and 60,000 individuals work within one mile of the bridge. As a result, the area has become a bustling heart of new development, especially new business facilities such as the Wexford Innovation Center, with the bridge inviting residents to explore the urban landscape. Finally, Providence is an academic city with many universities, and the bridge has served as a connector between campuses. Brown University's main campus and medical campus are now connected, along with Johnson & Wales University and the Rhode Island School of Design.

## EVENTS/PROGRAMMING

The bridge played host to a Community Celebration in 2019 that was attended by the mayor, and featured performances from local bands. The event culminated in an illumination procession across the bridge. It is expected that more community events will be held near the bridge and park areas once Covid-19 restrictions are lifted.

## OTHER

The project benefitted by using the existing granite piers that were left over from Interstate 195, helping to lower construction costs. Overall, the project cost totaled \$21.9 million.

The wood surfacing enhances the natural feel of the structure. Multiple levels and variable width make the bridge more functional for community events.



# POTENTIAL FUNDING SOURCES

Outlined below are a several organizations and programs that provide funding in support of trails, greenways, and transit-related projects.

## PENNSYLVANIA TRANSPORTATION ALTERNATIVES PROGRAM

The Transportation Alternatives Set-Aside (TASA) provides funding for projects and activities defined as transportation alternatives, including on- and off-road pedestrian and bicycle facilities, infrastructure projects for improving non-driver access to public transportation and enhanced mobility, community improvement activities, and environmental mitigation, trails that serve a transportation purpose, and safe routes to school projects.

Visit: <https://www.penndot.gov/ProjectAndPrograms/Planning/Pages/Transportation%20Alternatives%20Set-Aside%20-%20Surface%20Trans.%20Block%20Grant%20Program.aspx>

## DCED ACT 13 GRANTS: GREENWAYS, TRAILS AND RECREATION PROGRAM (GTRP)

Act 13 of 2012 establishes the Marcellus Legacy Fund allocates funds to the Commonwealth Financing Authority (the "Authority") for planning, acquisition, development, rehabilitation and repair of greenways, recreational trails, open space, parks and beautification projects using the Greenways, Trails and Recreation Program (GTRP).

Visit: <http://www.newpa.com/find-and-apply-for-funding/funding-and-program-finder/greenways-trails-and-recreation-program-gtrp>

## DCED MULTIMODAL TRANSPORTATION FUND

The Multimodal Transportation Fund provides grants to encourage economic development and ensure that a safe and reliable system of transportation is

available to the residents of the commonwealth. Funds may be used for the development, rehabilitation and enhancement of transportation assets to existing communities, streetscape, lighting, sidewalk enhancement, pedestrian safety, connectivity of transportation assets and transit-oriented development.

Visit: <https://dced.pa.gov/programs/multimodal-transportation-fund/>

## PENNDOT MULTIMODAL TRANSPORTATION

Act 89 also established a dedicated Multimodal Transportation Fund that stabilizes funding for ports and rail freight, increases aviation investments, establishes dedicated funding for bicycle and pedestrian improvements, and allows targeted funding for priority investments in any mode.

Visit: <https://www.penndot.gov/ProjectAndPrograms/MultimodalProgram/Pages/default.aspx>

## PENNDOT – SURFACE TRANSPORTATION PROGRAM

The Twelve-Year Transportation Program (as required by Act 120 of Pennsylvania State Law and its amendments) targets the Commonwealth's improvement efforts in all major transportation modes: highways, bridges, aviation, rail and transit. Transportation projects that focus on improving safety, enhancing mobility, moving goods and preserving the existing system are key to achieving the Department's goals and objectives. The Division will continue to focus on incorporating the philosophy of the most current Federal and State Regulations in the continuous update of the Program. This includes the tie-in of planning requirements for Transportation Improvement Plans (TIPs), and the all-encompassing State TIP (STIP).

This program also involves the preparation of comprehensive information packages for key Department staff, the State Transportation Commission (STC), and elected state and federal legislators and officials. These packages facilitate and communicate the development of a transportation system responsive to the needs of the Commonwealth, monitors progress on key programs and projects, and aids in resolving outstanding Transportation Program issues. Staff and support services are also provided to the STC and other Program Center functions to prepare improvement



programs which maintain and enhance the existing transportation system.

Visit: <https://lvpc.org/tip.html>

## FHWA RAISE GRANT

The Rebuilding American Infrastructure with Sustainability and Equity, or RAISE Discretionary Grant program, provides a unique opportunity for the DOT to invest in road, rail, transit and port projects that promise to achieve national objectives. Previously known as the Better Utilizing Investments to Leverage Development (BUILD) and Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grants, Congress has dedicated nearly \$9.9 billion for thirteen rounds of National Infrastructure Investments to fund projects that have a significant local or regional impact.

Visit: <https://www.transportation.gov/RAISEgrants/about>

## ROBERT WOOD JOHNSON FOUNDATION

The mission of the Robert Wood Johnson Foundation is to improve the health and health care of all Americans, with a clear goal: To help our society transform itself for the better.

Visit: <http://www.rwjf.org/grants/>

## WILLIAM PENN FOUNDATION

The William Penn Foundation, founded in 1945 by Otto and Phoebe Haas, is dedicated to improving the quality of life in eastern Pennsylvania through efforts that foster rich cultural expression, strengthen children's futures, and deepen connections to nature and community. In partnership with others, the Foundation works to advance a vital, just, and caring community.

Visit: <http://www.williampennfoundation.org/Grants.aspx>

## NATIONAL PARKS SERVICE – TRAILS ASSISTANCE PROGRAM

The Rivers, Trails, and Conservation Assistance Program is the community assistance arm of the National Park Service. RTCA supports community-led natural resource conservation and outdoor recreation projects. RTCA staff provides technical assistance to communities so they can conserve rivers, preserve open space, and develop trails and greenways.

Visit: <http://www.nps.gov/nrcr/programs/rtca/>

## PA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES – KEYSTONE GRANT PROGRAM AND RECREATIONAL TRAILS PROGRAM

Established on July 1, 1995, the Pennsylvania Department of Conservation and Natural Resources is charged with maintaining and preserving the 117 state parks; managing the 2.1 million acres of state forest land; providing information on the state's ecological and geologic resources; and establishing community conservation partnerships with grants and technical assistance to benefit rivers, trails, greenways, local parks and recreation, regional heritage parks, open space and natural areas.

Local governments, county governments and non-profit organizations can apply for Community Conservation Partnerships Program (C2P2) funding to assist them with addressing their recreation and conservation needs as well as supporting economically beneficial recreational tourism initiatives.

Visit: <https://www.dcnr.pa.gov/Communities/Grants/TrailGrants/Pages/default.aspx>

## DELAWARE AND LEHIGH NATIONAL HERITAGE CORRIDOR

To help support current and future partners, we disperse funding for projects that further efforts of making the trail safe, accessible, and enjoyable for all. Grant funding is available for a variety of projects including funding conservation, to install trail amenities and host trail related events.

Visit: <https://delawareandlehigh.org/partner-resources/grant-opportunities/>

## HARRY C. TREXLER TRUST

During the more than 85 years of its operation, the Trust has aided the work of Lehigh County charities by providing them with nearly \$172 million in funding, including more than \$57 million to the City of Allentown for the "improvements, extension and maintenance of all its parks." General and Mrs. Trexler's generosity toward the citizens of Allentown and Lehigh County continues through this Trust.

Visit: <https://trexlertrust.org/grantseekers/>



**BRIDGE**  
**BETHLEHEM**



# ADDITIONAL DOCUMENTS

In addition to the appendix herein,  
the following documents are provided  
as supplementary information to this  
Feasibility Study Report:

+ Species Impact Review

+ Economic Impact Analysis

# BRIDGE BETHLEHEM

