Leveraging Regenerative Buildings to Drive Economic, Social, and Cultural Change: Learnings from Pittsburgh

Report of Findings

JUNE 2024

PHIPPS CENTER FOR SUSTAINABLE LANDSCAPES. PHOTO CREDIT: DENMARSH PHOTOGRAPHY, INC

INTERNATIONAL **LIVING FUTURE** INSTITUTE℠

This Report of Findings is an output of a one-year grant from The Heinz Endowments, which seeks to leverage the great work of Pittsburgh to both inspire local change and help those beyond western Pennsylvania harness the wisdom of local communities.

The report identifies and shares tools, resources, best practices, and success stories to elevate the voices and opportunities for Pittsburgh's community-based organizations as well as to evolve and improve the rigor, impact, and access of ILFI's Living Building Challenge (LBC).

Acknowledgments

Funded By

The Heinz Endowments
Howard Heinz Endowment • Vira I. Heinz Endowment

The Heinz Endowments seeks to help our region thrive as a whole and just community and, through that work, to model solutions to major national and global challenges. The foundation is devoted to advancing its vision of southwestern Pennsylvania as a vibrant center of creativity, learning, and social, economic, and environmental sustainability. Its work is supported by reliable data based on equitable, results-focused goals to cultivate a world where all are treated with fairness and respect and have the opportunity to reach their fullest potential.

Project Team

Many International Living Future Institute staff members contributed to this work including:

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- Jessica Bristow, Director of Living Building Challenge, Programs + Innovation
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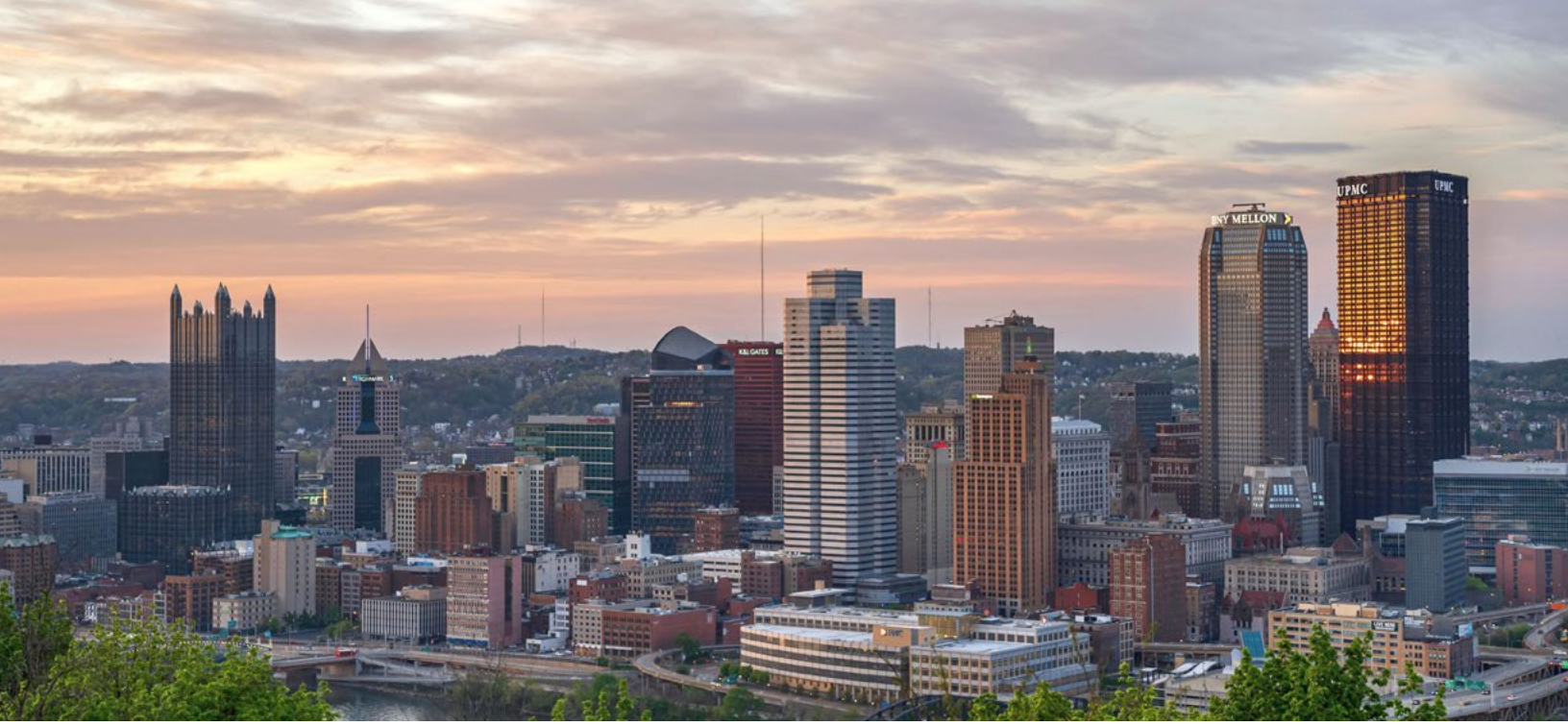
- Cheryl Tam, Director of Social Equity, Programs + Innovation

Additional Contributors

- Melissa Marsh, Founder & Executive Director of PLASTARC, Independent Consultant
- Varis Niwatsakul, Studio Lead at PLASTARC, Independent Consultant



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Introduction

The International Living Future Institute's (ILFI or the Institute) mission is to cultivate a society that is socially just, culturally rich, and ecologically restorative. Our work is driven by a belief that a compelling vision for the future is needed to reconcile humanity's relationship with the natural world. Over the past decade, the Institute has served as an incubator for more than 180 regenerative buildings that have achieved one of ILFI's building certifications - Living Building Challenge (LBC), Core Certification (LBC Core), Zero Energy Certification, and Zero Carbon Certification. Individually, these examples serve as beacons showing what is possible and as catalysts for change creating ripple effects far beyond the site boundaries. Collectively, these projects create a vision of a Living Future.

LIVING BUILDING CHALLENGE™ | CORE GREEN BUILDING CERTIFICATION | ZERO CARBON CERTIFICATION | ZERO ENERGY CERTIFICATION

Since its launch in 2006, LBC has been the building industry's most visionary and holistic standard for regenerative design and construction. LBC is not just a certification program for buildings; it is a creative framework for imagining the future, an advocacy tool to help push public and private policy as well as market transformation, and a platform that allows us to celebrate achievements and showcase buildings as beacons for change. LBC's seven Petals and 20 Imperatives cover a full range of factors for creating net positive impacts for the environment, the building occupants and users, and the surrounding community. In particular, the Place, Equity, and Beauty Petals include requirements aimed at positively impacting the economic, social, and cultural health of the local and regional community through activities

such as job creation, workforce development, neighborhood revitalization, designing for universal access and accessibility, creation of open space, and community engagement.

While LBC has led the way in centering equity in the built environment, we know it can and needs to do more. Over the past few years, there has been an increased awareness of the interconnectivity between social equity and the built environment, illuminating the importance of the building industry as a critical player in the transition to healthy, equitable, and sustainable communities. Many in the building industry look to ILFI and LBC to continue providing and evolving aspirational yet practical frameworks, resources, and tools that achieve and measure progress on social, environmental, and health impacts.

The building industry already has clear and rigorous strategies for achieving and measuring impacts on the environment and building occupants. For example, we know how to measure energy and greenhouse gas reductions, water savings, and indoor air quality, and we can assess if the design and process strategies are working to meet these goals. However, much less is understood about achieving and measuring a building's positive impact on the community. LBC includes some approaches for this, but we know this is an area where the program has room to grow. The good news is that while building industry stakeholders may not know the best way to do this, many community-based organizations have been successfully contributing positive community impact for years—learning and evolving their approaches over time to

PHIPPS EXHIBIT STAGING CENTER. PHOTO CREDIT PAUL WIEGMAN.

maximize benefit. These groups hold wisdom, knowledge, and skills that the building industry can connect to, learn from, and elevate in each building project—combining efforts to leverage positive change and outcomes across communities.

Since 2015, The Heinz Endowments has been a strong supporter and partner in this work in Pittsburgh. Together, ILFI and Heinz have joined with others to strengthen Pittsburgh's regenerative building community and help to make it a leading city in this movement. With four buildings certified under LBC[1] and several more in process,[2] Pittsburgh provides a unique laboratory for understanding how Living Buildings and community-based organizations can serve as anchor institutions and "beacons of change" to model initiatives that support job creation, equitable communities, and more. ILFI seeks to learn from community-based organizations as well as connect them with Pittsburgh's building industry to help provide more opportunities for these organizations to influence and participate in the creation of a healthy, sustainable, and equitable built environment in Pittsburgh.

Through research, interviews, surveys, and review of building certification documentation, ILFI worked with and learned from Pittsburgh's regenerative building community as well as community-based organizations that are successfully driving economic, social, and cultural change. ILFI organized our research and engagement around seven areas where buildings can have direct impact on their surrounding community:

- Contribution to Workforce Development and Local Businesses
- Enhancement of Open Spaces
- Inclusive Mobility
- Community Resilience + Revitalization
- Access to Local Food
- Community Engagement and Empowerment
- Education and Awareness Around Regenerative Design

This report aims to share tools, resources, best practices, and success stories to elevate the voices and opportunities for community-based organizations working in these arenas; identify opportunities to evolve and improve the rigor, impact, and access of LBC; and share resources to guide this important work of centering equity and community in the built environment. Through highlighting the expansive work happening in Pittsburgh, this project seeks to inspire local change and help communities beyond western Pennsylvania harness the wisdom of local communities and leverage Living Buildings to positively impact their economic, social, and cultural health—and ultimately, accelerate change toward a Living Future for all.

1 Pittsburgh's certified projects include: Frick Environmental Center (LBC 2.1), Phipps Center for Sustainable Landscapes (LBC 1.3), Nature Lab at Phipps (LBC 2.1 Petal), Phipps Exhibit Staging Center (LBC 3.0).

2 Pittsburgh's registered projects include: Hazelwood Community Land Trust Homes (LBC Core), Phipps Garden Center (Zero Energy Certification), Heartwood Annex (LBC Core), 216 North Ave. (Zero Energy Certification).

Participants

The success of this work was highly dependent on meaningful engagement with local stakeholders in Pittsburgh. To understand how regenerative buildings impact the local economic, social, and cultural health in their communities, it was necessary to work closely with stakeholders that have been deeply involved in the design, development, operations, and use of buildings certified under LBC. It was also important to engage with stakeholders in the community to understand the impact and benefit of regenerative design-related activities and programs run by community-based organizations in Pittsburgh.

ILFI engaged with two groups of stakeholders for this work: 1) operators, project teams, and building occupants affiliated with LBC projects, identified in this Report as *Certified Building* participants; and 2) community-based organizations in Pittsburgh, identified in this report as *Community Organization* participants. All stakeholders were invited to at least one informational interview. Additionally, Certified Building participants were asked to distribute a survey to building occupants to help understand the impact of these buildings in the community.

Certified Building Participants

Certified Building participants were selected to represent projects in Pittsburgh that have either achieved an ILFI building certification or are registered and actively pursuing certification. These participants have a thorough knowledge of the project throughout each building's life cycle from pre- to post-occupancy. Participants include architects, building staff, and building

users who are specifically connected to each respective project through direct employment, contractual work, or ownership.

FRICK ENVIRONMENTAL CENTER

HAZELWOOD COMMUNITY LAND TRUST HOMES

The following Certified Building participants contributed to this report by giving interviews, providing building data and metrics, and facilitating a survey of building occupants (where fully occupied):

- Frick Environmental Center (FEC) is a Living Building dedicated to experiential environmental education. Certified under LBC 2.1 in 2016, the FEC exemplifies equity, hands-on learning, and public engagement. The three-story building is nestled into an existing slope and sheltered by a simple roof resting on slender columns. The service barn and outdoor amphitheater, as well as the gatehouses and fountain, complete the site. As the main classroom for Pittsburgh Parks Conservancy's (Parks Conservancy) educational programming, the building and surrounding site act as ecosystems for both immersive outdoor education and hands-on lessons in sustainability. The FEC is a joint venture between the City of Pittsburgh and the Parks Conservancy and demonstrates the latter's mission to restore the City's deteriorating parks and reestablish a cycle of stewardship. Learn more here.
- Hazelwood Community Land Trust Homes (Hazelwood) is a 25,000 square foot, 12-home affordable housing project in Pittsburgh, pursuing LBC Core. Construction of the first four homes is expected to be completed by the end of summer 2024. The Hazelwood neighborhood has been impacted by vacancies after years of disinvestment, and the City of Bridges Community Land Trust is working to get ahead of recent tech company interests that are spurring speculation in the community. The developer is working with architect Rothschild Doyno Collaborative on this project to tackle the affordable housing challenge holistically by addressing the urgent demand for affordable, resilient housing and ensuring that the housing supports the health and well-being of residents, keeps purchase and

operating costs affordable, and manages construction impact on the community. A notable feature of the project is the use of modular construction which helps achieve goals in a way that may provide a template for other affordable housing projects in the region. Learn more here.

PHIPPS CENTER FOR SUSTAINABLE LANDSCAPES. PHOTO CREDIT: DENMARSH PHOTOGRAPHY.

NAME	PROJECT	TITLE	REPRESENTING
James Brown	Frick	Director of Education and Frick Environmental Center	Pittsburgh Parks Conservancy
Ellen Conrad	Frick	Naturalist-Educator	Pittsburgh Parks Conservancy
Anonymous Building Occupants	Frick	Varies	Surveyed Certified Buildings Participants
Michael Gwin	Hazelwood	Principal	Rothschild Doyno Collaborative
Bryan Thompson	Hazelwood	Associate	Rothschild Doyno Collaborative

This report includes findings from ILFI's independent research on the following projects, but they were not able to engage in the full Certified Building participant interview and survey process:

- Phipps Conservatory and Botanical Gardens (Phipps) has a mission to inspire and educate all with the beauty and importance of plants, advance sustainability and human and environmental well-being through action and research, and celebrate its historic glass houses. Visitors to Phipps will experience industry-leading sustainable architecture and regenerative building practices in addition to their gardens, flower shows, and commissioned exhibits. Phipps has lived up to this mission by certifying multiple projects with ILFI, with more on the way:[3]

3 In addition to the buildings listed here, Phipps is pursuing LBC certification for the Phipps Garden Center.

- Center for Sustainable Landscapes (CSL) is located on a restored brownfield that has been transformed into a productive site and renovated building that takes what it needs from resources available on site and provides a healthy environment for life to thrive. True to the Phipps mission, the ongoing work at the CSL is based on recognizing vital and positive connections between people, plants, beauty, and health, and focuses on awakening children to nature and encouraging sustainable, healthy lifestyles. The CSL generates all of its energy and treats all storm and sanitary water captured on site. It is the first and only building to meet seven of the highest green certifications, including achieving LBC 1.3 certification in 2015.
  Learn more here.
- Nature Lab at Phipps (Nature Lab) is one of the nation's first sustainable, modular classroom spaces. Designed to serve a dual purpose as a learning laboratory and an innovative, replicable model for healthy learning spaces, the Nature Lab features nontoxic materials, generates its own energy, and recycles water on site. The Nature Lab achieved LBC 2.1 Petal certification in 2017. Learn more here.
- Exhibit Staging Center (ESC) is a former public works building with the typical features of an 1960s industrial facility: block wall masonry, a flat roof, and no windows. In 2019, Phipps adapted this structure into the ESC with a dynamic, modernized design and the ambitious goal of achieving three of the world's most rigorous building standards, including Living certification, which it achieved in 2023 under LBC 3.0. Learn more here.

ACTIVE LEARNING AT THE PHIPPS NATURE LAB. PHOTO COURTESY OF BANKO MEDIA, INC.

Community Organization Participants

Community Organization participants were selected based on the alignment of their mission and programs with the identified impact areas. The following community-based organizations contributed to this report by sharing documents and participating in informational interviews:

- **BikePGH** is committed to advancing car-free transportation options as a means to improve the quality of life of Pittsburgh's residents. The nonprofit organization strives to increase awareness and expand bicycle and pedestrian infrastructure in the city, and they pursue this mission through their three program areas: Advocacy, Education, and Community. Their work includes successfully advocating for on-street bikeways, hosting education programs for both youth and adults, and organizing annual community events such as OpenStreetsPGH and PedalPGH. Learn more here.

- **Grounded Strategies** supports neighborhood revitalization efforts in Pittsburgh by empowering underserved communities to reclaim and activate vacant or underutilized land. With vacant land stewardship at the center of their work, the organization equips residents with the tools, education, and resources needed to transform their neighborhoods from within and participate in public engagement processes as they relate to development in their communities. Learn more here.

- **Grow Pittsburgh** is a social justice organization with a mission to increase food access through three key program areas focused on urban agriculture: Community Projects, School Gardens, and Food Production. The organization supports the establishment of food gardens at the community level through capacity building, technical assistance, education, and financial support and also operates several urban farm sites that directly distribute healthy, affordable food to communities affected by food apartheid.[4] Learn more here.

- **Monmade** works to expand and diversify the local economy in Pittsburgh by cultivating a network of small artisanal maker businesses and supporting a market for regionally-sourced, sustainably-made products for the built environment. By acting as a conduit between small creative businesses and the building industry, Monmade empowers artisanal makers and small manufacturers to elevate their work, scale their businesses, and participate in transformative collaborations such as the Hazelwood Community Land Trust Homes. Learn more here.

4 In recent years, advocates have used the term "food apartheid" in place of "food deserts" to reflect the systemic racial and economic inequities that create disparities in food access. Learn more about this topic and the state of food access in Pittsburgh in the FeedPGH: Understanding Food Insecurity in the City of Pittsburgh report.

- **New Sun Rising (NSR)** is a community economic development intermediary that collaborates with communities, nonprofit organizations, and social enterprises to build capacity, develop data-informed solutions, and improve access to funding. NSR's work is rooted in the Vibrant Communities Framework, a tool for taking community-driven action through three distinct development stages. The framework applies a triple bottom line approach to development that is premised on the assumption that vibrant communities exist at the intersection of culture, sustainability, and opportunity. Learn more here.

- **Riverlife** is a nonprofit organization dedicated to the improvement and activation of Pittsburgh's downtown riverfronts through waterfront parks, public trails, greenways, and other recreational amenities. Recognizing riverfronts as the heart of Pittsburgh's open space and civic infrastructure, Riverlife works with land owners, developers, community groups, and local officials to implement its comprehensive vision for creating a cohesive riverfront experience for Pittsburgh residents. Learn more here.

- **Shiftworks Community + Public Arts (Shiftworks)** lies at the intersection of public art and community engagement and envisions artists as agents of social, civic, and cultural change. With the goal of building capacity for collaboration between artists and communities in the co-creation of civically engaged public art, Shiftworks supports artist development through temporary public art, residencies, and civic engagement projects as well as a range of public programming and client projects. Learn more here.

- **Triboro Ecodistrict** represents the coordinated efforts of three Allegheny County boroughs working toward a sustainable community development framework organized around six focus areas: Equity, Food, Water, Energy, Air Quality, and Mobility. This collaboration between the boroughs of Millvale, Etna, and Sharpsburg was established to scale impact by sharing resources and knowledge as each borough pursued EcoDistricts Certification (now known as Just Communities Certification). Learn more here.

NAME	ORGANIZATION	TITLE
Scott Bricker	BikePGH	Executive Director
Darnell Moses	Grounded Strategies	Interim Executive Director, Board Member
Kelly Henderson	Grounded Strategies	Executive Director
Dora Walmsley	Grow Pittsburgh	Director of Community Projects
Katie Schaible	Monmade	Director
Jamie Johnson	New Sun Rising	Director of Programs
Scott Wolovich	New Sun Rising	Executive Director
Gavin White	Riverlife	Director of Planning and Projects
Sallyann Kluz	Shiftworks	Executive Director
Brian Wolovich	Triboro Ecodistrict	Cofounder, Millvale Advisory Board Member

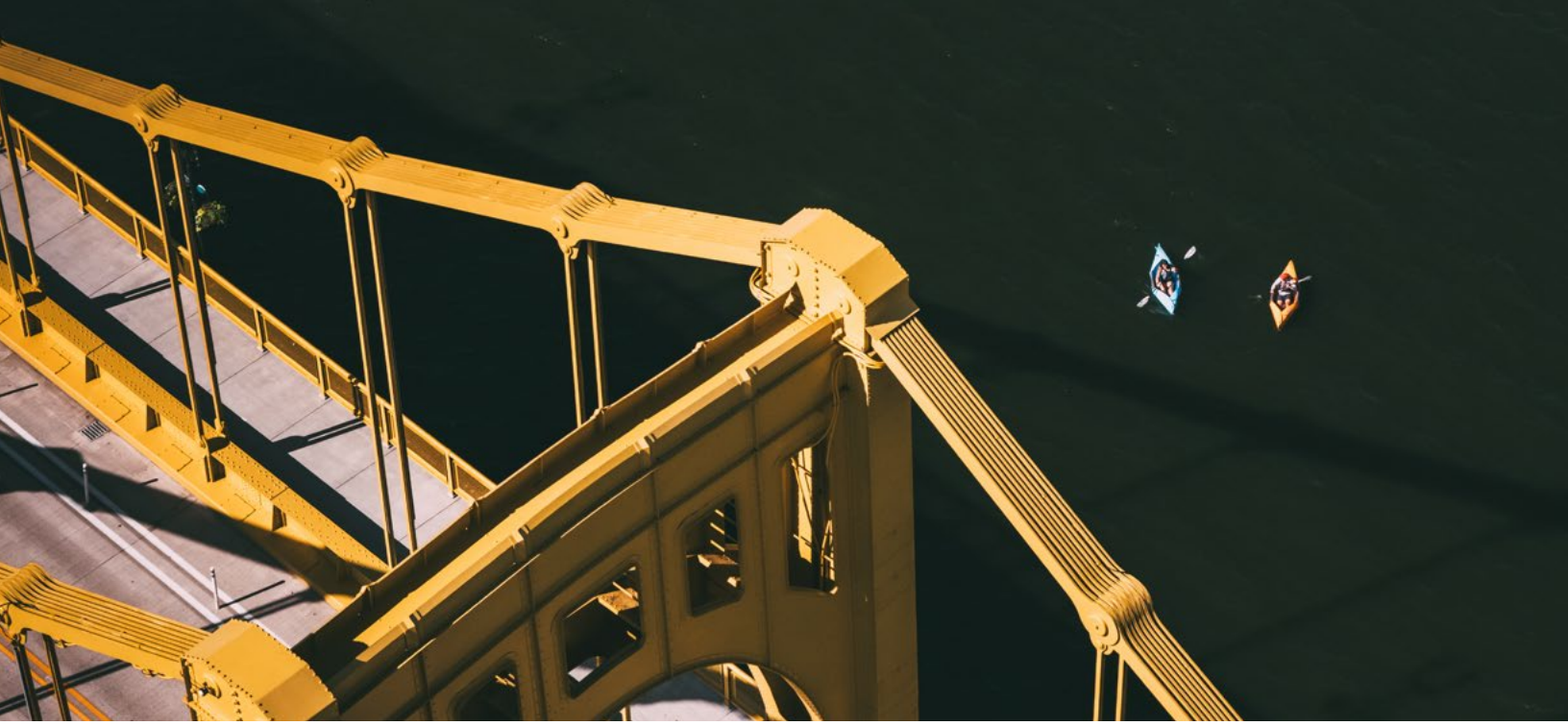


IMAGE COURTESY OF RIVERLIFE

Methods

Research and Engagement

ILFI employed a variety of tactics to learn about the experiences of Pittsburgh's regenerative building community and community-based organizations.

Certified Buildings

After identifying Certified Building participants, ILFI conducted internet research and document review to learn more about each project. Sources of information included organization webpages, local events webpages, ILFI Trim Tab articles, project case studies, published reports featuring the building, and project team submissions to ILFI for certification.[5]

ILFI then conducted outreach to representatives of each project to request and schedule informational interviews. The objectives of these interviews were to gain an understanding of the following:

- The extent and nature of the community response to the facilities, services, or actions undertaken during the planning, construction, and initial operation of the building to comply with LBC requirements.
- What, if any, other strategies employed as part of the building project resulted in lasting positive impacts within the community.

5 Reviewed documentation included the strategies implemented by certified buildings as well as post-occupancy evaluations.

- What, if anything, the project owner/operator would do differently to better serve the community.
- What suggestions the project owner/operator has for modifying LBC requirements to achieve greater community impact and engagement.
- What quantitative data has been collected, how, and why.

During each interview, ILFI took detailed notes, which were then shared back with the interviewee for a review of accuracy and to invite feedback or follow-up.

Additionally, ILFI provided the Certified Building participants with a survey for building occupants (i.e., frequent users of the building such as employees or maintenance staff) to gather information on the respective building's positive impact from the perspective of occupants with a day-to-day presence in the building.

Community Organizations

To identify potential Community Organization participants, ILFI reviewed project files from existing Pittsburgh regenerative buildings, conducted internet research, and crowdsourced recommendations from ILFI staff and network contacts familiar with Pittsburgh. ILFI then determined which organizations to contact based on alignment with project goals, with the aim to engage with at least one community-based organization working within each of the seven impact areas.

The ILFI team reached out to the selected community-based organizations to introduce the project and request informational interviews to learn about their strategies for achieving and measuring positive economic, social, and cultural impacts in their local community. As interviews were confirmed, the team conducted further research to develop tailored interview questions for each organization based on the relevant impact areas. Using the same approach as with Certified Building participants, the ILFI team took detailed notes, which were then shared back with the interviewee for a review of accuracy and to invite feedback or follow-up.

Participant Compensation

As a token of appreciation for the time and contributions to this work, ILFI offered stipends to the following participants:

- Each Certified Building's lead organization for the informational interview and survey administration.
- Each Community Organization for the informational interview.
- Certified Building survey participants were entered into a gift card sweepstakes

FRICK ENVIRONMENTAL CENTER. PHOTO CREDIT: TAIJI NELSON.

Findings

The Findings section summarizes the results of ILFI's research to determine how buildings can positively impact the surrounding community. It is organized by the seven impact areas, with each area structured with the following headers and subheaders:

- Certified Buildings: introduction, relevant findings, and conclusions;
- Community Organizations: introduction, relevant findings, and conclusions focused on how the findings apply to the building industry; and
- Guidance and Example Strategies for the Building Industry: recommendations for how buildings can increase and enhance positive economic, social, and cultural impacts and examples strategies employed by the Certified Buildings and/or Community Organization participants.

While overlap exists among the strategies captured within the impact areas (e.g., community engagement could be assessed across all impact areas), we have included findings in the most relevant impact area sections below. The final Conclusions section highlights high-level, cross-area takeaways that are applicable to all building projects across the industry.

IMAGE COURTESY OF MONMADE

1 | Contribution to Workforce Development and Local Businesses

From design and construction to operations and maintenance, buildings have the opportunity to create stable, safe, and high-paying job opportunities for people in the local community, and to support local, diverse businesses through hiring, purchasing, and workforce development practices.

Certified Buildings

Introduction

Contributions to the growth of local businesses and the workforce can provide short-term outcomes tied directly to building design and construction, but with continued intention, they can also yield longer term benefits through ongoing procurement and contracting that support building program and operation, as well as through programming and other initiatives.

Findings

IMPACT ON BUILDING OCCUPANTS

At the Frick Environmental Center (FEC), 83% of building occupants surveyed indicated that they were aware of ongoing efforts of the building owner to support local and minority-owned or disadvantaged businesses. In addition, all of those respondents indicated that the building owner's efforts had inspired them to seek out local and minority-owned or disadvantaged businesses or to recommend them to others in their personal lives.

IMPACT ON COMMUNITY

Specific hiring data from Hazelwood showed that LBC certification requirements aligned with municipal requirements resulting in 34% of subcontracts going to six minority, women, and disadvantaged business enterprises (MWDBEs), five of which were minority business enterprises. In addition, preliminary materials data for Hazelwood show that nine different products were sourced directly from Pittsburgh artisans and that a significant portion of large-volume products (including the modular building structure, drywall, insulation, and windows, spanning a further five construction specification categories) were supplied from within western Pennsylvania and eastern Ohio. This includes working with a local contractor to engage a modular fabricator in western Pennsylvania to build out the buildings' structure, envelope, and major finishes.

Elements sourced directly from Pittsburgh craftspeople included custom detail elements such as interior and exterior screens, house numbers, lighting, mailboxes, tile, door and cabinet pulls, and planters. Four of these local artisans were participants in Monmade's Green Leap program that provides support to local makers to bring new sustainable products to market. In addition, several metal-, glass-, and wood-workers that created pieces for the homes are from the Hazelwood neighborhood itself.

At FEC, both programming and owner policy directly support local and disadvantaged businesses. In one example, local Black chefs will be featured in a fall harvest celebration at the From Slavery to Freedom Garden which will be free and open to the public and demonstrate creative ways to prepare traditional crops.

With a focus on promoting artists, Phipps developed the BETA (Biophilia Enhanced Through Art) Project in tandem with construction of its Center for Sustainable Landscapes (CSL). BETA is an art exhibit staged throughout the building and surrounding landscape of the CSL. In a collaboration that both brought in local art experts as well as featuring mostly local artists, the

ARTIST INSTALLING WORK AT THE PHIPPS CENTER FOR SUSTAINABLE LANDSCAPES. PHIPPS CONSERVATORY AND BOTANICAL GARDENS.

BETA Project was intended to add a new dimension of sensory engagement to the CSL through nature-influenced art that reflects the CSL's western Pennsylvania locality.

With respect to workforce development and job training, specific related requirements within LBC did not exist until after the time of Hazelwood's registration. Despite this, youth training programs, often focused on underserved populations, were a feature of either project construction or ongoing programming not only for the Hazelwood homes, but also at the FEC and Phipps Nature Lab:

- The Pittsburgh Parks Conservancy operates three different internship/externship programs primarily based out of the FEC that are focused on environmental education and sustainability, horticulture, and forestry. For example, a high school summer program provides in-depth hands-on experience doing park stewardship projects and exposure to a wide range of careers in ecology, conservation, and sustainability. These programs also include partnerships with local workforce development groups such as Landforce and the Student Conservation Association.
- The Phipps Nature Lab hosts Learning for a Greener Future, a paid summer internship program for high school students from under-resourced communities, in which participants are exposed to diverse aspects of sustainability through work with Phipps' skilled science education and horticulture staff, college interns and volunteers, and experts from Pittsburgh's environmental community. To gain practical experience combining technical knowledge and communication, upon graduation, they have the opportunity to lead the public sustainability tours of Phipps' certified buildings.
- Located in Hazelwood, the Industrial Arts Workshop is a hands-on training program offered to teens from under-resourced neighborhoods to develop skills in design, fabrication, and installation. The streetside bike racks for Hazelwood homes were made by students in this program.

Conclusions

While LBC requirements incorporating workforce development were not yet in place when most of the evaluated projects were certified, each project found a way to integrate job training into the project either during construction or as an ongoing part of project programming. Some tapped into external programs while others created new opportunities for internal programs already in place. The review of these projects suggests that there are a variety of ways to support workforce training and that it is a worthwhile focus for LBC.

Requirements aimed at elevating local businesses that are typically less-resourced can have demonstrative impact. While not necessarily motivated by individual buildings, organizational policies prioritizing support of local and MWDBE businesses may be implemented and reinforced at the building level. These policies can not only accrue benefits to those types of businesses but also motivate building occupants to seek them out in their personal lives.

Community Organizations

Introduction

Of the Community Organization participants, both New Sun Rising (NSR) and Monmade consider business incubation and growth as integral to their mission. Both organizations' work centers around capacity building for small businesses and social enterprises, emphasizing the vital role this plays in community development. In a similar vein, many of the community-based organizations interviewed have a workforce development component represented in their programs.

NSR'S VIBRANT COMMUNITIES FRAMEWORK

Findings

BUSINESS INCUBATORS AND ACCELERATORS

NSR was established to fill in the gaps around incubator support for social enterprises and mission-driven projects that sit within the intersection of nonprofit and for-profit work. The organization developed the Vibrant Communities Framework, a place-based incubator model designed to support local stakeholders to lead and benefit from change—challenging traditional venture capital-based incubator models which were often observed to be predictors of gentrification, displacement, and wealth inequality.

NSR acknowledges that due to the complex nature of ecosystems, many of the impacts of their work are indirect and are a result of the contribution of many different organizations and stakeholders. Nevertheless, the organization tracks the following impacts:

- Number of businesses or nonprofits launched and strengthened;
- Social, environmental, and economic impact of businesses and nonprofits;
- Number of people engaged to improve quality of life outcomes;
- Number of community development initiatives supported (e.g., Launch Millvale, Launch Hilltop, Launch Sto-Rox, and Launch Wilkinsburg);
- Grants, funding, and financing accessed through NSR support; and
- Buildings redeveloped as physical business incubation and community resource spaces (e.g., Millvale Food + Energy Hub).

Through its business accelerator programs, Monmade builds the capacity of small creative businesses and expands their access to broader markets with a focus on the building industry. According to Monmade, the primary economic impact of this work is the monetary compensation going directly to the artisanal makers, which helps ensure the ongoing sustainability of their businesses. Indirect impacts include investment in the local communities where the makers work—which, in Monmade's experience, are typically found in Pittsburgh's underserved neighborhoods. One illustration of this is the number of studio or manufacturing spaces leased and activated by local makers, which otherwise would be empty storefronts in disadvantaged neighborhoods.

A notable impact of Monmade's Green Leap program is improvements to makers' design and production processes that resulted from meaningfully engaging with the following environmental and equity-related considerations:

- Environment (sustainable materials and production);
- Social Equity;
- Climate;
- Circular Economy;
- Human Health; and
- Eco-Labels.

Green Leap participants attended education sessions with sustainability experts to identify opportunities to incorporate these considerations into their products. In addition to sustainability outcomes created throughout the product life cycle, Green Leap has also equipped makers with valuable knowledge that can be leveraged to both grow their businesses and add value to built environment projects.

Both Monmade and NSR cite that the effectiveness of their programs lies in their recognition that businesses and communities undergo distinct development stages with different needs and levels of capacity. For example, Monmade tailors their First Leap, Next Leap,[6] and Green Leap programs to respond to different business growth stages, and NSR's Vibrant Communities Framework is organized into three phases: Ignite, Launch, and Grow.

RESIDENCY AND TRAINING

Shiftworks recognizes artists as small businesses and economic engines that support the local economy in which they create art. Like Monmade, Shiftworks believes that one of the most significant economic impacts of their work (and public art in general) is the equitable wage practices and financial support directly received by artists, which in turn creates positive outcomes for their local communities:

> *[W]hen you invest $250,000 in a public art project with an artist in your region, you've basically hired an artist for two years. You've created a full-time job there. You are then paying a series of fabricators, contractors, engineers – all of that money is going into the local economy.*
>
> **SALLYANN KLUZ, SHIFTWORKS**

To scale impact, workforce development initiatives are embedded in the programs of a number of Community Organization participants:

- Shiftworks: artist development through the Pittsburgh Creative Corps initiative and other project commissions;
- NSR (in partnership with Triboro Ecodistrict): Solar Workforce + Education Program;
- Grounded Strategies: land stewardship training through the CommunityCare program; and
- Grow Pittsburgh: Urban Farmers in Training and Pre-Apprenticeship programs.

6 First Leap and Next Leap are programs run by Bridgeway Capital, Monmade's parent organization.

Conclusions: Applicability to Buildings

Several community-based organizations emphasized the importance of meaningfully involving small local businesses in every built environment project. In addition to ensuring that the economic benefits of the project are also experienced by the local community, this also plays a role in strengthening long-term community resilience. Reflecting on the devastating flooding experienced by his community in 2004 and 2007, Brian Wolovich of Triboro Ecodistrict shared his thoughts on prioritizing locally-owned small businesses during redevelopment efforts:

> *We said, we have two women that run pharmacies in our neighborhood that are second and third generation in their families to run these pharmacies, and they take care of our neighbors when we need them. They are not going to leave because of a flood. Why would we displace our local economy for a corporation that may or may not stick around?*
>
> **BRIAN WOLOVICH, TRIBORO ECODISTRICT**

To increase support for locally-owned small businesses in built environment initiatives, Monmade points to focusing efforts on direct and early outreach to decision-makers (i.e., developers and owners). In their experience, while architects and designers are excellent allies, success lies largely in having upfront conversations with building owners at the beginning of the project to define the project's vision and highlight how involving small maker businesses will reinforce this vision. This not only ensures that this vision is budgeted for from the start but also creates a compelling story that adds value to the building project as a whole.

FABRICATION OF ABOVE STAGE BY ARTIST TIM ENGELHARDT, 2024; PHOTO BY ISHARA HENRY, COURTESY SHIFTWORKS

Guidance and Example Strategies for the Building Industry

- Consider expanded incentives for building projects that support the incubation or growth of locally-owned small businesses through, for example, providing physical spaces for business incubation (e.g., tenant agreements, capacity building, or training spaces for small business acceleration) or programmatic offerings (e.g., workforce development programs tied to the building's regenerative systems).
- Include specific objectives in project goals for hiring local and disadvantaged businesses and contracting with job training programs.
- To achieve goals related to workforce development and local and disadvantaged businesses, teams should consider the following recommendations, which include example strategies implemented by the Certified Building participants.
    - Connect with community job training programs:
        - The Hazelwood community Industrial Arts Workshop provided hands-on training to local youths who made the bike racks for the project.
    - Tap into the local fabricator, maker, and incubator communities:
        - A modular fabricator in the region working with a local contractor helped achieve a number of sustainability and cost goals for Hazelwood.
        - Craftspeople working in Pittsburgh, including some located right in the project neighborhood, provided a wide variety of custom products for Hazelwood homes.
        - A local maker incubator, Monmade, connected Hazelwood to local craftspeople, including those working to create new sustainable products.
    - Use ongoing programming as an opportunity:
        - Parks Conservancy policy supports preferring local and traditionally disadvantaged businesses when programmatic and operational needs at the FEC require vendors, materials, and contracts.
        - The Parks Conservancy uses the FEC as the base for three different internship/externship programs.
        - Phipps Nature Lab hosts a paid summer internship program for under-resourced communities that uses all of the certified buildings to further education and training.
        - When the CSL first opened, Phipps used it for the creation of a mission-aligned art display that features predominantly local artists.

CAMPERS RELAXING AROUND THE FOUNTAIN AT THE FRICK ENVIRONMENTAL CENTER. PHOTO CREDIT: ED MASSERY.

2 | Enhancement of Open Spaces

Through both design and operations, opportunities abound for buildings to serve as a catalyst to help recognize and celebrate cultural richness while ensuring equitable access to fresh air, sunlight, and clean water and soil. Healthy spaces allow all species to thrive by connecting people to each other and the beauty found in art and nature, which serves as a precursor to caring enough to preserve and conserve their surroundings for the greater good.

Certified Buildings

Introduction

Within LBC, expectations for open spaces, gathering places, and public art differ between residential and nonresidential buildings, with residential requirements emphasizing a connection to nature and providing native habitat functions over the more public-oriented gathering and art objectives. Just one of the projects surveyed is residential; the others are not only designed specifically to welcome the public but were built for the express purpose of facilitating people's enjoyment and understanding of the surrounding open spaces and natural landscapes—an alignment of function that helps further the impact of these buildings.

Findings

IMPACT ON OCCUPANTS

At the Frick Environmental Center (FEC), two thirds of survey respondents indicated that the open space, gathering places, and public art provided by the building had inspired them to either more frequently use similar places in their free time or to advocate for more of them in their own communities

In a post-occupancy survey of the occupants of the Phipps Exhibit Staging Center (ESC), all respondents reported that the building design made them feel either somewhat or completely connected to nature, with the majority feeling a complete connection. In addition, over 90% said that the design made them feel connected to the local region.

> *On foggy mornings as I walk through the stone gate houses, I'm struck by how special it is to work in a building that inspires me to do what I love. The Center lets me feel both immersed in nature and aware of the subtle changes in the park throughout the day. It's a building that is intimately connected to the place where it exists.*
>
> EMPLOYEE, FRICK ENVIRONMENTAL CENTER

IMPACT ON COMMUNITY

All researched projects restored degraded—and in some cases asphalt-covered—landscapes to native plant communities. At Phipps, the site surrounding the certified buildings comprises 4,200 square feet of restored green space, with plantings consisting of native grasses, perennials, shrubs, and trees representative of the temperate broadleaf and mixed mesophytic forests of the Western Pennsylvania Appalachian Ecoregion. At the FEC, extensive native plantings improved meadow, woodlands, and wetlands habitats, and the flow of stormwater is intentionally managed to restore the wetland hydrology. At both the FEC and Phipps sites, connections to adjacent natural areas were also established via trails for humans and habitat corridors for nonhumans. Not only did these projects result in restoration of extensive areas of native habitats but they also greatly improved use of the sites.

Instead of planting turf grass at the Hazelwood site, which supports duplex or quadplex townhomes in what was a blighted infill area, a swale planted with native species facilitates stormwater drainage. Small side yards and backyards are also planted with native species. In addition, modular construction minimized site disturbance outside of the building footprint, allowing existing vegetated slopes behind the homes to be left untouched.

Also worth mentioning is that the FEC has just broken ground on a new outdoor space for development of a sensory garden, which continues its commitment to accessibility and inclusivity. Staff reported that the planning and design process for the sensory garden had prompted them to reexamine the degree of accessibility of other parts of the site, further extending the positive impact.

With respect to connecting people to nature from inside a building, one otherwise successful effort has had an unintended negative consequence: the large windows providing a dramatic view of the adjacent woodland at the FEC have resulted in frequent bird strikes. While mitigation efforts have helped, it remains a problem.

In terms of creating welcoming places for people to gather, both the FEC and Phipps projects established a variety of different spaces that are well used by both the occupants and members of the surrounding community. For example, the indoor Living Room at the FEC, which offers seating, toys, and free Wi-Fi, is very well-used on an informal basis, especially by families visiting the park. The Exhibit Staging Center (ESC) at Phipps has an outdoor space used for exercise, meeting, and lunching, while the boardwalk and benches along the stormwater treatment lagoon provide a place for visitors to both relax and explore. Similarly, seating provided around a fountain and adjacent benches at the FEC get a lot of use, as does an amphitheater that doubles as a staging and gathering area before and after structured events. Staff noted, however, that the amphitheater could also function well as an informal place for relaxing or play if it had better shade.

Public art is another prominent feature at both the FEC and certified Phipps buildings; however, the art is well-integrated into the natural setting and building functions, making it challenging to tease apart specific impacts.

Conclusions

The projects sited with an explicit intent to provide education and connection to nature have been very successful in creating enjoyable open spaces. Even in the residential site with a small lot, there are native plantings and an adjacent green space.

In addition, projects have been successful at making an indoor/outdoor connection to nature through the use of tall windows that look onto woodlands and other green spaces. However, in at least one building, this success has come with the downside of creating a strike hazard for birds. ILFI has heard this from projects in other regions as well and not just for projects in parks with floor-to-ceiling windows.

A place that people will linger in and enjoy does not necessarily need to have elaborate features and can take a variety of forms depending on the setting. Providing a sense of safety and comfort are essential; beyond that, it can be sheltered or out in the open, quiet or full of activity, and offer a service or just a place to relax. The possibilities are many, and thinking about how the space can augment the building's function and its connection to the community can be an effective starting point.

Community Organizations

Introduction

The enhancement of open spaces creates myriad community benefits, many of which intersect with the work of different community-based organizations. While open space activation is a direct goal of one Riverlife's work, it also plays a vital role in neighborhood revitalization, food access, mobility, and community engagement. Community Organization participants described

strategies for the enhancement of open spaces, emphasizing their role as valuable third places with the potential to cultivate belonging and maintain a sense of community.

Findings

Riverlife has established a clear link between open space and park infrastructure investment and positive economic outcomes for the local community. Through an economic impact analysis conducted in 2015, the organization identified a 60% increase in value for Pittsburgh properties adjacent to riverfront investment projects since 2001, compared to a 32% increase elsewhere in the city. The same study also examined riverfront development activity catalyzed by open space and park investment, which revealed a ratio of 20:1.

The organization also measures noneconomic community impacts using a detailed scorecard system for each downtown riverfront segment. The scorecard is used to identify priority areas and inform future interventions based on five metrics:[7]

1. Connectivity: quality, frequency, and type of access to the river, trails, bridges and neighborhoods;
2. Place: quality, frequency, and type of uses, amenities and destinations;
3. Ecology: plant community, riverbank conditions, and impervious surfaces;
4. Maintenance: state of maintenance of the trail; and
5. Experience: spatial structure and spatial character, including the scale and activities of the river segment.

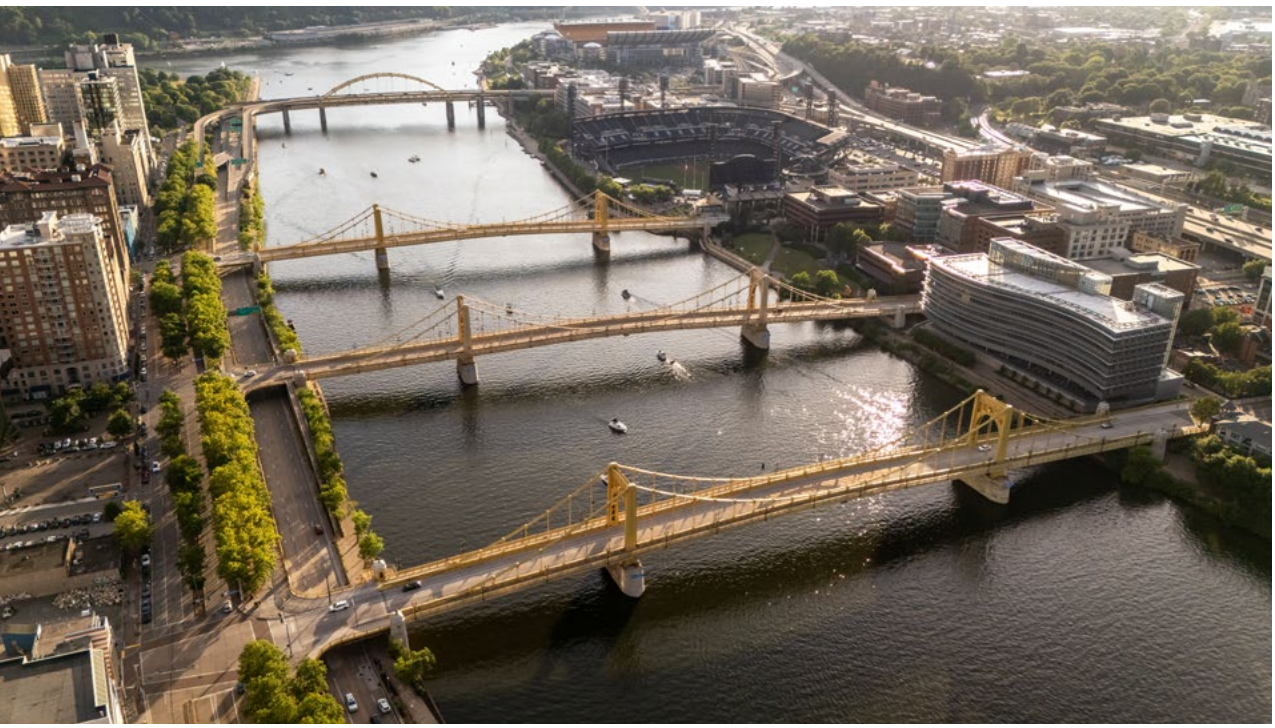
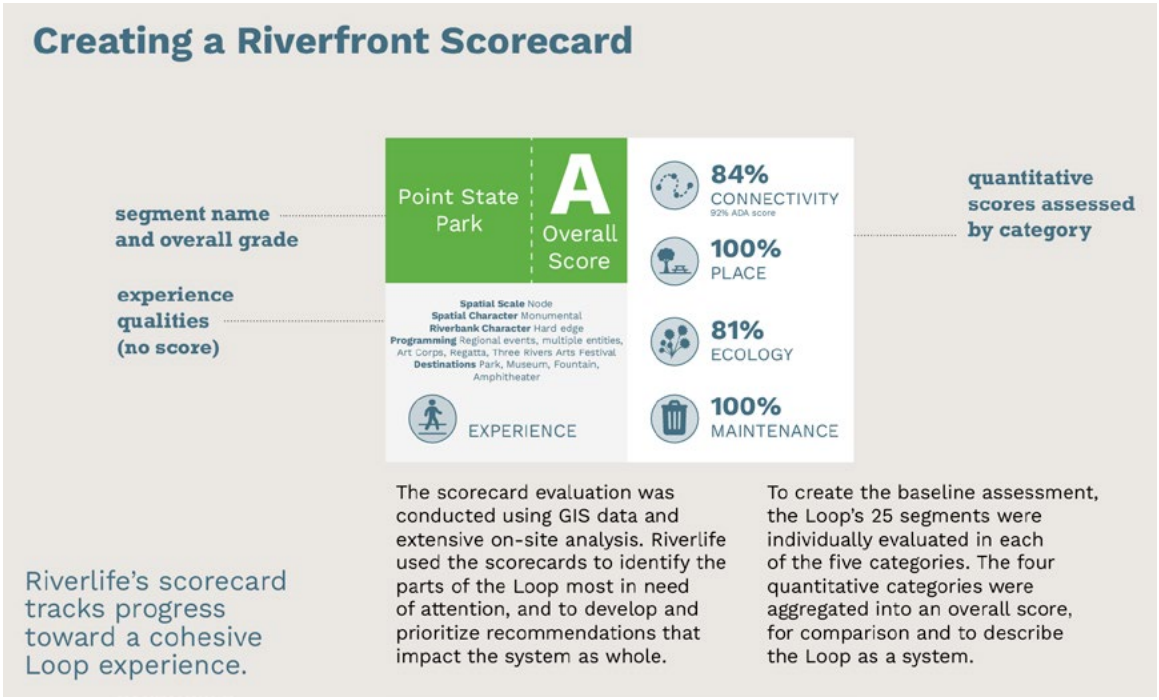


IMAGE COURTESY OF RIVERLIFE

7 Detailed descriptions of the scorecard metrics and resulting data are included in Riverlife's Completing the Loop report (pp. 22-29).

Furthermore, Riverlife is currently developing a survey that aims to measure sense of belonging and representation in riverfront open spaces.



RIVERLIFE'S RIVERFRONT SCORECARD, FROM THE ORGANIZATION'S COMPLETING THE LOOP REPORT (P.22)

In identifying features or amenities in open spaces that are most impactful for their communities, Community Organization participants shared the following:

- Basic amenities such as bathrooms, water fountains, and lights for safety;
- Pollinator gardens and food-growing spaces (e.g., the African Healing Garden);
- Play spaces; and
- Green infrastructure for stormwater control.

Public art was consistently cited in interviews as a particularly impactful element of open spaces; while it is a relatively inexpensive investment, it provides an excellent opportunity to represent and celebrate the community's local identity, history, and culture. Public art can also be an instrument for highlighting a local environmental justice issue or advocacy, as illustrated by Grounded Strategies's AirSpace Braddock project, which celebrates clean energy sources as a way to improve air quality, and Shiftworks's Environment, Health, and Public Art Initiative, which addresses community concerns around water pollution, air pollution, and soil lead toxicity. This connection is central to Shiftworks' mission—in the organization's work, public art is centered as a catalyst for social, civic, and cultural change, and community members are seen as highly valued collaborators in its creation.[8]

8 This is discussed in more detail in Community Engagement and Empowerment.

Conclusions: Applicability to Buildings

Connectivity is a priority determinant in Riverlife's work, and this can also apply to open spaces in building projects. According to the organization, project teams should go beyond thinking about open space within the project boundary and instead examine it as part of a larger system consisting of the broader streetscape, park system, or ecosystem. With this mindset, each development should align with and be a contributing part of that ecosystem and the benefits it provides.

In incorporating public art in built environment projects, both Riverlife and Shiftworks shared positive experiences around involving artists early on in the project design process. This can create opportunities for innovation that result in more cohesive solutions for a smaller budget, scaling impact beyond what can be achieved by merely hiring an artist to do a single piece. In Riverlife's West End Bridge project, for example, artists were included in the design team from the beginning of the project. Shiftworks also demonstrates this in their project with artist Natalie Settles; instead of creating an art piece added to the building after construction, the artist designed window etchings that were fabricated by the glazing contractor, making the process much more efficient and cost-effective.

NATALIE SETTLES, ELDER, 2017, PHOTO CREDIT: TOM LITTLE.

Guidance and Example Strategies for the Building Industry

- Open spaces in building projects should be examined to emphasize connections not only to surrounding natural areas but also to other types of open spaces, gathering spaces, and the streetscape. Project teams should adopt an ecosystem mindset and consider how the project can connect with and contribute to larger systems of open space beyond the project boundary.
- Explore opportunities for innovation as it relates to project team roles or design processes (e.g., involving artists early in the design process to create more innovative outcomes).
- The building industry, with support from organizations such as ILFI, should develop strategies and healthy materials that provide for outside views and a connection to nature in ways that do not cause harm to birds.
- To achieve goals related to enhancement of open spaces, design teams should consider the following recommendations, which include example strategies implemented by the Certified Building participants.
    - Re-establish native plantings on blighted, neglected sites:
        - The Phipps project site was completely replanted with species representing the native complex of habitats of the region.
        - At the FEC, extensive native plantings and stormwater management restored the existing mix of on-site habitat types.
        - The Hazelwood site used native plantings in drainage swales and the surrounding yard.
    - Create spaces with multiple purposes:
        - The outdoor amphitheater at the FEC is used for specific programming but also as an informal gathering area before and after programs out in the park.
        - The From Slavery to Freedom Garden is designed to provide education about history, culture, and gardening but is also used by people just to relax.
        - At the FEC, a concrete water sculpture entitled “Rain Ravine” highlights the path of rainwater, excites curiosity, and is part of a visual expression of the path of water collection and stormwater treatment on the site. The sculpture gets the most interaction with young children and families when it is raining.
        - At Phipps, the lagoon that functions as part of the stormwater treatment system is planted on the margins with native wetlands species and also has a wide boardwalk with benches running the length of one side, which invites visitors to relax or stroll and engage their curiosity about the lagoon.
            - An outdoor yoga court and adjacent gathering space at the Phipps ESC provides

an area for personal or group use for meetings, fitness activities, and educational programming. A covered deck area provides a protected outdoor space for meetings or staff meals and breaks.

- A green roof at the Phipps Center for Sustainable Landscapes has trails inviting public access and includes an herb garden that is used in the on-site restaurant.

- Create a variety of types of spaces to gather or connect with nature in ways that are complementary to the building's function:
  - The Living Room at the FEC offers seating, toys, and free Wi-Fi.
  - Trails at Phipps and the FEC provide a way to connect with nature at a slow pace.
  - At the FEC, seating around a fountain and adjacent benches provides a place to relax and cool off.
  - The addition of a new sensory garden and trail at the FEC are designed to engage and heighten different senses.

SCULPTED RAIN CATCHMENT AT THE FEC. PHOTO CREDIT: RENEE ROSENSTEEL.

3 | Inclusive Mobility

The intentional design of buildings themselves as well as their surrounding sites can contribute toward the creation of safe, accessible, pedestrian-oriented communities. This not only enhances neighborhood walkability and encourages an overall sense of being safe, welcomed, and included in the community but also improves environmental health by reducing the use of fossil fuel-based vehicles.

Certified Buildings

Introduction

Inclusive mobility addresses how the evaluated buildings contributed to safe and sustainable access for all, whether traveling to or moving within the buildings themselves or getting around in the surrounding communities. Here too, expectations for building accessibility within LBC differ between residential buildings and buildings that are open to the public, but the affordable housing mission of the respective residential developer motivated a degree of accessibility for the homes that exceeds the requirements for LBC certification.

While inclusivity is a specific area of interest within this topic, it is also addressed under other impact areas where inclusive strategies, particularly those focused on underserved or underrepresented populations, were implemented.

Findings: Sustainable Transportation

IMPACT ON OCCUPANTS

At the Frick Environmental Center (FEC), about 20% of the regular staff reported that they use the indoor bicycle storage room. Similarly, about 20%-30% of surveyed staff also reported riding the bus, walking to the building, and using the showers; however, a third of respondents also indicated that they did not use any of the facilities intended to encourage sustainable transportation. In addition, none of the respondents indicated that the facilities had prompted them to increase their use of sustainable transportation generally.

IMPACT ON COMMUNITY

Three public bus routes serve the FEC, but the nearest stop is one third of a mile away, which poses a barrier for some populations. Other strategies to encourage sustainable transportation, such as the outdoor bike racks, get significant use by visitors.

At Phipps, a historic biking and running trailhead to the neighboring city park was reestablished, and connections were made to a new bike network that links adjacent neighborhoods. Phipps is also accessible by bus.

While the Hazelwood residential project is not yet occupied, it was intentionally sited within walking distance to public transportation and the main business street in Hazelwood. In addition, bike racks on the street encourage visitors to arrive by bicycle, and there is an electric vehicle (EV) charging station.

Findings: Walkability, Safety, Inclusivity, and Accessibility

IMPACT ON OCCUPANTS

Of the occupants surveyed at the FEC, all respondents indicated that the building layout and facilities felt welcoming to a wide range of identities, abilities, and life stages.

IMPACT ON COMMUNITY

Both the FEC and buildings at Phipps are ADA-compliant.[9] Specific accommodations include accessible woodland and garden trails, building elevators, and at the FEC, wheelchair accessible garden beds. The sensory garden under construction at the FEC (see Enhancement of Open Spaces) is a notable effort to improve the park experience for a wider range of abilities. Staff commented that this big undertaking might not have gained sufficient support without the investment already committed in making the FEC a Living Building and the desire to continue reflecting those values in the FEC's ongoing work.

9 It should be noted that the Phipps charges an entry fee; however, there is an annual free admission day, and a reported 1% of low-income visitors annually (approximately 5,000) take advantage of an 85% discount available to electronic benefit transfer card holders.

The FEC also has plans underway to increase accessibility by renovating a ground floor bathroom to include a changing table and enhanced wheelchair access. In addition, staff are currently sourcing a variety of assistive technologies, such as auditory enhancers and special birding scopes, to expand the experience of nature for people with diverse abilities. However, staff commented that other needed improvements are in the planning stages to make the building's programming fully accessible with better signage, interpretive information, and displays. Staff also described both indoor and outdoor gender-neutral bathrooms at the FEC as being well-used and particularly appreciated by nonbinary students.

As noted above, while proximity to bus routes is helpful to many, staff at the FEC observed that bringing stops right to building entrances would open access to a wider population.

It is worth noting that the FEC's efforts to be inclusive and intentionally engage traditionally underserved populations (reflected both in the building and in its programming) have contributed to the building's designation as a Regional Asset District, making it eligible for funds to support additional equity and inclusion efforts. Phipps is also a Regional Asset District.

The Hazelwood project addressed inclusivity on multiple levels. The homes are part of an affordable development in an area that has been underserved and experienced an extended period of disinvestment. In terms of physical accessibility, the first floors are fully accessible, including accessible turning radii, with no elevation change from the street. This development will also bring more activity to the area and improve the streetscape in a way that blends with the existing character of the neighborhood, all of which should improve walkability and the feeling of safety.

> *I like to use the terms radically inclusive and radically accessible in terms of both equity and accessibility and thinking about the campus as a whole.*
>
> JAMES BROWN, FRICK ENVIRONMENTAL CENTER

Conclusions

Siting and designing a project for optimal human-powered transportation as well as providing facilities to support biking and walking has multiple benefits to the community, including protecting the local environment, enhancing the scale and feel of a neighborhood, and fostering the physical health of community members. It also reduces accessibility barriers for some, though not necessarily for those who have limited mobility; walking one third of a mile to or from a bus stop is easy and pleasurable for some but may not be for those using a wheelchair, walker, or who have other mobility issues.

Community Organizations

Introduction

Transforming Pittsburgh's streets, buildings, and open spaces to better accommodate car-free transportation options is central to BikePGH's work. The organization shared information about how they approach this work, highlighting the role of mobility and sustainable transportation in creating a more livable city.

Findings

BikePGH was founded as a bicycle and pedestrian advocacy organization in 2002 at a time when Pittsburgh was still in the process of recovery from the decline and disinvestment it experienced during the latter part of the 20th century. The organization's mission to improve bicycling infrastructure and mobility was seen as a way to help address the city's issues by making it a more attractive place to live. Over the last 22 years, BikePGH has supported the creation of over 100 miles of on-street bike markings, protected bike lanes, and neighborways.

The organization pursues its mission through three program areas: Advocacy, Education, and Community. In addition to measuring the number of miles of bicycle and pedestrian infrastructure built, BikePGH tracks the following impact data:

- StreetLight Data: an online transportation and mobility analytics platform which provides data on pedestrian, bicycle, and vehicle movement;
- American Community Survey data on the percentage of residents choosing bicycling for their work commute;
- PENNDOT Crash Data to identify priority areas and measure the effectiveness of bicycle infrastructure and traffic calming interventions;
- Bicycle lanes, bicycle racks, and other safe streets infrastructure installed;
- Policy recommendations implemented;
- Individuals engaged (e.g., creation of hyper-local advocacy groups, attendance in community events, educational workshops, volunteers, and member community); and
- Storytelling and anecdotal data and feedback from the community.

Notably, BikePGH's work intersects with that of Riverlife in its shared goal of improving mobility along Pittsburgh's riverfront trails and parks.

Conclusions: Applicability to Buildings

According to BikePGH, location is the most crucial element for advancing sustainable transportation in building projects. Like Riverlife, BikePGH views connectivity as a vital first step in improving mobility and encourages building projects to examine the building in the context of the broader bicycling, pedestrian, or public transit network:

> *Being very intentional about where buildings are built is super important. Is it connected with transit? Is it connected to a sidewalk network, or is it in a green field that you can only get to by car? So, that's number one. . . First and foremost, is it already a walkable neighborhood [where] people can combine trips? Is there a daycare center? Is there a health care center? Is there a grocery store? Is there a bakery? Is there a corner store? Are there all the things that one needs within walking distance?*
>
> SCOTT BRICKER, BIKEPGH

This emphasis on access to neighborhood amenities underscores the importance of advocacy around progressive zoning policy changes, including eliminating restrictions on mixed-use developments, removing mandatory minimum vehicle parking requirements, and allowing increased density in transit-adjacent, walkable neighborhoods. BikePGH points to this as a key strategy to achieving significantly greater positive impacts over time.

Finally, BikePGH encourages building projects to consider public investment in bicycle and pedestrian infrastructure beyond the project boundary. Depending on the needs of the local neighborhood, this could look like working with the local authority to invest in a bikeway that extends beyond the project site, contributing to improvements in the larger bicycle network.

PHOTO CREDIT: BIKEPGH

Guidance and Example Strategies for the Building Industry

- Project teams should establish discrete design objectives for both accessibility, which is typically thought of as addressing diverse physical and neurological needs, and inclusivity, which also encompasses identity and can be rooted in a wide range of characteristics, such as race, ethnicity, gender, and life stage.
- Project teams should consider connections between buildings and broader bicycle, pedestrian, and public transit networks. Project teams should adopt an ecosystem mindset and identify gaps in connectivity that could potentially be addressed through project objectives or advocacy (e.g., advocating for progressive zoning policy changes). In addition to implementing project-level interventions, explore opportunities for public investment in mobility improvements beyond the project boundary (e.g., investing in bicycle infrastructure that will allow the building project to connect to the broader bicycle network).
- To encourage better mobility outcomes in building projects, expand available resources around transportation data (e.g., StreetLight Data), bicycle infrastructure design strategies, and pedestrian-friendly design (e.g., continuous sidewalks, referred to as 'continuous pavements' in Europe).
- To achieve goals related to inclusive mobility, design teams should consider the following recommendations, which include example strategies implemented by the Certified Building participants.
    - Incorporate facilities to encourage human-powered and non fossil-fueled based transport:
        - Both FEC and Phipps installed bike racks and showers, and the Phipps Exhibit Staging Center also has lockers.
        - All three project sites provided EV charging infrastructure.
        - The Phipps site established connections to historic and new bicycle networks, providing links between adjacent parks and neighborhoods.
        - Phipps instituted a program of financial incentives including reimbursement for those who do not use a single-occupancy vehicle to commute and a 50% reimbursement on purchase of a bike.
        - Phipps also provides many resources on its website encouraging visitors to bike, including links to maps, names of the specific trails that connect to the site, and descriptions of where bike parking is located on site.

- Locate the project in an area where amenities are accessible without use of a car:
  - The Hazelwood site was chosen in part because of being within walking distance to the main commercial area and transit.
  - All evaluated project sites are accessible by bus.
- Design and site the building to be accessible and inclusive:
  - The FEC and Phipps projects were built in compliance with the Americans with Disabilities Act.
  - The ground floors of the Hazelwood homes were designed and constructed to be fully accessible from the street.
  - Gender-neutral bathrooms installed at FEC avoid stigma and signal belonging.
  - Assistive technologies are being introduced to provide a more complete experience of the park at the FEC.
  - As mentioned under Enhancement of Open Spaces, a sensory garden is under construction at the FEC to improve the experience for a broader range of visitor mobilities; it includes a one-third mile of accessible trails.
  - An ongoing evaluation of accessibility needs at FEC spurred new program offerings and motivated plans to improve accessibility to existing spaces.
  - Siting the project in an area that is convenient to access without a car offers an important degree of sustainability and accessibility, but as noted by staff at the FEC, consideration should be given to multiple types of user mobility.
- Improve the streetscape:
  - Renovating blighted sites can enliven the neighborhood and improve the feeling of safety, which in turn improves walkability and fosters a positive cycle of activity.
  - Integrating new and renovated structures into the existing character of the neighborhood can help strengthen a sense of place and belonging.
- At the building level, BikePGH shared the following additional recommendations to improve bicycle and pedestrian access:
  - At minimum, ensure that bicycle parking is easy to find and more easily accessible than vehicle parking.
  - Provide diverse bicycle parking options that respond to the needs of different types of building occupants (e.g., a customer shopping for 15 minutes will have different bicycle parking needs compared to an employee working for eight hours or a building resident).
  - Install continuous pavements along driveways and building entries as a design solution that prioritizes pedestrians over vehicles.

THE MILLVALE FOOD + ENERGY HUB. PHOTO CREDIT: SOUTH BREEZE PHOTOGRAPHY, COURTESY OF NEW SUN RISING.

4 | Community Resilience + Revitalization

In line with the overall philosophy of LBC, buildings have the opportunity to not only do less bad to their surrounding community but actually contribute a net positive and make the world a better place. ILFI strives to create a resilient and vibrant built environment that is welcoming and accessible and enables all people to participate, prosper, and reach their full potential.

Certified Buildings

Introduction

There are currently no LBC requirements specifically focused on revitalization; however, the cumulative effect of achieving its requirements is intended to contribute positively to the vitality of the surrounding community. For the projects featured in this research, the potential revitalization effect is amplified by the fact that all three sites represent significant reinvestment and renovation in long-blighted areas, including a remediated brownfield. In addition, while none of the current requirements aimed at emergency resilience apply to the projects researched due to scope of certification timing, all are at a minimum lessening the resource burden on the community, which can help buffer the effects of a disaster.

Findings: Neighborhood Revitalization

IMPACT ON OCCUPANTS

Occupants at the Frick Environmental Center (FEC) indicated that since construction of the building, there are more activities and events in the park, it receives more visitors, and the visitors are from a more diverse range of backgrounds. Two thirds of respondents indicated

that the neighborhood felt more vibrant and self-sustaining since construction of the building, and nearly all indicated they thought the building had a positive effect on the vitality of the neighborhood. At the same time, staff acknowledged that the immediate neighborhood surrounding the park was already well-resourced before the building opened.

> *In particular, I think the ESC has had a huge impact on our Facilities team. The provision of a beautiful space for their use is a drastic improvement, and elements of beauty, health and wellness are prevalent.*
>
> EMPLOYEE, PHIPPS EXHIBIT STAGING CENTER

IMPACT ON COMMUNITY

The FEC replaced an abandoned structure that had been vandalized by arson and defaced with graffiti. The building renovation is part of a larger plan to restore the historic entryway and expand the benefits and use of the 650-acre park. To this end, the Parks Conservancy has not only been able to offer more and varied programs with the renovation and opening of the FEC but staff also report anecdotally that the park now receives heavy use in the early morning, late afternoon, and early evening hours. This use is encouraged by the renovated building, landscape, and trail links at the site as well as by the availability of outdoor restrooms connected to the project; at the explicit request of the community, these restrooms remain publicly accessible even when the main building is closed.

At Phipps, prior to construction of the Center for Sustainable Landscapes (CSL), the first of the three certified Phipps buildings, the main shared site was a brownfield and paved over public works yard. Now remediated and restored, it supports not only three regenerative structures, but also a total of 1.5-acres of new green space with over 100 native plant species

BEFORE AND AFTER PHOTOS OF THE PHIPPS EXHIBIT STAGING CENTER. PHOTO CREDITS (FROM LEFT TO RIGHT): HAWKEYE AERIAL PHOTOGRAPHY, PAUL G. WIEGMAN.

representing open meadows, oak woodlands, water's edge, and wetland systems. In addition, prior to construction of the CSL and the Nature Lab, runoff from the site had eroded the hillside and deposited pollutants into Panther Hollow Lake in Schenley Park, which surrounds the Phipps. By capturing all water on site, the Phipps buildings are improving inflow to the lake and supporting the City of Pittsburgh's efforts to restore the lake.

The Hazelwood homes project is part of an intentional effort to revitalize an area that was originally established around heavy industry but has been blighted and vacant for decades in concert with the decline of steel operations. While there has been recent redevelopment on an adjacent industrial area by universities and high tech enterprises, the residential neighborhood has seen lesser investment. Hazelwood is helping to redress this by providing affordable homes that are extremely energy and water efficient, have healthy indoor air, are built with healthy materials, support the local economy, and fit into the character of the neighborhood. The ownership structure is also intentionally designed to keep homes affordable and discourage displacement. This is one of the first new housing projects in the area; not only is it helping enliven the area and improve the streetscape, but it is setting a standard for how high quality development can be achieved.

Findings: Community Resilience and Emergency Preparedness

IMPACT ON OCCUPANTS

One third of survey respondents indicated the resiliency features of the FEC had prompted them to improve emergency preparedness for themselves and their family or to become involved in other community resiliency efforts.

IMPACT ON COMMUNITY

The FEC is grid-tied, and while it generates more power than it uses on an annual basis, it is not set up to provide energy to the building if grid service is interrupted or fails. However, the building design prioritizes low-load passive energy strategies which enable it to remain habitable without power for longer than a typical building. These features also put less stress on the grid during peak demand at times that coincide with when the solar panels are not generating power. In addition, the FEC is in the process of setting up a system that would ensure Wi-Fi access in the event of a power outage.

The FEC has a large cistern that could potentially provide water for toilet flushing or fire suppression, and the garden could contribute toward food-based needs during the growing season. Treatment of all stormwater on site means that the FEC is not contributing to combined sewer overflow (CSO) events.

All of the certified buildings at Phipps share the same passive energy efficient design, energy generation, stormwater management characteristics, and potential food availability as the FEC, with one exception: the Exhibit Staging Center (ESC) has an integrated battery management system, which enables it to generate power during periods of sunshine or wind if the grid went

down. This extends the ESC's habitability even further and potentially provides for reliable communication and a charging center—all of which would be an asset for the community.

LBC Core certification does not include explicit resiliency requirements for single family homes; however, by fully addressing stormwater on site, the Hazelwood homes are also not anticipated to contribute to CSO events. In addition, the highly efficient energy systems and design, which optimize passive strategies, combined with the solar power generation will lessen draws on the electrical grid during times of peak demand.

For all evaluated Certified Building sites combined, the total volume of stormwater kept out of the combined sewer during a 10-year storm event is estimated to be at minimum 500,000 gallons.

Conclusions

NEIGHBORHOOD REVITALIZATION

Particularly in an area that is experiencing investment after an extended period of disinvestment, the potential for unintended negative consequences of revitalization, such as displacement, need to be evaluated and be an explicit point of conversation and responsiveness between the project and the surrounding community.

COMMUNITY RESILIENCE - EMERGENCY PREPAREDNESS

Although requirements specifically directed at resilience were not included as LBC requirements until after certification of the evaluated projects, the water collection and passive energy efficiency strategies confer some degree of building-level resiliency and community benefit. With respect to the current resiliency requirements, only the Energy Petal includes support to the community during a disaster as an optional compliance path. While self-sufficiency at a building scale relieves the burden on the community, it may be worth assessing how resiliency requirements within other Imperatives could include more direct community support.

SOLAR ARRAY AT THE MILLVALE FOOD + ENERGY HUB. IMAGE COURTESY OF NSR.

Community Organizations

Introduction

The impact areas examined in this report relating to local business, open space, mobility, food access, and community engagement all interact to reinforce and contribute to long-term community resilience. While the work of all Community Organization participants intersect in a similar way, Grounded Strategies and Triboro Ecodistrict engage most directly with community revitalization at the neighborhood level.

Findings

NEIGHBORHOOD REVITALIZATION

Grounded Strategies supports neighborhood revitalization efforts in Pittsburgh through programming organized around vacant land activation. The organization approaches this work through a community empowerment approach by providing residents with the tools, resources, and training needed to define collective priorities and develop interventions that are informed by the community's own lived experience. Program highlights include:

- CommunityCare: a land stewardship program providing capacity-building support to local land stewards, who receive a stipend for their participation;
- Community Co-Design: a service provided by Grounded Strategies that involves facilitated consensus building and participatory design with communities to develop vacant land activation solutions;
- Green Playces Initiative: a community co-design process that centers youth voices and environmental education;
- Lots to Love: an online interactive map containing information on every vacant lot in Allegheny County, including ownership and tax delinquency status; and
- Ground Truthing: a data collection and recording strategy that uses resident lived experience along with other verbal, historical, and legal data to better understand the root causes of land disinvestment and loss through a racial justice lens.

Grounded Strategies has worked with over 50 communities in Allegheny County to develop and implement vacant land interventions and create positive outcomes in their neighborhoods. Examples of these outcomes and other relevant metrics include:

- Immediate visible impacts: the removal of blight in neighborhoods;
- Field day participation levels and volunteer hours; and
- Number of stewards participating in the CommunityCare program and number of stewardship hours.

According to the organization, the primary impact of vacant land activation is the improved social well-being that results from instilling a sense of safety, especially in underserved neighborhoods. Addressing safety is an issue that consistently comes up in their work and is a crucial first step in responding to community priorities.

In addition, community building is both an outcome of vacant land activation and a powerful motivator for participation. Anecdotally, CommunityCare stewards have shared that a major reason for their involvement in the work is the opportunity to make friends and meet like-minded people with similar goals around beautifying their neighborhood.

COMMUNITY RESILIENCE

Triboro Ecodistrict is a testament to community resilience not only being an outcome of sustainability work but a powerful motivation for action. The impetus for the Millvale, Etna, and Sharpsburg boroughs organizing around sustainable community development came as a result of environmental justice concerns after devastating flooding events in 2004 and 2007. This became a catalyst for rebuilding sustainably—the identification of Water, Food, and Energy as the first three focus areas of the Ecodistrict planning process was directly informed by the community's lived experience and collective trauma.

Over a decade later, the Ecodistrict focus areas have expanded to include Equity, Mobility, and Air, and Triboro Ecodistrict has implemented several projects to improve the community's resilience. An excellent example of this is the Millvale Food + Energy Hub, a mixed-use adaptive reuse project that contains a solar microgrid system that also serves the basis for a solar workforce development program. The building hosts an assortment of tenants which include a food entrepreneur and nonprofit organizations working to improve food access in Pittsburgh and change Millvale's previous status as a food desert.

Conclusions: Applicability to Buildings

The experience of community-based organizations reveals that diverse opportunities exist for building projects to revitalize their surrounding neighborhoods and improve the resilience of local communities. Examining the neighborhood context of the building, including local perceptions around safety, underutilization, or even blight, can highlight these opportunities and help to identify potential design interventions or local investments that project teams can explore. Focusing efforts on understanding environmental justice issues can drive innovation at the building level, as exemplified by projects such as the Millvale Food + Energy Hub.

Guidance and Example Strategies for the Building Industry

- In community engagement initiatives, ensure that the sense of safety experienced by community members is included in the assessment. Community engagement should also aim to identify and highlight any environmental justice concerns and gaps in community resilience that can be addressed by the building project.
- Teams developing projects in disinvested areas should engage with the community early in design to understand and respond to the community's perspective on unintended consequences of revitalization.
- Explore opportunities for involvement or investment in neighborhood revitalization efforts beyond the project boundary (e.g., supporting the restoration of a vacant or underutilized lot near the project site). This is a good topic for community engagement early on and may not require major design moves but rather a shift in perspective and intention regarding sharing space and resources.
- To achieve goals related to community resilience and revitalization, design teams should consider the following recommendations, which include example strategies implemented by the Certified Building participants.
    - Reinvest in blighted, degraded areas:
        - The projects at Phipps remediated, pulled up pavement, and restored the site of a former public works fueling station.
        - The FEC renovated a defaced burned-out building and restored a sense of grandeur and welcome to the neglected entryway of a major city park.
        - The FEC and Phipps projects all restored and invigorated degraded natural landscapes.
        - The Hazelwood homes are bringing reinvestment to a neglected neighborhood with a focus on complementing the existing character, providing high quality affordable homes, and avoiding displacement.
    - Design for extended habitability and reduced consumption during periods of peak grid demand:
        - All projects prioritized low-load passive energy efficient design.
        - All sites installed on-site power generation with solar panels, and the Phipps ESC also has a wind turbine.
        - The ESC also installed battery storage which provides the potential for grid-independent operation.
    - Manage stormwater in a way that does not contribute to CSO events:

- All project sites installed on-site infiltration systems which included swales, irrigation, rain gardens, permeable paving, or unlined Aquablox-filled tanks.
- The FEC's system also directs flows to maintain the health of an existing wetland.
- The FEC and all certified buildings at Phipps also installed systems for rainwater capture and nonpotable reuse employing tanks, and in the case of Phipps, a treatment lagoon as well.

- Install and maintain planting beds to provide the potential for fresh food:
  - See Example Strategies under Access to Local Food

BATTERY INSTALLATION AT THE PHIPPS EXHIBIT STAGING CENTER. PHOTO CREDIT: ROB LARSON.

ROOFTOP EDIBLE GARDEN AT THE PHIPPS CONSERVATORY. PHOTO CREDIT: PAUL G. WIEGMAN.

5 | Access to Local Food

Regardless of typology or function, buildings can integrate opportunities for connecting the community to fresh, locally grown food. Facilitating or enhancing food access has the potential to yield far-reaching impacts throughout the community, particularly in neighborhoods with food apartheid.

Certified Buildings

Introduction

Although the current urban agriculture requirement in LBC does not apply to all of the participating buildings due to the site location or the timing or scope of certification, all sites have found opportunities to grow food, provide education about current and traditional ways to gather and cultivate food, or increase access to locally grown food.

Findings

IMPACT ON OCCUPANTS

All survey respondents at the Frick Environmental Center (FEC) indicated that they benefited from its on-site gardens and one third indicated that they use the on-site Community Supported Agriculture (CSA) pick-up. Further, two thirds of respondents indicated that the access to the building gardens had increased their connection to locally grown food more broadly by starting vegetable gardens at their own homes, joining a CSA, or making a point of seeking out locally grown produce at farmer's markets and conventional grocers.

IMPACT ON COMMUNITY

The natural landscape surrounding the FEC meant that it was designated as a site where the urban agriculture requirements of the LBC did not apply. Nevertheless, the project included a total of more than 5,000 square feet of demonstration garden, pollinator garden, and of particular note, the From Slavery to Freedom Garden, which reaches beyond the simple goal of connecting people to food. With an approach motivated by both the LBC Equity Petal and community input during project planning and design, the garden carves out a space to highlight the struggles, knowledge, and survival of enslaved people as they took different paths to freedom and provided for themselves after reaching free lands. The garden honors their lives, keeps their stories and legacy visible, and helps make a tangible connection for current generations, bridging between the past and present.

A diverse suite of educational programming centered on the From Slavery to Freedom Garden has reached hundreds of people. In 2023 alone, 137 individuals participated in activities and learning specifically focused on the garden and another 250 young people experienced the garden during summer camp. The garden is also the focus of special events such as a Juneteenth celebration for families and a fall harvest festival focused on cooking using traditional crops. Both by its mere existence and the active focus for activities and learning, the garden provides a meaningful connection to food as well as a space of inclusivity.

The FEC encourages visitors to take the edibles grown in the demonstration garden and From Slavery to Freedom Garden, though many people are unaccustomed to freely taking food from a public garden. Food that is not taken by program participants or other visitors is harvested by staff to avoid it going to waste. The FEC initially pursued an arrangement to share food from the gardens with a local food distribution nonprofit; however, this ended up not being sustainable, as the FEC gardens did not provide a sufficient quantity with enough consistency to make it a viable source for the nonprofit.

At Phipps, though the urban agriculture requirement applied only to the Nature Lab and the Exhibit Staging Center (ESC), it could be argued that as an organization, Phipps had already maximized the intent of the requirement independent of the Living Building Challenge. On site, Phipps has a vertical edible garden, a food production greenhouse, an edible food display garden, and herbs planted in the green roof of the Center for Sustainable Landscapes (CSL). All of the produce is harvested and used for the on-site cafe, Phipps' catering offerings, and other programming needs. The edible display garden brings the idea of growing food to life for visitors, as does the knowledge that Phipps itself is a primary source for food served anywhere on the grounds. Phipps also holds an annual fundraiser to support local food banks that features freshly grown tomatoes and garlic at their seasonal peak.

Off site, through its Homegrown community agriculture program, Phipps has installed 2,800 square feet of backyard raised-bed vegetable gardens at no charge to over 235 families and provided training and knowledge to hundreds of additional community members. The intent of the program is to empower the underserved in local communities. The program includes mentorship by Phipps staff over two growing seasons as well as other support and resources.

The Hazelwood project, which is pursuing LBC Core, does not have a local food requirement but includes space in the homes' small side and backyards where vegetable beds could be established.

Conclusions

Efforts to reconnect people to food offer a wide range of opportunities and providing a variety of ways to meet the requirement that recognizes different building functions and contexts is valuable. The diversity of the From Slavery to Freedom Garden and CSA pick-up both successfully provided at the FEC illustrate these points. They are also underscored by the fact that the original plan at the FEC to contribute the produce from the garden to a food pantry could not be sustained because it did not generate enough food, which demonstrates the reality that raising food takes commitment and attention and is not practical for all building and project types. However, at Phipps, growing food on site and using it to both educate and feed visitors is feasible and fits wonderfully with its mission. Installing raised beds throughout the community also fits within both its mission and capacity.

Connecting people to food can be done in ways that provide a multitude of benefits. For example, the garden-based programming at the FEC provides:

- Education about wild edibles and cultural foodways;
- Education and visibility around slavery and a sense of recognition and inclusivity for the descendants of slaves;
- Hands-on education (with wheelchair accessibility) about growing and harvesting healthy food;
- A free source of healthy food available to the public and employees;
- Inspiration among those who experience it to seek out and grow healthy local food in their daily lives; and
- A peaceful place to stroll or rest.

Community Organizations

Introduction

The existence of food deserts and food apartheid has been described by participants as an issue experienced by many Pittsburgh neighborhoods. Over the last two decades, an ecosystem of community-based food growers has emerged to address this, improving both food access and land access for the city's residents made vulnerable to poverty. Grow Pittsburgh is one such organization; through their work in Community Projects, School Gardens, and Food Production sites, the nonprofit has developed expertise and implemented strategies to scale impact and expand the intersecting benefits of food growing for the community.

Findings

When asked to consider which outcomes of urban agriculture are most impactful for the communities they serve, Grow Pittsburgh emphasized that different community groups enter the food-growing space with varying priorities and needs. In their experience, while access to healthy, affordable food is a primary concern, community members often have diverse reasons for why they want to establish a garden. Some examples include creating a gathering space in their neighborhood centered on food growing or providing opportunities for exercise in neighborhoods with a large senior population.

The effectiveness of Grow Pittsburgh's work lies in its ability to meet people where they are and to tailor initiatives to respond to the individual garden or community's distinct priorities. Their approach also accommodates diverse levels of experience and capacity, acknowledging that not everyone feels comfortable entering the food-growing space. This culture of inclusion is central to Grow Pittsburgh's mission as a social justice organization.

Regardless of community priorities around engaging in urban agriculture, Grow Pittsburgh notes that a common impact across gardens is the cultivation of social well-being. Community-building and third place creation are intrinsic to community food growing, and social anchors exist within many of the gardens the organization supports:

> *Food is a noncontroversial topic, and you can really come together.*
>
> DORA WALMSLEY, GROW PITTSBURGH

In addition to positive social outcomes, Grow Pittsburgh's impact is also assessed through the following metrics:

- Pounds of food grown;
- Number of gardens established or supported; and
- Individuals engaged (e.g., communities supported, participation levels in educational initiatives and workshops, and members of their Garden Resource Center)

The participant noted that in the future, it would be interesting to measure the impact of culturally aligned food grown by immigrant and refugee communities. For example, one community garden the organization supports includes members who are primarily from Pittsburgh's Bhutanese community.

Finally, a key impact of Grow Pittsburgh's work is the trust built with the communities they work within. While more difficult to measure, this is an outcome that the organization strives to achieve.

Conclusions: Applicability to Buildings

For building projects, Grow Pittsburgh stresses the importance of supporting locally grown food in a way that is tailored to a hyper-local setting. To accomplish this, project teams are encouraged to meaningfully examine the local food access ecosystem in the community where the building is located, and identify what can be leveraged to fill gaps. Depending on the assessed community needs, strategies could include:

- Partnering with local food growers or participating in CSA programs to supply food service providers or cafeterias in the building;
- Inviting locally-owned small food businesses to be building tenants; and
- Providing actual food-growing spaces in the project site, with corresponding programming around food-growing activities.

FROM SLAVERY TO FREEDOM GARDEN AT THE FRICK ENVIRONMENTAL CENTER

Guidance and Example Strategies for the Building Industry

- Building project teams should establish objectives for facilitating a connection with local food for the occupants, the community, or both. There are many ways to do this, and even where strategies are attuned to the building and occupants, they can result in ripple effects that benefit the community.
- As part of the objective-setting process related to local food, project teams should assess the local food access ecosystem and leverage opportunities to fill gaps through design, partnerships, or other programmatic approaches.
- To optimize the long-term value of on-site food-growing spaces, they should be designed with the specific priorities of the intended users in mind.
- To achieve goals related to local food access, design teams should consider the following recommendations, which include example strategies implemented by the Certified Building participants.
    - Establish on-site gardens:
        - The FEC's From Slavery to Freedom Garden was designed and installed to generate vegetables and provide education about cultural history, gardening, and native edibles.
        - Edible display gardens and production greenhouses provide food for visitors, programming, and staff at the FEC and Phipps sites.
        - Phipps demonstrated how edibles can be creatively integrated with buildings via green roof and vertical wall plantings.
        - The Hazelwood sites provided space for gardens on small residential in-fill sites.
    - Work with the community to create off-site gardens:
        - Phipps provided raised beds, mentoring, and resources to local underserved communities; installing or helping to create a new community garden plot is another great strategy.
    - Connect with local growers and purveyors:
        - Phipps and the FEC both set up a CSA pick-up spot on site.
        - Both Phipps and the FEC have incorporated into their programming events such as harvest festivals or fundraisers featuring education and locally grown and prepared dishes featuring seasonal fruits and vegetables.

PHOTO CREDIT: SOUTH BREEEZE PHOTOGRAPHY, COURTESY OF NEW SUN RISING

6 | Community Engagement and Empowerment

Buildings are inherently part of a community; thus they have the opportunity to impact the community, both positively and negatively, from the outset of the design process through ongoing operations. The built environment can integrate and highlight the unique characteristics found in every community so the site's story can be honored, protected and enhanced.

Actively and thoughtfully engaging with community members to understand the community's identity, needs, and assets can enable a building to positively impact the culture of the neighborhood.

Certified Buildings

Introduction

Engagement with the community and developing an understanding of both its needs and its existing assets is important during planning and design of a project as well as during its ongoing operation and occupancy. While an explicit community engagement requirement was not included in LBC until after all but one of the evaluated projects had been certified, various forms of community engagement is seen in all of them.

Findings

IMPACT ON OCCUPANTS

All survey respondents at the Frick Environmental Center (FEC) indicated an awareness of ongoing activities or relationships with the community (discussed further below). Most were aware of building-sponsored events out in the community and all indicated that they had had opportunities to participate in community outreach and events. One occupant commented, however, that they see no acknowledgement of indigenous communities or attempts to build relationships with them.

IMPACT ON COMMUNITY

In the planning and design stages of the Frick Environmental Center (FEC), the Parks Conservancy worked with a consultant to develop a community input process, placing a particular emphasis on how the center could help better serve underserved communities and children within the vicinity of the park and potentially throughout the city. A total of 81 local residents provided direct feedback through focus groups and brief informal interviews. A primary outcome of this input was the development of the From Slavery to Freedom Garden to provide programming and space that would feel both relevant and welcoming to much of the underserved population (see more about the garden under Access to Local Food). The Parks Conservancy continues to develop programs and services to overcome the barriers identified in the community engagement process.

The Hazelwood project also involved a robust community engagement process throughout its design development phases, which built upon a pre-existing community vision plan for the neighborhood developed by the community. The project contributed to many goals articulated in the community's vision plan, including design and systems to provide high quality indoor air (in a region that has some of the worst air quality in the country), treating stormwater in a way that will not contribute to combined sewer overflows, and establishing a model for healthy sustainable development.

In addition, the Hazelwood community's active engagement throughout the design process drove an aesthetic and materials palette that sought to retain the existing character of the neighborhood, which the architects acknowledged would not otherwise have been their approach. This reflected the community's concerns about displacement and the desire that new development be for the community—strengthening what already exists rather than inserting design and lifestyle preferences from outside.

From the perspective of ongoing operations, one of the primary functions of the FEC is to enable ongoing community engagement and education. The FEC's offerings span nature education and connection, cultural history, and the regenerative aspects of the Living Building, all of which attract community participation. Their structured education and summer camp programs alone involved 2,100 participants in 2023. Park visitors also informally use the building facilities and grounds, including the indoor Living Room, restrooms, trails, and gathering areas.

In addition, the FEC opens up its building and grounds for use by mission-aligned organizations such as the Pennsylvania Master Naturalists, Southwestern Pennsylvania Mushroom Club, the Women and Girls Foundation, and Age-Friendly (a group focused on seniors) with activities focused on healing, art, connection to nature, and socializing. Previously, the FEC also had volunteer programs, but they were disrupted by the COVID-19 pandemic and have not yet been restarted.

The Phipps Conservatory and Botanical Garden is a well-loved institution with an annual visitorship exceeding 500,000 annually. With respect to the local community, the beauty, inspiration, and education components of Phipps' mission provide the most direct impact, and all are furthered by their three certified buildings. Additional information about their local education programming, with specific reference to regenerative building, is provided under Education and Awareness of Regenerative Design. Other programs designed specifically to benefit the local community include Learning for a Greener Future, a paid summer internship offered to lower income students in Pittsburgh that is housed in the Nature Lab (described under Contribution to Workforce and Local Businesses), and Homegrown, their free home garden installation and mentoring program (described under Access to Local Food).

Conclusions

A robust community engagement process can provide clear goals for the project and influence the building design and function to the mutual benefit of the community and project developer. Such results are clearly facilitated when the community has already organized and defined a vision; regardless, an authentic effort to understand the needs and assets of the building's surrounding community is an important part of the design and development process and can result in meaningful benefits for the community.

HOPE FOR TOMORROW AND RIVERLIFE PROJECT PLANNING WORKSHOP. PHOTO CREDIT: RIVERLIFE

Community Organizations

Introduction

While their impact areas are diverse, all Community Organization participants have community engagement at the core of their work. Trust built with community members is a powerful outcome of meaningful engagement, and the best practices for achieving this can effectively be applied by project teams working in the building industry.

Findings

Community-based organizations employ various forms of engagement to pursue their mission. For example, creative placemaking and community co-creation are central to Shiftworks's practice; in the creation of public art, communities are not merely clients but valued collaborators. The organization affirms that the process of co-creation is in fact more impactful than the art created, because it is during this process that the majority of relationships with the community are cultivated and strengthened—art is seen by Shiftworks as a tool for building connections that shape the social and cultural fabric of communities.

Other examples of community engagement embedded in the participants' work include:

- Grounded Strategies's Community Co-Design initiative, which relies on consensus building and participatory design to develop vacant land activation solutions;
- Riverlife's three-phase engagement process to inform their vision plan for Pittsburgh's downtown riverfronts: Looking Back, Looking Ahead, and Moving to Action; and
- Triboro Ecodistrict's sustainable community development planning processes, which channeled the community's collective trauma due to devastating flooding events into mutual support and action.

It is important to reiterate that the primary impacts of community engagement are relationships cultivated, trust built, and social cohesion bolstered.

Conclusions: Applicability to Building Projects

There are many ways to translate the strategies of community-based organizations into best practices for more robust community engagement in the building industry. A number of approaches are highlighted below.

Grounded Strategies stresses the importance of ensuring that early internal work is conducted by project teams before beginning any outreach or engagement activities with communities. This could include:

- Securing sufficient funding, staffing, and capacity to meet community engagement goals, and making sure any gaps are addressed internally prior to starting outreach; and

- Ensuring early research is done to identify the most appropriate medium of communication or the most appropriate space and time of day to hold meetings so that community members can easily participate.

One point consistently raised by participants is that the timing of community engagement is crucial. Given the most impactful decisions are often made in the early stages of a building project, early engagement is one of the best ways to ensure that the community's feedback is actually integrated into design interventions. Front-loading this work, with the goal of establishing the shared vision for a project before any design work is started, will build stronger relationships with the community; conversely, engaging with the community after decisions have been made does not build trust.

> *Engage early and often. Especially early.*
>
> **GAVIN WHITE, RIVERLIFE**

In addition, some participants noted that offering stipends to community members conveys that the project team recognizes the value of their time. Beyond providing an incentive for participation, this is an effective way to gain trust and build good working relationships with the community. Similarly, budgeting for community engagement meetings should also include providing food, childcare, or transportation costs, if feasible.

Reflecting on how to avoid community engagement practices that might feel extractive or transactional, Community Organization participants shared a variety of strategies that can be applied by building project teams. One approach is to embrace the deeply relational nature of this work and advance opportunities for community-building that go beyond basic information gathering or surveys. This could take the form of community dinners or hands-on activities that provide space for creativity. Riverlife, for example, included a modeling clay sculpture activity in one of their community engagement processes, which inspired the landscape architect's design of playscapes on the project site. According to the organization, playfulness can be an effective strategy for more meaningful engagement.

> *[T]here is a sterility to that approach that doesn't allow for rapport, and doesn't allow for a level of vulnerability from the surveyor. When you're asking somebody to share information that's important or meaningful to [them], that's a vulnerable moment, and if a connection hasn't happened, it's unlikely that the data or the information you're going to get from that person is going to be as robust as it could be.*
>
> **DORA WALMSLEY OF GROW PITTSBURGH, ON RELYING TOO MUCH ON SURVEYS**

Maintaining consistency is another important aspect of community engagement. This involves clearly communicating how the community's feedback will be (or has been) used to inform design decisions in the project and guaranteeing that there are clear plans in place to address turnover—of both project team members and community representatives—so that trust or momentum built is not lost.

Ultimately, participants emphasize the value of partnering with an organization that is already deeply embedded in the community or hiring someone from the community to be a part of the project team. In addition to building rapport early in the engagement process, this is an effective way to achieve alignment between project outcomes and community priorities. For example, partnering with the local community development corporation can allow a project team to quickly identify the community's issues, existing plans, and collective vision. Working with locals embedded in the community can provide "a granularity of understanding around how the community is functioning"[10]—including which communication methods work best—and create opportunities to transform engagement into real collaboration.

Finally, building project teams are encouraged to explore opportunities to create long-term impacts for the community beyond the project timeline. Examples cited include community benefits agreements (CBAs) and tax credit programs such as the Educational Improvement Tax Credit and the Neighborhood Partnership Program.

PHOTO FROM RIVERLIFE'S HOPE FOR TOMORROW PROJECT PLANNING WORKSHOP. PHOTO COURTESY OF RIVERLIFE.

10 Sallyann Kluz, Shiftworks

Guidance and Example Strategies for the Building Industry

- Project teams should develop objectives for learning about the current and historical culture of the community, including the indigenous culture that originally thrived on the site, and honoring that culture in the project design to foster a sense of place and connection.
- Supported by organizations such as ILFI, the building industry should develop additional strategies and incentives for partnerships with community-based organizations, including participation in CBAs or other similar programs that directly benefit the local community.
- To encourage more robust community engagement practices in building projects, project teams should consider the recommendations shared by Community Organization participants (discussed above).
- Project teams should develop and implement a robust community engagement process, which includes outreach to indigenous populations, to identify how the project can support and further the community's vision for itself. In addition to the recommendations outlined by the Community Organization participants above, project teams should consider the following, which include example strategies implemented by the Certified Building participants.
    - Engage the community during project planning and design:
        - Focus groups and brief informal interviews helped the FEC understand community needs and barriers and resulted in specific requests being included in the project to serve the community.
        - The Hazelwood outreach effort included multiple ways to inform and involve by holding design charrettes and also presenting at standing public meetings organized by other entities.
    - Reflect community input in building features:
        - The Hazelwood homes design incorporated efficient ventilation systems and filtration in direct response to community concerns about local air pollution problems.
        - The Hazelwood project addressed concerns about stormwater issues raised in the community engagement process by retaining stormwater on site using both an innovative storage solution and infiltration.
        - The FEC responded to a specific request in the public engagement process by keeping outdoor bathrooms open in sync with community use patterns even if the building is closed.

- Engage the community through ongoing programming:
  - An awareness of community needs allowed building owners to respond with ongoing programming such as the From Slavery to Freedom Garden at the FEC and Phipps's Homegrown garden installations and Learning for a Greener Future internship.
  - The FEC has an ongoing arrangement with several mission-aligned organizations to provide space for their events in the building.
  - Both Phipps and the FEC hold periodic community-oriented events such as Juneteenth celebrations, harvest festivals, and fundraisers, which offer a singular type of engagement to reach varied sectors of the community.

INSTALLATION OF TWO FLINTS, A FIRE; A FIRE QUENCHED BY ARTIST SARIKA GOULATIA; PHOTO BY ROB LONG, COURTESY SHIFTWORKS

TOUR OF FRICK ENVIRONMENTAL CENTER. IMAGE COURTESY OF GREEN BUILDING ALIANCE

7 | Education and Awareness around Regenerative Design

Buildings have the opportunity to provide educational materials about their operation and performance to the occupants and the public, which can in turn spark inspiration, share successful solutions, and catalyze broader change.

Certified Buildings

Introduction

Education and awareness of regenerative design has long been an emphasis of LBC, which includes explicit requirements around interpretive information and public open days. While many of the buildings included in this project were built for the specific purpose of supporting educational missions, research revealed that education is being achieved not only as a result of intentional efforts but also as a side benefit of working in and on LBC projects.

Findings

IMPACT ON OCCUPANTS

At the Frick Environmental Center (FEC), on-site education starts with an operations manual advising how to operate the building and explaining why proper operation is important. This manual is a prerequisite read for any staff person who operates or maintains one or more of the building systems. A more concise brochure is available to staff and visitors who interface with the systems at the user level.

All employees that responded to the FEC survey indicated that the educational material about the building had increased their knowledge and understanding of regenerative or sustainable building. Just over 80% indicated the increased understanding prompted them to become more involved in sustainable or regenerative design by learning more on their own, incorporating more sustainable elements in their own home, advocating to policymakers, or taking other actions.

IMPACT ON COMMUNITY

The regenerative features of the FEC are prominently displayed on its website including links to learn more about LBC and its performance requirements. The website also contains a building dashboard displaying a whole suite of live data from the building including energy generated and water collected, along with a video tutorial. Five different lesson bundles focused on different aspects of the building and sustainability, including the FEC's energy usage, solar power, water, the From Slavery to Freedom Garden, and the UN Sustainable Development Goals, are also available on the website.

At the building itself, interpretive signage has been installed at strategic interior and exterior locations. The FEC has collaborated with different organizations to periodically provide free tours to middle and high school groups. In 2023, the FEC led 30 building tours which included a total of 613 participants.

The Hazelwood design team and owners have already started sharing information about the project by contributing to a piece for ILFI's TrimTab blog and by presenting to other affordable housing projects in ILFI's current Affordable Housing cohort. The team highlights points of learning, which include the relationship between embodied carbon and financial costs of short-lived materials as well as how stormwater management goals can be met through a structural approach that also reduces embodied carbon. In addition, the project team admits to uncertainty at the outset about whether LBC Core's materials requirements could be met; the team found that they could not only be met but exceeded in some areas. The architecture firm was also able to establish internal systems that will make subsequent projects proceed more efficiently.

It is also worth noting that the Hazelwood architects also worked on the Phipps Nature Lab, which utilizes the same modular concept and fabricator. The project team disclosed that the Phipps experience was crucial in giving them a foundation for adapting the modular approach to the Hazelwood homes, indicating that adapting it to meet LBC Core requirements for an affordable housing project would have been too challenging without that prior experience.

Once the first homes at Hazelwood are completed, operation and maintenance manuals will be developed for the homeowners, and there will be public open days before occupancy featuring the buildings' regenerative elements. The Hazelwood homes have garnered much interest from the Pittsburgh building community, and both the developer and consultant team believe they have created an excellent template that can be readily replicated, representing a major opportunity for increasing awareness of regenerative building.

> *Having been through the process once, we have the template. While every site and community brings new challenges, we believe we can build more of these, and we can stretch to achieve more parameters of the LBC program in the pursuit of even more affordable living environments.*
>
> **MIKE GWIN, ROTHSCHILD DOYNO COLLABORATIVE**

As mentioned above in Community Engagement and Empowerment, educating about sustainability is part of Phipps's mission, and it delivers education on regenerative building and design in a variety of ways. To begin with, comprehensive information about each of the certified buildings is available on its website. Explanatory signs in the buildings enable self-led tours, though docent-led tours are also available. Energy-generation and water-capture equipment is exposed at the Exhibit Staging Center (ESC) and Nature Lab for guests to see and better understand as is the wastewater treatment wetland. In terms of exposure, 6,800 people visited the Center for Sustainable Landscapes (CSL) in just the first 70 days that it was open, and Phipps estimates that the building gets 250,000 visitors annually. In addition, the Nature Lab's primary function is as a classroom designed as a hands-on teaching tool. The Nature Lab is also the on-site base for an internship focused on various aspects of environmental science and careers which culminates with graduates leading regular tours of the certified buildings (see Contribution to Workforce and Local Businesses for more information).

LEARNING WHAT MAKES THINGS GROW AT THE FRICK ENVIRONMENTAL CENTER'S FROM SLAVERY TO FREEDOM GARDEN

The design and construction process itself also led to learning for the projects at Phipps. The project team started with educating the general contractors given their critical link to subcontractors and suppliers. One of the millwork fabricators contributing to the CSL became Forest Stewardship Council's (FSC) certified, and as mentioned above, the experience working on the Nature Lab's modular structure inspired the architects to use the same modular concept and fabricator for the Hazelwood project.

In addition, Phipps has ongoing relationships with universities to use any of the buildings to advance research on regenerative design. For example, different student analyses informed the embodied carbon recommendations for the CSL and evaluated the benefits and metrics of the landscape restoration of the surrounding site.

Finally, Phipps also collaborated with ILFI to publish Building In Bloom about the CSL, and more than 2,000 copies have been distributed to date.

Conclusions

Educating and promoting awareness of regenerative design is facilitated by a project owner that has a public service and education mission. Most of the projects assessed have that mission alignment and continue to place an ongoing emphasis on education. They are able to reach many people by employing a variety of different approaches focused on a range of populations and ages. Occupants also note that what they have learned about the buildings has translated to additional learning or action in their personal lives.

Both project teams and owners report learning through the design process, regardless of the building's function or the owner's ultimate interest, and this knowledge can be brought forward to subsequent projects.

Community Organizations

Introduction

Regenerative design is informed by the interaction of the different impact areas examined in this report. With education and advocacy intrinsic to their work, Community Organization participants shared their feedback on how regenerative building projects can scale impact and inspire the communities in which they are located.

Findings

The programs and initiatives of community-based organizations often contain an educational component rooted in various aspects of sustainability. Examples include Monmade's Green Leap program, Grounded Strategies's land stewardship training, and Shiftworks's Environment, Health, and Public Art Initiative.

Triboro Ecodistrict's initial planning process is an apt illustration of how sustainability education

can be embedded in community engagement. According to co-founder Brian Wolovich, the first year of engagement was dedicated to "increasing the 'green IQ' of the neighbors so they could participate more meaningfully in the planning process." Their goals were twofold: first, to harness the community's lived experience around environmental issues and translate these experiences into plans for action and next, to increase community members' comfort level around engaging with sustainability concepts by "demystifying language that can feel elitist or inaccessible at times."

> *[O]ur first substantial engagement, six months to a year, didn't have anything to do with planning. It had everything to do with education. And increasing the green IQ of the neighbors and of the community at large so that they can participate in the actual planning process– so they don't feel bowled over by conversations that can feel inaccessible or can feel not for them.*
>
> **BRIAN WOLOVICH, TRIBORO ECODISTRICT**

This approach proved worthwhile; in addition to building relationships, it equipped residents with the foundational knowledge needed to connect their lived experiences to broader sustainability concepts, resulting in a more robust community development planning process.

A SIGN OUTSIDE THE PHIPPS NATURE LAB EXPLAINS THE BENEFITS OF RAIN GARDENS. PHOTO COURTESY OF PHIPPS CONSERVATORY AND BOTANICAL GARDENS.

Conclusions: Applicability to Building Projects

For building projects aiming to inspire and educate the public about regenerative design, participants suggest that involving community members in decision-making can have a profound impact because it inherently encourages engagement with sustainability issues and solutions. The sense of agency and ownership this creates is a powerful catalyst for change and significantly increases the possibility for community members to replicate what they learn about regenerative practices.

Additionally, building projects are encouraged to consider opportunities to create a hub where community members can self-organize around their sustainability passion points, whether through physical spaces or programmatic offerings. This empowerment approach has been effective for BikePGH in their support for the creation of neighborhood-level bike/pedestrian committees. Similarly, Triboro Ecodistrict has cultivated an ecosystem of people and partnerships organized around specific focus areas so that people can naturally engage with issues they identify with. An example of this is the cluster of food access advocates housed within the Millvale Food + Energy Hub.

To create advocates among building occupants, Dora Walmsley of Grow Pittsburgh recommends that Living Buildings strive to go beyond providing regenerative features and ensure that occupants are able to fully engage with those features:

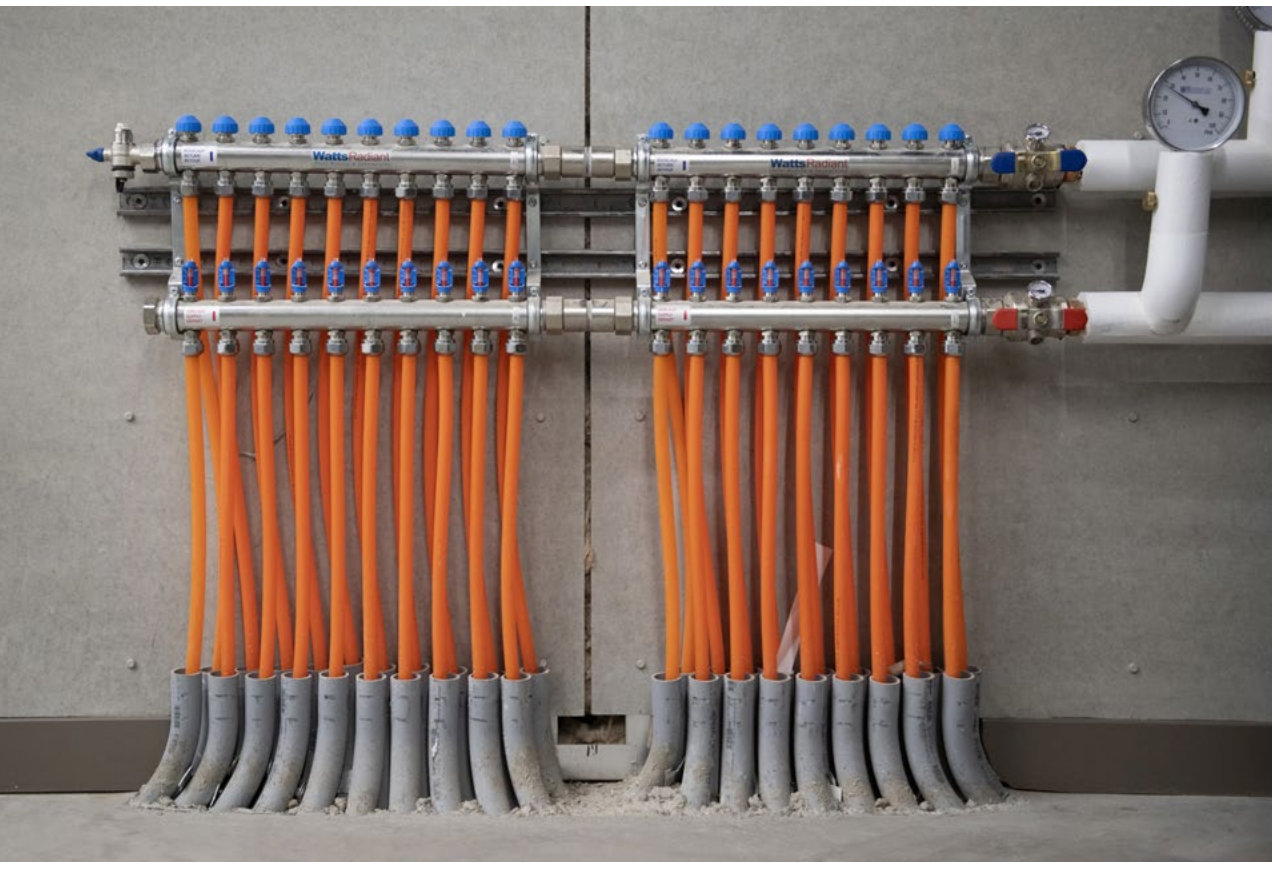
> *It's one thing to have a rooftop garden, it's something completely different for somebody to know that that rooftop garden exists but doesn't have the time, capacity, or knowledge to engage with it. So when we think about occupancy, how are the occupants, how are the building owners, how is the leadership of that space allowing or clearing a path for those tenants or those occupants to fully engage with these benefits of a Living Building?*
>
> **DORA WALMSLEY, GROW PITTSBURGH**

According to Walmsley, active engagement with the regenerative features of a building is one of the most effective ways to stimulate positive change within a building occupant's individual choices.

Lastly, as building projects celebrate successes around creating regenerative outcomes, instilling a sense of ownership and pride in the local community should always be a priority.

This is wonderfully illustrated in an anecdote shared by Triboro Ecodistrict: before installing the first solar panels in the Millvale public library, local school children were asked to sign the back of each panel, symbolizing their role in creating a more regenerative future.

> *Your neighborhood is a place where green technology happens. You live in a place where the future is happening. Your dad, who's an electrician, he's making the future happen. You need to have pride in that fact, so it's instilling a sense of community and hope.*
>
> **BRIAN WOLOVICH, TRIBORO ECODISTRICT**



EXPOSED PIPES AT PHIPPS CONSERVATORY EXHIBIT STAGING CENTER. PHOTO CREDIT: ROB LARSON.

Guidance and Example Strategies for the Building Industry

- Consider opportunities for sustainability education to be embedded within all community engagement and workforce development initiatives.
- Explore opportunities to create, host, or support spaces—physical or programmatic—where building occupants and community members can self-organize around their sustainability passion points (e.g., the Millvale Food + Energy Hub).
- Expand available resources and case studies to include examples and best practices on how building occupants can deeply engage with regenerative features in buildings (e.g., food-growing programs and workforce development programs tied to the building's regenerative systems).
- Ensure that the local community is always included and celebrated when sharing project successes.
- Project teams should share information about the regenerative aspects of the building with on-site occupants and operators as well as with the local community and the broader public.
- To achieve goals related to education and awareness around regenerative design, teams should consider the following recommendations, which include example strategies implemented by the Certified Building participants:
    - Take advantage of the internet and other media to provide different types of information about the building:
        - The FEC and Phipps have developed extensive online offerings including:
        - Written information, case studies, photos, maps, videos, and interactive content to engage different types of learners;
        - Links leading to successively more detailed content to reach people with varied levels of interest and previous knowledge; and
        - A live data display at the FEC to help translate ideas into reality without being at the site.
        - Phipps Director Richard Piacentini reached an expanded audience by delivering a TEDx presentation, which is now available online.
        - James Brown, Director of the FEC, did an on-site interview for a local TV program, which is now available online.
    - Highlight sustainable features of the building on site:
        - The FEC and Phipps have used a variety of means on site to educate people about the building, including the following:

- Interpretive signs on site to provide meaning and context to what is being seen and experienced;
- Self-led or staff/volunteer-led tours to provide flexibility and accommodate different levels of interest and schedules;
- Mission-aligned programming that features the sustainable elements of the building to amplify the benefits and impact of the building; and
- Curricula that has both classroom and on-site components adapted to various age levels to help bring concepts to life.

- Engage with institutions of learning:
  - Phipps has established relationships with universities to make the building available for analyses and research, which offers learning for students, building owners, and the building industry.
- Engage with professional peers:
  - The Hazelwood team has shared information about the building within professional networks through webinars and blogs and already applied its own learning to subsequent projects.
  - The projects at Phipps and the FEC have been highlighted at professional convenings, including ILFI's Living Future Conference.
  - Phipps highlights the design team, contractors, and suppliers that contributed to its projects' successes on its website to promote their knowledge and skills, which can be applied to the benefit of other projects.

PUBLIC PROGRAMMING AT FEC INCLUDES A CHILDREN'S STORYTIME EVENT. PHOTO CREDIT: FRICK ENVIRONMENTAL CENTER.

PHOTO CREDIT: PHIPPS CONSERVATORY AND BOTANICAL GARDENS

Conclusion

Overall Conclusion of Findings

ILFI's Living Building Challenge projects have had a significant and multi-faceted impact on the community of Pittsburgh. These projects have spurred not only environmental benefits but also social, economic, and educational advancements within the community as outlined in this report; however, fully capturing and quantifying these impacts remains a challenge. The Certified Building participants provided crucial information for this research, demonstrating that surveys, interviews, and measured metrics are essential tools in this endeavor and resulting in a more comprehensive understanding of the true benefits these regenerative buildings bring to the community.

The valuable insights and expertise shared by Pittsburgh's community-based organizations were also pivotal to the knowledge gained in this research. Learning from their hands-on experience in creating positive outcomes across the impact areas was instrumental in investigating how buildings can more meaningfully benefit local communities. Many of the metrics and best practices shared by Community Organization participants are clearly replicable and can be translated into actionable strategies for building projects as discussed throughout this report.

Overall conclusions for creating buildings that are regenerative not only from an environmental standpoint, but also from a community-focused social, economic, and educational perspective, are included below.

1 Mission alignment enhances community benefits in building projects

Community benefits are generally more readily achieved where the building owner has an aligned community-oriented mission, which was the case for all buildings evaluated in this analysis. Examples of mission alignment with the impact areas examined include: fostering a connection with and understanding of nature; emphasizing inclusion and equity; expanding awareness of ecology and sustainability; and community uplift through vocational training. Community Organization participants offered similar insights, emphasizing that in the context of building projects, community impact is significantly amplified when the building owner has a clearly defined vision and commitment from the start of the project.

2 An ecosystem mindset is key to integrating buildings with communities

The idea that buildings should foster connectivity and consider the characteristics of the surrounding ecosystem of a given impact area was a common theme in the recommendations from Community Organization participants. This has also emerged as a theme in parallel discussions within ILFI about other LBC impact areas including water and energy. Thinking of buildings as being woven into an existing ecological and human community rather than as isolated new additions or enhancements is a better reflection of reality and offers greater potential for community integration and resilience. Adopting this ecosystem mindset will also highlight opportunities for involvement or investment in existing local efforts, scaling impact beyond what can be achieved within the project boundary. The industry would benefit from guidance on how to realize this shift in perspective.

3 Social factors play a crucial role in enhancing community resilience

While community resilience typically involves considerations related to energy storage, water, or food, the findings suggest that it is worthwhile to examine how the definition of resilience can be enhanced to include social cohesion, mutual support, and community partnerships. This is particularly relevant to the experiences of community-based organizations, where the idea of resilience is closely tied to community solidarity and mutual aid.

4 Accessibility and inclusivity require tailored solutions for each community

As evidenced by the work of the community-based organizations as well as by many of the strategies used by the building projects, there are both needs and opportunities for ensuring accessibility and inclusivity throughout all impact areas. Accessibility can mean different things for different communities, and it is important to tailor solutions accordingly. This is an area for further development for the industry with the support of organizations like ILFI, to ensure that all aspects of a building and its programming are designed and implemented through a context-specific lens of accessibility and inclusivity.

5 Effective building projects integrate community engagement from the start

Conducting thoughtful engagement as early in the design process as possible is crucial. This is well-known in the practice of effectively integrating building systems, but the research findings also highlighted its importance for community-oriented aspects, such as community engagement, art, gathering spaces, and workforce development opportunities.

6 Achieving Living Building certification is a powerful motivator

Achieving Living certification makes a major public statement about the values of the building owner and can be a powerful motivator to ensure that the building continues to reflect the values of LBC in its ongoing operation, activities, and relationships.

ILFI is grateful for the opportunity to learn from the community of Pittsburgh and looking forward to integrating these learnings into future versions of the Living Building Challenge.

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