

Environmental and Social Impact Assessment of Alley Maintenance in the City of Detroit

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Advisor

Professor Mark Lindquist, ASLA, PhD

Client

The Village Community Development Corporation

Location

Detroit, Michigan

Project Period

February 2018 - April 2019

University of Michigan
School for Environment and Sustainability
Master of Landscape Architecture
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ABSTRACT

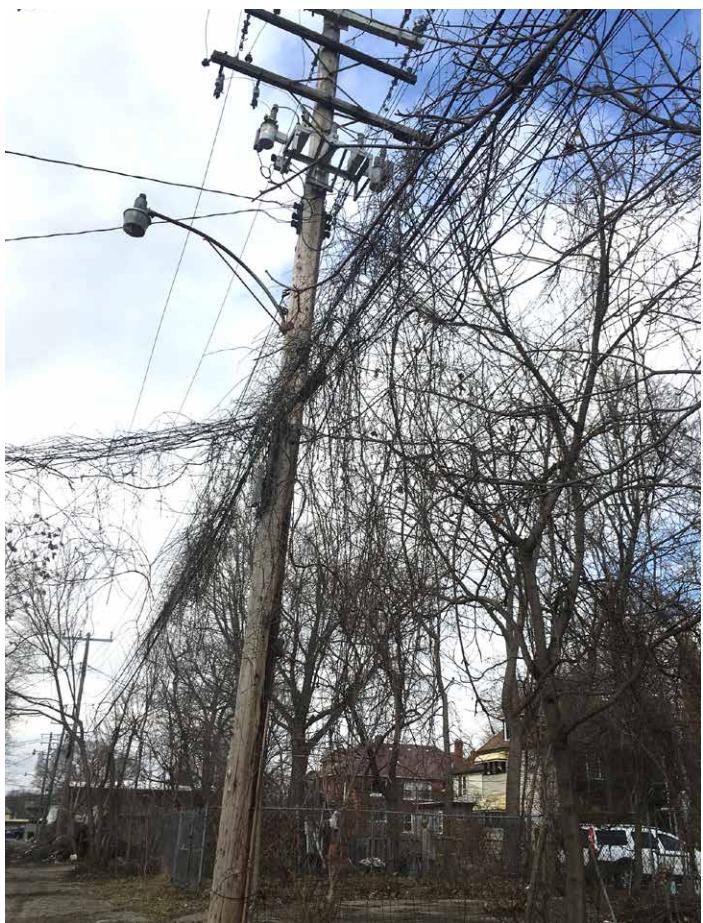
The city of Detroit suffered a significant decline since the 1950s. As the city continues to recover, development has spurred growth, particularly in the Villages of Detroit. The alleys in the city house essential utility systems such as: sewer, electric, phone systems. These areas have fallen into disrepair, erased through vacancy, or illicit activities. In addition, city infrastructure systems, some reaching capacity, are in need of repairs and attention by city officials. Through the course of this project, revelations about the city's complex infrastructure systems and governmental structure became apparent, as limitations were imposed on access to information, design restrictions, and new knowledge on stormwater systems.

The objective of this project is to understand and provide potential solutions to the use of the alley networks in the Villages of Detroit. By studying the role of alley infrastructure from case study cities, we gain an understanding of the alley potentials that use social and green interventions. At the site scale, we sought to understand the existing systems, opinions and uses by residents. Analysis and survey information from community members demonstrate a need to repair alleyways as residents continue to use alleys despite existing conditions. Developing sustainable interventions in a legacy city allowed the group to understand design barriers and the role of constant conversation among municipal partners and organizations. For instance, the placement of the storm sewer network within the depreciating alley network creates a barrier to the implementation of green infrastructure per the request of the Detroit Water and Sewer Department (DWSD). This constant

identification of blockades reconfigured this project from one of design interventions to designing towards policy tolerance and acceptance by location officials.

Our study focuses on developing potential solutions to answer these observations and provide a possible framework for the alleys of the Village in Detroit. This project sought to understand the Villages through a landscape design lens by analyzing the various dynamics that provide a sense of place. Explorations into case study cities like Chicago, Philadelphia, and current projects in Detroit, this project gained an understanding of the diverse potential of alley uses in contemporary design. This project also examined social components by analyzing the feedback from the community through an on-line survey. Our approached embraced social media as an inclusive platform to deliver community feedback. The current state of the alley network in the Villages ranges from non-existent due to vegetation to centers of commercial activities. Through this study, this project will provide potential interventions and support for alley revitalization, noting the feedback from the community organization, residents and the constraints identified by DWSD.

*Alleys from the Villages of Detroit. Housing essential infrastructures and used by local residents, these alleys are important social corridors that are rapidly falling into disrepair and require attention to safeguard these systems.
(Images 01-04 Source: Authors)*



INTRODUCTION

History

Since the post-WWII era, the notion of the alley has disappeared with the rise of suburbia (Martin 2001). Designers have recently sought to reactive these areas, seeing them as potential spaces improve neighborhood connectivity. Martin (2002) notes how these small areas and the proximity to homes, provides an opportunity to creative “active public recreation corridors”, while larger distances between homes limits community growth. Interest in alley re-purposing and green alley programs have been recently expanded, activating alleys as art, community, and green infrastructure spaces (Newell et al. 2012). Detroit, MI is considered to be a legacy city, having lost a significant amount of population since its peak in the 1950s (Mallach and Brachman 2013). Once a vibrant core of American Manufacturing, the city has lost a significant amount of its economic capacity, spurring significant job losses and increased vacancy. A city built for 2 million residents today is home to about 700,000. Vacancy has gathered significant attention and has been targeted as a needed improvement for cities to prosper. Alley networks have been perceived as hidden spaces that facilitate activities that are typically not accepted in parcel frontages (Martin 1996). As a hidden element of the city, alleys may suffer more indirect negligence by city officials concerned with housing occupancy and vacancy. The city of Detroit continues to receive attention and investment by developers proposing state of the art developments and building revitalizations, ignoring alleys and their historic use as community spaces (Martin 2002). This study focuses in the alleys of the Villages of Detroit, a vibrant and resilient community benefiting from increased investment. Highlights will include how

alleys are essential elements of the urban form as they house vital city infrastructure like stormwater and other utilities, but hold strategic social value through the uses of community members, making them important assets for the area and supporting a case for their continued maintenance and repair.

In cities like Chicago, where the alley network is an essential infrastructure for the entire city, alleys connect trash/recycling collection services, vehicular access to garage spaces, provide a sense of place through the multitude of housing entrances, and continued semi-private residential space. The purpose of alleys allows diverse interpretations. To New Urbanism, the alley can be described as a utilitarian space housing essential city infrastructures, vehicular storage, and other activities that are considered negative to the frontage of the home (Martin 2001). This thought is mostly true as the Detroit Alley system houses essential infrastructures such as: telecommunications, electricity, and storm sewer systems. Despite the image of the alley as a utility corridor, their evolution into social spaces has direct cultural influences on neighborhood residents and their personal uses (Martin 2001).

Aerials of Detroit from its peak in the 1950s to the current conditions. As seen from the aerials, the new vacancy condition is a contrast from the city's historical urban form.



(Images 05-06 Source: Detroit Historical Society, Google Earth)

Alleys as Social Spaces

Martin's (1996) Back-alley as Community Landscape provides a revealing picture of the cultural value alleys provide to communities. The alley provides a social seclusion space where activities that are typically not fitting of home front social norms flourish. These include socializing with neighbors, expressive decoration of back yards, an additional play space for children, extra residential storage capacity, performance of essential chores like car washing, and many others. The expansion of suburbanization deemed the alley as a waste of valuable land for limiting the size of parcels, effectively removing this social space from the new form of American cities (Martin 2000; 1996). Alleys take on roles that include three distinct categories: Hiddenness, Utility, and revealingness. Hiddenness applies to activities that are deemed inappropriate for parcel frontages. Utility refers to how spaces house essential infrastructures that support urban ways of life. Revealingness applies to the activities and choices residents partake to demonstrate care, expression, and ownership in the neighborhood.

Alleys as social spaces can be defined by four features: "flexibility in the establishment of outdoor personal space, provided within backyards; opportunity for "negotiated" semi-public connection with the small set of backyard neighbors, provided by the discreetly linking position of the back-back alley; "defensible" interface with the public realm, provided by the front yard and sidewalk; ... a dignified civic "streetscape" presence ..." (Martin 2002, pp. 147). Martin (2002) identified five typological patterns for modern alley uses and conditions. Streets without alleys - under this condition, streets are wider to maneuver essential services such as trash and recycling collections, distancing the cohesion of neighborhoods and removing the alley as a space for social gathering. Open-back neighborhoods - in this condition the backyard remains open and creates a pedestrian corridor space but still keeping essential vehicular activities in the frontage of the home and indirectly creating social norms for this space. Alleys without streets - similar to the structure of medieval cities, this typology seeks to mix pedestrian and vehicular activities. Streets and alleys, medium density - this conventional typology is typically found in cities like Chicago and Portland, where these spaces align with the geometry of a city and a distribution of recreational

spaces adorning the street equally. The use of these alleys also reflects concentrated residential activities towards the alley as opposed to the frontage of homes. Streets and alleys, higher density - in this condition the increase of density causes an increase vehicular access results in the construction of proper barriers between properties, thus limiting the alley's use as a social space but increasing the amount of expression by residents.

Alleys as social spaces provide residents with a collaborative activity space and results in essential community building support (Martin 2002). The alley provides an experience that allows permeability towards private spaces and constructs a neighborhood identity that is shared among the residents of a city block. Alleys particularly represent exciting potentials for areas that are park-poor as they can house essential social activities that contribute to community building (Wolch et al. 2010). Alleys have the potential to house multi-functional use and support public health, urban ecology, vehicular and pedestrian uses, and others. The importance of understanding social value in alleys is that revitalization of these essential social spaces result in positive impacts, both perceived and concrete, for local residents (Jiang et al. 2018; Seymour and Trindle 2015; Seymour et al. 2010). Understanding the social values of alleys will be essential towards the development of interventions proposed in this project, as these spaces will need to be community environments as well as housing essential utilities in Detroit.

The following pictures present different social conditions neighborhood alleys can house.



Image 07: The backalley becomes a source of neighborhood life.
(Source: Martin 2002, pp. 160)



Image 08: The use of the alley facilitates activities that are typically negative when seen in the frontage of homes. This makes the alley an additional space for semi-private activities.
(Source: Martin 2002, pp. 157)



Image 09: This alley in Ladd's Addition, Portland, supplies an additional space for recreation and perceived safety by the narrowness of the street.
(Source: Martin 2002, pp. 158)



Image 10: An "open block" alley provides space for non-vehicular traffic, creating a new green space corridor in subdivisions.
(Source: Martin 2002, pp. 154)

Alleys as Potential Green Infrastructures

The Chicago Green Alley Manual (2007) provides guidelines towards the greening of alleys. This manual has become a model for other cities as governments attempt to mitigate the effects in urban conditions, such as stormwater, the urban heat island effect, and others. Interventions in this manual list the potential benefits of Green Alleys, suggesting that their implementation improve stormwater runoff, reduce urban heat, reduce stress on gray water infrastructure systems, provides essential habitat corridors for urban fauna, increases flora diversity, improves air quality, and support neighborhood aesthetic beauty inside spaces that are typically used for utility services. Green Alley Programs are active endeavors in numerous American cities such as Chicago, Los Angeles, Baltimore, Seattle, and Washington. Green Alley Programs can see wide success if implemented with specific community goals that support essential attributes of sustainable planning (Newell et al. 2012). A multi-functional approach in Green Alleys can support various city endeavors like: stormwater management, urban heat island mitigation, increased safety, expansion of green space, community building, while also including features like permeable materials, interceptors, infiltration areas, light pollution reducing measures, and native and regional plantings. Newell et al. (2012) summarize specific criteria towards the implementation of Green Alley Programs: “1. The “program” is a designated program, pilot program, or initiative with multiple projects/pilot projects planned and/or executed. 2. The program represents the “core ideas” of green infrastructure – i.e., connectivity, multi-functionality, and “green.” 3. The program is intended to facilitate ongoing alley greening across a neighborhood, a city, or another spatial unit of urban geography. 4. The program’s literature explicitly states that it targets alleys. 5. Alleys are a major focal point rather than one target among many.” (pp. 3). Developing goals for Green Alley Programs facilitates implementation and goals in the development of a plan that can be both supportive of urban ecological systems and social structures in existing neighborhoods.



Image 11: Green Alleys provide a multi-functional approach with sustainability at its core. These places provide services for stormwater management, habitat, reduce urban heat island effect, and new social spaces for the neighborhood. (Source: National Association of City Transportation Officials)

Alleys + Urban Ecology

The presence of wildlife in urban environments is apparent as cities offer a wide array of support systems that address wildlife needs in cover, food, and water (Forman 2014). The extensive greenery found in urban environments may support essential patches, corridors and sources for certain organisms. Based on observations from respondents, Wolch et al. (2010) recorded observations of common wildlife use (birds, raccoons, snakes) and animal droppings from suspected strays or other urban fauna. This also suggest that alleyways may be frequently used by pet owners as walkways. Alleys, as an essential and present element in cities, thus construct the urban ecological frameworks of these systems. A perception from the greening of alleys has been the increase opportunities for new wildlife spaces and corridors, usually perceived by local residents as a positive of Alley Greening (Seymour et al. 2010). The robust incorporation of alleys in the urban forms of cities allows multiple opportunities to improve and supply ecological services (Wolch et al. 2010). These benefits include supporting vegetation in alleyways to improve wildlife flows, address impermeable material for stormwater infrastructure and urban heat island effect, and sustained connectivity corridors to green space and playscape. Park deficient areas can see opportunities via alleys as potential urban greenery that may benefit both urban wildlife and public health.



Image 12: The abundance of alleys adds more impervious surface to the urban environment. Their abundance allows an opportunity for new planting areas within the city. The addition of more plantings in these networks could potentially serve as networks for urban wildlife.
(Source: Green Garage Detroit)

Alleys + Stormwater Management

The role of green interventions in stormwater infrastructure can play a vital role in management systems. Stormwater pollutants can derive from dry aerial deposition, vehicles, commercial waste, industrial waste, construction sites, trash, animal waste, road salt, urban agriculture, lawn management practices, road material, thus picking up harmful materials that can be deposited into freshwater systems as well as entering local life systems (Forman 2014). Impervious surface and increased development run off further accelerates the transportation of these particulates. The use of green infrastructure has been thought of as a potential mitigation for the reduction of pollutant runoff in stormwater mitigation (Jaffe 2010). In addition, the role of green infrastructure for urban conditions has been associated with the removal of air pollutants as well as stormwater runoff in green roofs (Rowe 2011). The use of green infrastructure as a method to improve water quality must be further studied. Despite a consensus that green stormwater infrastructure improves water quality, the particulate matter that binds to soil and its effects to organisms within green interventions must be evaluated holistically to understand local runoff and propose proper interventions and their contextual impacts (Burton et al. 2018). Understanding the local urban ecology will help determine potential solutions to a Green Alley Program and following the 3 E's of Sustainable Planning: Environmental, Ethics, and Economics.

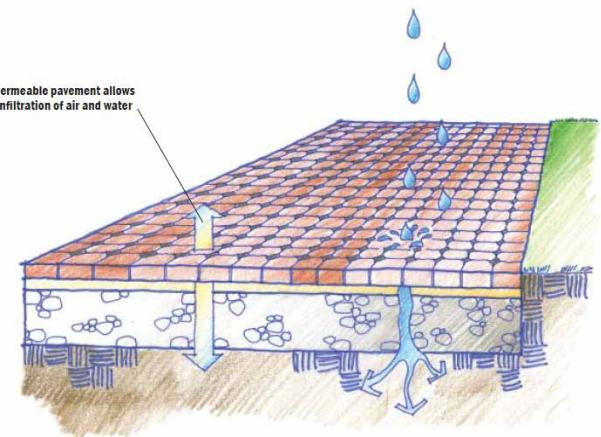
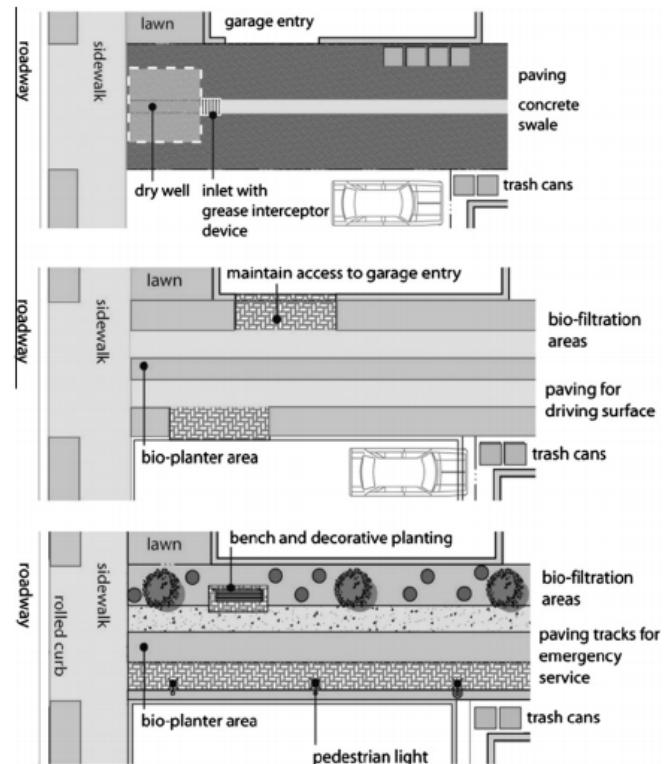
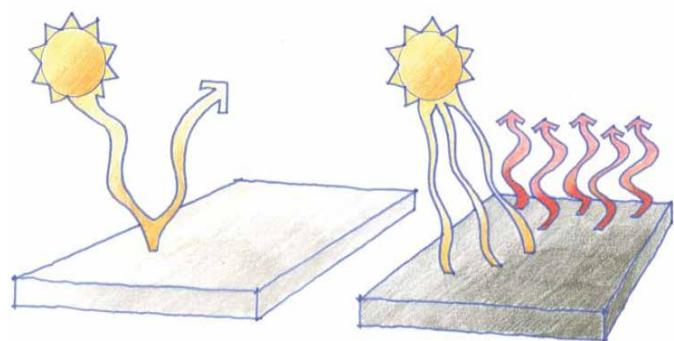
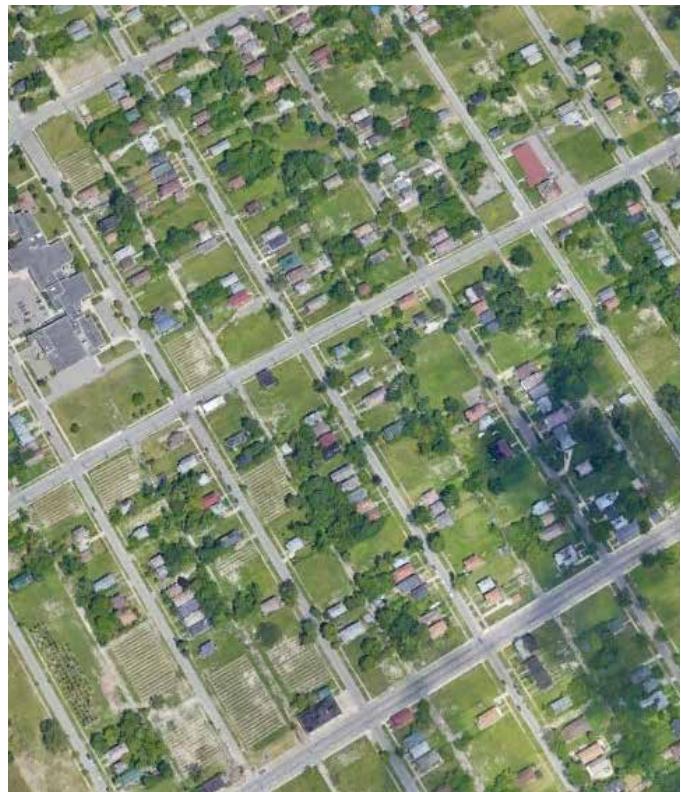


Image 13: (Top) The LA Green Alley Program provides multiple opportunities for stormwater management and a new community space.
(Source: Newell et al. 2012, pp. 150, AHBE Landscape Architects)

Image 14: (Bottom) Alleys as potential infiltration spaces.
(Source: Daley 2007, pp. 30)

Alleys + Climate Comfort

The role of alleys in the urban environment represent a significant portion of the a city's impervious surface. The amount of impervious surface can have direct consequences on the management of stormwater and the urban heat island (UHI) effect in cities (Forman 2014). Climate change adaptation in cities can take on a multifaceted approach where low albedo surface could improve UHI effects in cities and vegetative surface could increase stormwater capacity, habitat space and air moisture, making green infrastructure an overlapping concept to for social and ecological benefits (Larsen 2015). The use of paving material can have significant effects on impervious surface (Coseo and Larsen 2015). Another factor affecting bioclimatic conditions is neighborhood context and land use. Coseo and Larsen (2015) explain that landscape uses and covers can have different effects on heat sources and sinks in the urban heat island of Chicago. In their analysis, they noticed that temperature would increase by 0.62 degrees Celsius for every 10% impervious surface area and decreased by 0.32 degrees Celsius for every 10% increase in tree canopy.



High albedo pavement

Conventional pavement

Image 15: (Top) Diverse alley conditions provide areas with pavement and areas that have been erased to vegetation.
(Source: Google Earth)

Image 16: (Bottom) Alleys as potential UHI reduction. (Source: Daley 2007, pp. 10)

Alleys + Materials

According to the Chicago Green Alley Handbook, although alleys are originally designed to drain to nearby streets, over time many of the alleys have settled or been resurfaced to the point where they no longer drain properly. But the permeable pavements (permeable asphalt, concrete, and pavers) improve water quality by filtering the runoff and removing such pollutants as silt and debris. If they are installed where

poorly draining soils are the norm, the permeable pavements can be used with such subsurface systems as pipe underdrains or infiltration trenches to slow the flow of runoff and reduce the amount of stormwater entering the sewers (Landers, 2008).

Asphalt		Positives	<ul style="list-style-type: none"> Cools down and hardens fast. It can be used for driving and parking on the surface in about 1 day. Costs considerably less than concrete – typically between \$2 and \$5 per square foot. Has very flexible surface. It is designed to shrink and expand, so it is less impacted by extreme pressure, temperature, or surface movement. Very permeable. Water will pass through it and sink into the ground below it.
		Negatives	<ul style="list-style-type: none"> Can be damaged during extreme heat. When asphalt heats, it can become pliable and soft which causes indentations and marks. Maintaining an asphalt driveway is labor intensive. The driveway must be sealed about six to twelve months after installation. Then, it must be resealed every three to five years after that. The edges of an asphalt driveway tend to be less straight and neat than a concrete one.
Concrete		Positives	<ul style="list-style-type: none"> Lasts long. It lasts 20-40 years on average. Easier to customize to attain different colors, styles, and textures. Has neat, straight edge.
		Negatives	<ul style="list-style-type: none"> Requires a week to cure. Due to the high moisture content in new concrete, a freshly poured driveway must cure for seven days before it can withstand the weight of a vehicle. Holes or cracks can't be simply patched. It cannot be resurfaced. The costs of concrete roads are also higher than that of asphalt, both in installation and repair. Will crack in very cold weather.
Brick Pavers		Positives	<ul style="list-style-type: none"> The color of brick pavers is not going to fade or change over time. Brick maintains its coloring exceptionally well, much better than concrete, even when exposed to the sun. Remain durable without a whole lot of maintenance. Clay bricks are highly resistant to stains and other issues, meaning you will spend less time and money maintaining brick pavers. Have remained in style for centuries and continue to remain timeless in appearance.
		Negatives	<ul style="list-style-type: none"> Tend to cost about 15% to 20% more than concrete pavers. Installation of pavers is a bit more detailed and requires proper planning, excavation, and grading. Once that is done, the pavers will be laid, and polymer sand or another type of adhesive-like material will be used to join the pavers. Do not tend to crack, but they can loosen over time. When that happens, it can become a hazard, and it will be needed to replace the individual paver.

Chart 01: Asphalt pavement is a mix of stones, sand, and liquid asphalt cement. Concrete is gravel that is mixed with water and cement. Brick pavers are technically made from real brick, which is formed from clay and baked at high temperatures in a kiln.
 (Source: <https://www.fixr.com/comparisons/asphalt-vs-concrete-driveway>
<https://www.fixr.com/comparisons/pavers-vs-concrete>)

Green Alleys + Social Perceptions

As stated before, alley maintenance priorities for residents place safety as a top choice. Martin (1995) explained how alleys allowed a platform for activities that typically do not meet the expectations of frontages. This also results in the assumed perception that conventional alleys housing essential utilities and logistics may not be perceived as welcoming by pedestrians. Jiang et al. (2018) found that urban function interventions, such as events, dining, and prescribed sitting areas, had a greater improvement of perceived safety over cleaning or vegetation interventions in alleys. Local residents saw that green parklet interventions or the use of a dining/shopping experiences as a greater increase in safety than cleanliness or unprogrammed vegetative spaces. All proposed interventions were perceived as an improvement in safety.

As a legacy, post-industrial city, vacancy in Detroit is a common occurrence. Vacancy can have ecological and social benefits if properly addressed. Nassauer and Raskin (2014) provide important issues relating to the perceptions of urban nature achieved by the image of vacant land that was “returned” to nature. Social perceptions of vacancy extend to a sense of pieced danger or lack of care by the community, making residents vulnerable and affecting safety and public health. Similarly, the perceived idea of an ecological service misses the built legacy in the landscape and the distributions that occurred during and after use in the ecosystem. As alley systems have fallen “Back to nature,” considerations for its environmental legacy and the effects on social perceptions within the vacant context are essential for sustainable futures.



Image 17: Alleys conditions and improvements test how individuals perceive safety in the environment testing two psychological theories: Broken Windows and Routine Activity Theory, suggesting that improvement in these conditions can be based on certain interventions.
(Source: Jiang et al. 2018, pp. 7)

Why do Alleys Matter?

Seymour et al. (2009) analyzed the perceptions of alleys in Los Angeles. The location of these alleys are in predominant communities of color and towards more of an economic disadvantage. By surveying perceptions on alleys, Seymour et al. (2010) found a common need to improve alley safety, cleanliness, and aesthetics. Residents favored interventions that facilitated their uses of the alleys, such as shortcuts, storage, and infrequent use of recreational space, while also expressing a desire for safer community spaces for play and interventions to deter negative activities. In more active, commercial settings, alley revitalization for pedestrians has supported increased foot traffic and social activities compared to conventional usage (Seymour and Trindle, 2015). The Los Angeles Green Alley program was a multi-organization project that proposed interventions that provided essential functionals while supporting essential social services, such as community interaction during and after the project completion. Newell et al. (2012) states how the Los Angeles Green Alley Program sought to improve urban conditions and increase recreation and social connections throughout the neighborhood, while focusing on the desirable objectives of a specialized subcommittee.

The use of green infrastructure as a multi-functional intervention can be a source of resilience for cities (Lovell and Taylor, 2013). The use of green infrastructure can improve plant biodiversity, leading to increase habitat space, micro-climate control, potential stormwater management and serve as an aesthetic elements for visual preferences by residents, potentially improving social frameworks and public health. In addition, the development of green infrastructure as multi-functional green infrastructure has been based on goals for stormwater management instead of placing needed emphases on socio-economic and environmental benefits (Meerow and Newell 2017). The role of green stormwater infrastructure could provide cultural benefits such as neighborhood spatial cohesion through increased and maintained green space, regulation of the urban climatic conditions, and an increase in habitat connectivity for the urban ecological matrix. As capillaries within the urban form of cities, alleys represent an opportunity to function as social and ecological corridors.

Legacy cities, like Detroit, have suffered significant decline and increased vacancy, potentially leaving small pockets of residents within swaths of empty land. Detroit suffered a population decline greater than fifty percent, making the contemporary city of 700,000 fit within a historic urban form built for two million (US Census, 2010, 1995). As hidden elements of the urban form, alleys in the Detroit are in various conditions from erased through vegetation to active and vibrant cultural assets. Alleys support many of the city's essential infrastructure and letting them fall into disrepair increases vulnerabilities. Already in need of essential repairs, alley networks in the 21st century have the potential to serve as multi-functional systems providing social and ecological benefits.

Detroit Alleys are considered to be "public right of way", they are "mini roads" and thus should be given equal attention. Alleys provide above and below ground easement including housing essential city infrastructure services of electrical, communications, sewer, and natural gas utilities. As the city of Detroit continues to see rapid investment in new development, alleys are neglected areas of the city, resulting in disrepair, closure, potential environmental degradation, and vacancy as the city continues to recover from economic catastrophe. The case of alleys represents new opportunities for community and spaces for neighborhood enrichment (Martin 2001). The Villages of Detroit, situated in the northeast side of the city, have alleys that differ in condition from erased by vegetation to actively used. Continued lack of maintenance and repair has sparked community concerns about the future use of these spaces.



Image 18: *Flower Day*, Ouizi - West Village (Source: City of Detroit)

Why Study the Alleys?

This study's goal is to provide potential interventions to the maintenance and improvements to the alley network in the Villages (Barry Subdivision, East Village, West Village, Indian Village, Islandview, Gold Coast) of Detroit. Since the beginning of the Post-Industrial Age, the city of Detroit has suffered a significant decline in population, leading to infrastructural neglect and large swaths of vacancy. As a city with miles of alleys, already a neglected urban typology, disrepair has become rampant, ranging from initial signs of needed improvement to erased by vegetation. Essential networks for the city, housing vital utilities and stormwater infrastructure, there is a need to address such a large part of the city. The Villages of Detroit have seen increased investment and stability exciting street fronts, but leaving alley networks to decline despite new economic growth. While understanding the constraints imposed by the urban ecology and the Detroit Water and Sewer Department, this study will propose potential interventions to the alley network that supports utility systems and the uses and desire of local residents, becoming a multi-functional network for resiliency.

THE VILLAGES OF DETROIT

The Villages area of Detroit consists of 6 neighborhoods: Barry Subdivision, East Village, West Village, Indian Village, Islandview, Gold Coast. As a vibrant area of the city, growing in commerce and community institution, the need to address sustainable development has become an important issue for its residents and advocates. Our client, The Village Community Development Corporation, has made it its mission to develop and develop its community, focusing on sustainability. While the area is recognized for its historic and diverse architecture, the effects of the city's decline has been detrimental to its alleys, housing the region's important infrastructure. The need to focus on the area's alleys has been driven not just by the client, but through a community effort to provide attention towards a more cohesive, equitable neighborhood.

The Villages of Detroit are part of the ECO-D, a city-based organization with a goal to foster neighborhood-level sustainability. The ECO-D organization focuses on three important principles: equity, climate protection, and resilience. Aligned with the principles of the ECODistrict Protocol, which focuses in supporting neighborhood-led sustainability, ECO-D has led efforts for urban sustainability in the West Village area of the Villages. The West Village of Detroit has begun efforts to foster neighborhood sustainability by the implementation of a Sustainability Committee to support stakeholder engagement towards the mission of ECO-D. Projects completed in this neighborhood include: community garden spaces, urban agriculture, Alley Solar and Green Projects.

As the neighborhoods continues to expand its vibrancy, the need to address alleys has become more important. Driven by the participation of the community and the efforts by individuals, organizations, and the city, the need to expand and mend the role of alleys is a priority for our client and citizens, and a potential example as a way to address the miles of alleys that meander the city. Alleys areas have a legacy of being ignored (Ford 2001), operating as part of the invisible infrastructure that provides the city's valuable utility resources. The Detroit alleys neglect provides an opportunity for the community to learn about the value of these spaces and allow the city to focus on providing a sustainable infrastructure system that steers the city towards a strong recovery.

The Villages Community Development Corporation (CDC) is non-for profit organization with the mission to accelerated economic development in the Villages of Detroit. The organization supports the following neighborhoods in Southeast Detroit: Berry Subdivision, East Village, Gold Coast, Indian Village, Islandview, and the West Village. This area of the city is strategically located on the banks of the Detroit River, within 2 miles of the Downtown, neighbors Belle Isle, accessible to Greenways like the Dequindre Cut, and remains as a stable part of the city. The Villages of Detroit CDC focuses on numerous endeavors that support retail residential development, placemaking, and collaborations with other community organizations.

The Villages • Detroit



Image 19: The Villages are located by Belle Isle on the riverside of the Detroit River, minutes away from the Downtown Area. (Source: Google Earth)

The Future of the Villages

The Villages of Detroit represent a dynamic area of the city. New developments and investment are increasingly adding attention to the villages.

PARKER DURAND

West Village

- Affordable Housing Development
- 92 Housing Units
- Green Streetscape
- Mixed-Use Development with Ground floor Retail + Parking Locations
- Source: Hamilton Anderson Associates + Detroit Curbed

(Image 20 Source: City of Detroit)



City Requests for Proposals

Islandview

- RFPs issued for 16 mixed-income communities
- Enhancement to Streetscapes and local park, Butzel Play field
- Part of Strategic Neighborhood Fund
- Source: Detroit Curbed + City of Detroit

(Images 21-23 Source: City of Detroit)





Image 24: In the West Village, Alleys are used as important neighborhood connectors to residences. As seen from the photo, the state of the paving material is in poor condition. (Source: Authors)

How to Address the Future of Development in the Villages

This project is uniquely situated as interest in alleys at the neighborhood scale has not been approached in the city of Detroit. As a city with a multitude of alleys, sustainable growth in Detroit must develop a plan for incorporating these urban elements within the new development prompt by incoming investment. The evaluation framework for this project will be adapted to the needs identified through experience of the site and the client requirements. The plan is to consider a scenario approach that will test different possibilities for alley projects based on devised parameters from the research. Understanding that the Villages are a dynamic area of the city, this project will provide important supporting data for alley redevelopment and maintenance improvements. The project will take on a multifaceted approach understanding the cultural, ecological, and infrastructural values of the alley network to develop comprehensive ideas and supporting information towards sustainable neighborhood developments.

METHODS

This project focused on a combination of approaches to address our project goals. In order to better understand the alley situation found in the Villages of Detroit, a multi-scalar approach was needed. This study uses the following methods to understand conditions and provide suitable solutions:

- SITE ANALYSIS: site visitations to the Villages, understanding cultural and contextual inventories and developments,
- DATA COLLECTION + INVENTORY: an analysis of existing GIS Data followed by the collection of information gaps through aerial imagery,
- CASE STUDIES: learning from existing case studies,
- COMMUNITY ENGAGEMENT: surveying residents of the community through social platforms,
- RECOMMENDATIONS: proving and testing alley space typologies based on analysis and community feedback.

Site Analysis

The Villages of Detroit share a unique history and urban environment distinct from other areas of the city. The site analysis will allow to experience the site, document findings, such as community aesthetic and existing conditions of the alleys, understand the value of the neighborhood as guided by the clients, and allow the potential to re-imagine these places to help guide goals and indicators for our project success. This project accounts the existing conditions found in the alleys of the Villages through photo documentation, assessing cultural and ecological value. In addition, the site analysis will also examine changing conditions in the neighborhood, such as construction development and trends in the Villages.

Inventory + Experience

Visits to the alleys of the Villages documented existing conditions and their relation to the context of neighborhoods, such as commercial corridors and uses (parking, logistics access, and others). This approach incorporated the use of site photos within areas of greater occupancy, such as Indian and West Villages. With an area of over 1,800 acres, the team utilized high-definition aerial footage provided by the NearMap service. Understanding the observed uses of alley spaces in the alley would provide insight into how the community may value these urban elements and how to best target our survey development. The use of aerial imagery allows the analysis of alley conditions at a greater scale including identifying alleys that have been erased through the demolition programs or those who have been converted by poorly managed vegetation.

Developments and Changes

The importance of understanding neighborhood development events, such as new construction, re-purposing, streetscape projects, and other investments, allows the project to determine the level of alley inclusion for the future of the Villages. Alleys are hidden elements of the urban environment, facilitating essential social and logistic activities. An assumption can be inferred that new development would not recognize these alley networks and thus continuing to their decline. By researching publications like Crains - Detroit and online real estate development sources, development information and digital representations

could be obtained to inform the use of alleys in future development.

Case Studies

Martin (2001) explains how alleys were conventionally used in the development of cities, and elements which have been lost in the post-WWII suburbanization movement but have received increased attention by new urbanists. Detroit's miles of alleyways provide numerous opportunities for typological interventions ranging from ecological to social proposals. In this project, the following cities were used as Case Studies for their progressive approach to alley usage, historic elements within an urban context, and a new programming approach towards the activation of these largely neglected places. The city of Chicago was chosen for its pioneering approach of green alley developments through its Green Alley Handbook (Daley 2007) and its innovative new programming and tactical design interventions of small spaces, like alleys and places underneath the 'L' train system. The city of Philadelphia was chosen for its historic use of alleys that have become an icon in the old city neighborhood in addition to its proposals for new green infrastructure projects and tactical urbanism displays such as the Pearl Street Alley. Finally, the city of Detroit was chosen, particularly in the Downtown and Midtown Areas, for the intervention by local organizations to develop green and programmed alleys that have activated these places as destinations.

Data Collection + Information

Through the use of G.I.S. data sources from the City of Detroit, the US Census, the State of Michigan, SEMCOG, Michigan Department of Environmental Quality, and data creation using aerial imagery provided by Near Map, essential spatial data was captured to understand the conditions of the Alley Networks at the neighborhood, city, and regional scale. This understanding of scale was important towards the development sustainable solutions that incorporate the many facets of the area. This study provided the important gaps in existing sources. These gaps included: condition and presence of alleys, location of important stormwater infrastructure systems, and soil conditions and tolerance of interventions.

The use of this data was essential to understanding the following research questions:

- Demographic Information Relating to: Economic Distribution, Racial and Cultural Makeup of Neighborhoods, Occupancy and Vacancy Status of Built Structures
- Built Environment Relating to Existing Structures in Relation Vacancy
- Alley Conditions and Infrastructure Context: Location and Condition of Alleys, Location of Stormwater Infrastructure, Analysis of city 311 Calls Received to Determine Greatest Issues
- Urban Ecological Attributes: Soil Classification and Potentials for the Implementation of Green Stormwater Infrastructure, Presence of Flooding, Existing Sources of Pollution with the Neighborhood Context

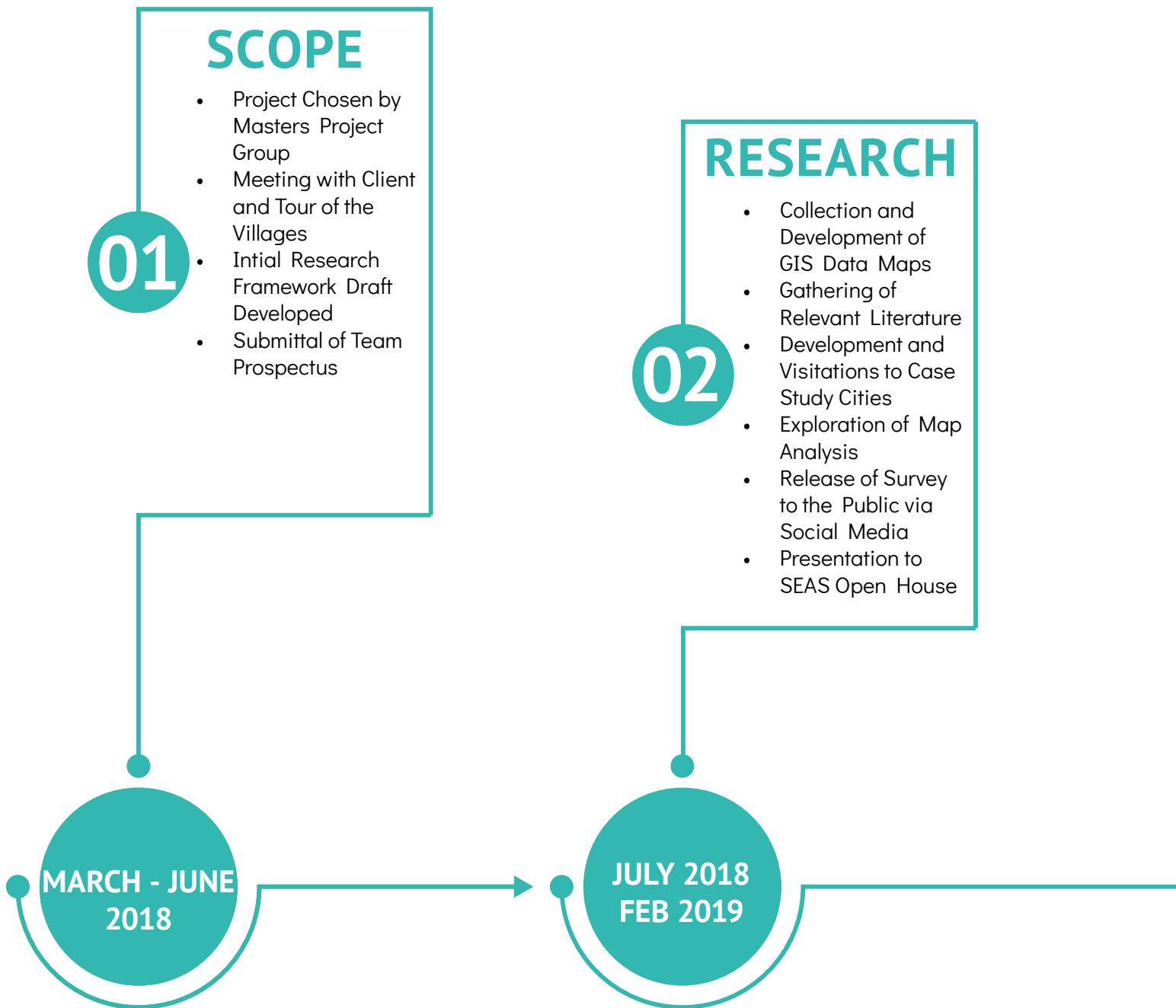
Community Engagement

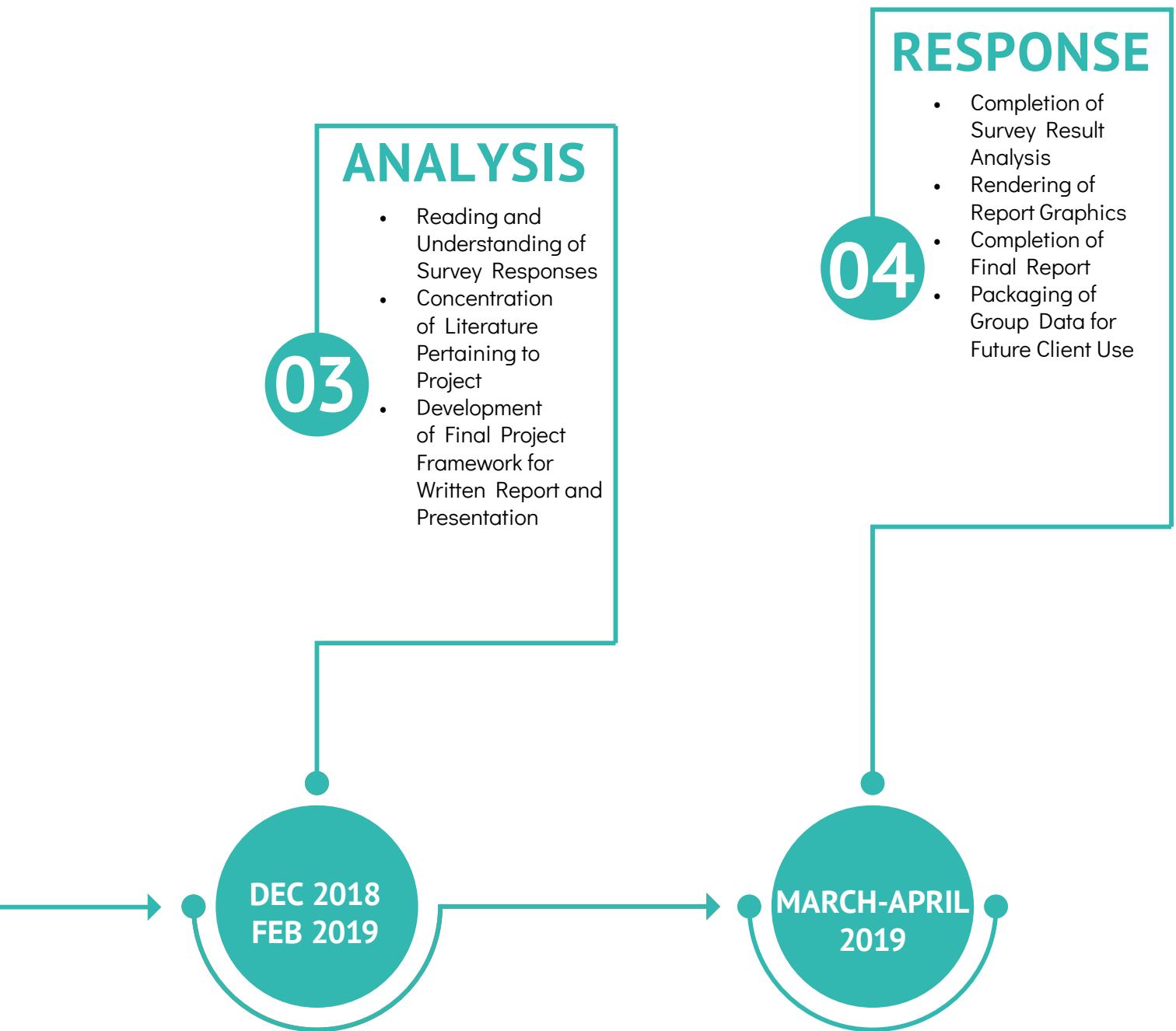
In order to receive community feedback, a survey was developed to understand local uses of alleys in the Villages while asking surveyees for recommendations and alley typological preferences. Through the use of social media, the survey was distributed across the client's social media platforms to allow a more inclusive, accessible approach for the community.

Recommendations

After analyzing existing and new data and receiving feedback from local residents, the project developed potential typological interventions that address the possible scenarios of common alley types found. Alley typologies will address the following locations categories: Within Occupied Residential Areas, Within Moderated Vacancy Residential Areas, Near Commercial Hubs, Vegetation Domination and Completely Vacant Blocks.

PROJECT TIMELINE

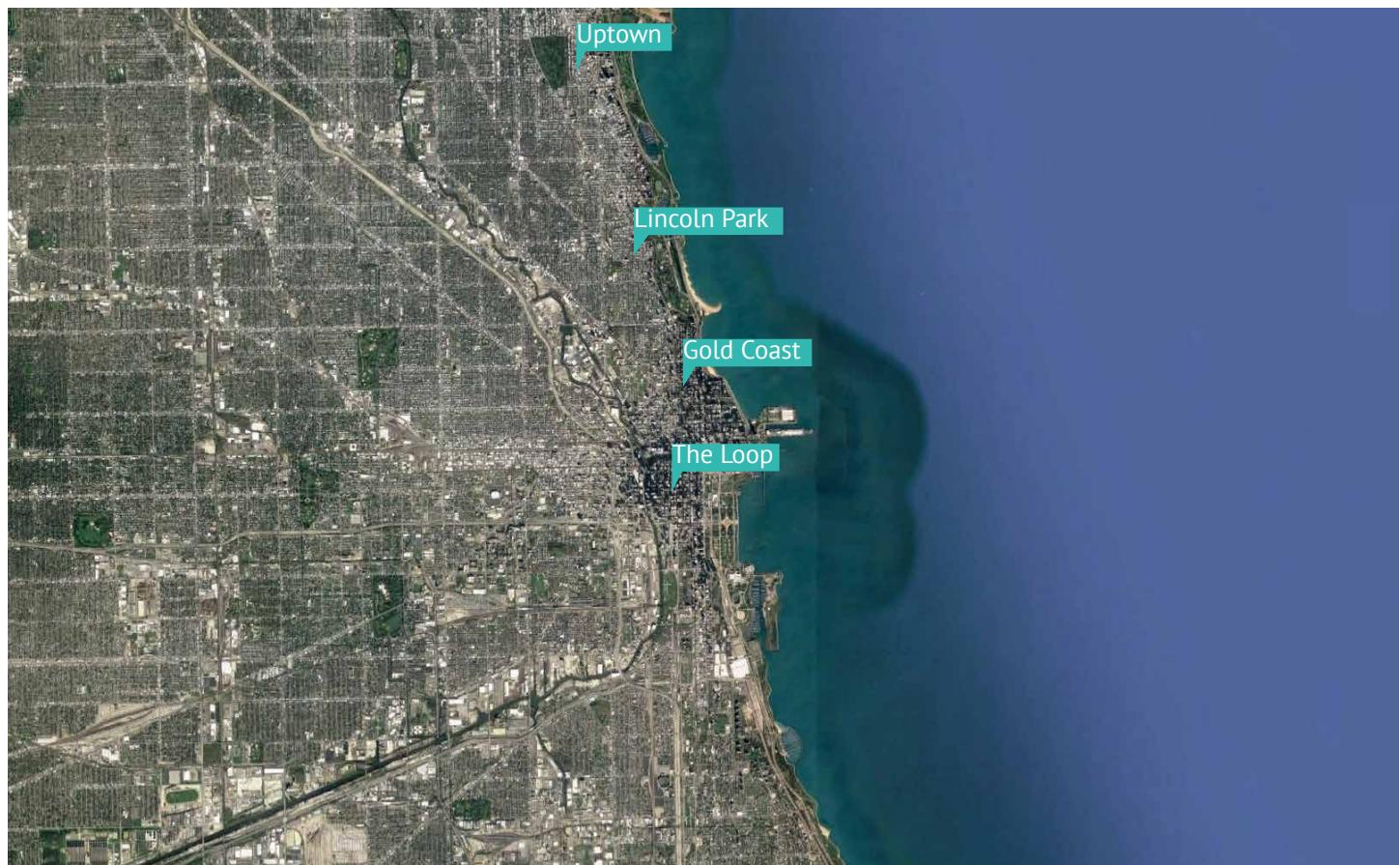




Map 01: Project Timeline

CASE STUDIES

Chicago, IL



Date: August 31, 2018 to September 3, 2018

Locations: Loop, Lincoln Park, Uptown, Lakeview/Roscoe Village, Wicker Park/Bucktown

Organizations: Port Urbanism (Design Firm, Expertise in Activating Small Space), Chicago Loop Alliance (Planning for Public Spaces in the Chicago Loop)

(Image 25 Source: Google Earth)



(Image 26 Source: linkedin.com)

Introduction

As hidden elements of American Cities, alleys have been forgotten or neglected from resident images of their cities. The alley has risen from a forgotten element to a traditional feature of urban cities as their purposes have been integrated into the daily lives of residents (Wolch et. al 2010). Chicago, with over 1,900 miles (3,000 km) of alleys, utilizes alleys to facilitate trash and recycling collection, access vehicular spaces, and other residential amenities. The alleys of Chicago, covering over 90 percent of the urban grid, represent a cultural landscape that is actively used by residents, per this study's observations. Historically, the alleys not only provide needed logistical infrastructure for the city, but their purpose has extended to the construction of valuable social spaces promoting a sense of community (Martin 1996). The purpose of this case study visit to Chicago was to determine how alleys provide social function over essential city infrastructures. Our observations accounted various trends in alley usage from access to dwellings to play spaces to work spaces.

Guidelines and Regulations of a Green Alley Program

The city of Chicago has shown considerable interests in refurbishing alleys through the implementation of greener guidelines to combat stormwater runoff and the urban heat island effect (Attarian 2010). In addition, the city has taken these actions to combat the new extremities that will be achieved through climate

change, which will affect the city by an increasing number of days over 32 degrees Celsius and create more vulnerability for heat-related deaths (Hayhoe et al. 2010). In 2007, the administration of then Mayor Richard Daley, the city developed the Chicago Green Alley Handbook to mitigate the stress on its combined sewer system. Through these handbook, the city provide regulations and guidelines to mitigate stormwater and urban heat island effects. The Green Alley Program focused on a concept of reducing stormwater water runoff from about 80% of impervious surfaces, mitigate the city's pressing urban heat island effect, addressing ideas in material recycling and consumption, and using energy conservation and glare reduction techniques for cost effectiveness and safety improvements in these corridors.

Chicago's reliance on alleyways places significant care, as they are the capillaries for background logistics such as trash collection and garage access. As seen from images [28-30], the flow of stormwater diagrams essential movements to protect the neighborhood context. The selected neighborhood context demonstrates essential living areas, such as garages and private yards, and their proximity to these infrastructures. The development of the city's urban form makes these corridors part of the cultural built environment as they are an essential connector to homes and perceived public space. The vast network of alley surface has created these conditions of increased runoff and increased albedo effect throughout the city. The manual suggest materials that help mitigate these issues. The recommended use of permeable pavers, concrete, and asphalt would benefit

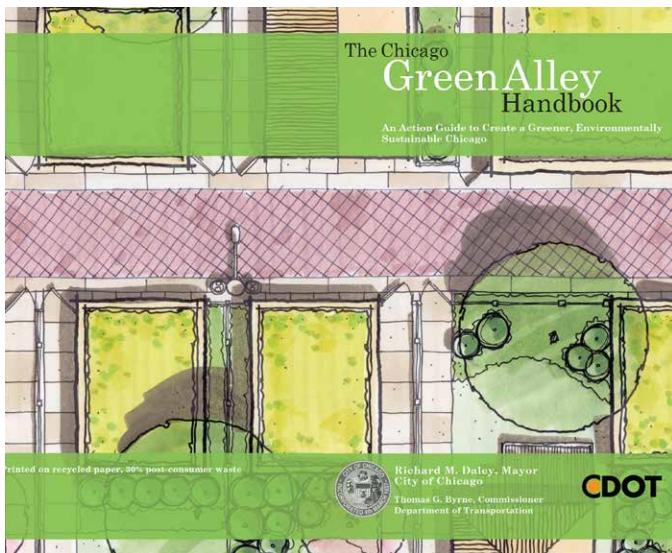


Image 27: The Chicago Green Alley Handbook, provides important material on the innovative endeavour of green alleys, including listing benefits, issues, and materials and costs. (Source: Daley 2007, Cover)

the city's stormwater infrastructure system by reducing the rate and quantity of flow, add to the recharge of groundwater, and provide a filter system for particulate matter. The multi-functional use of materials would mitigate the high-albedo conventional pavement by suggesting material that is light in color to reflect sunlight and lower heat absorption, thus improving bioclimatic conditions, energy conservation, and air quality. Material choices are noted to determine a role on life cycle processes as selections will be required to reduce construction contribution to landfills and the extraction of materials to improve cost effectiveness.

The Chicago Green Alley Handbook addresses the need to increase the urban vegetation for ecological and social reasons. The use of increased vegetation is addressed as a potential for infiltration areas that would be cost effective, while also reducing the urban heat island effect. Vegetation is recommended to combat bioclimatic event such as reducing energy based on its location. Other improvements include potential habitat areas for urban wildlife, using local vegetation to decrease maintenance costs, an improvement to air quality, soil structure, filter particulates and pollutants, a reduction of localized flooding, and accessible neighborhood green space. The handbook addresses the potential for interventions at neighborhood scales. The implementation of green alley practices at the neighborhood scales adds various components that address runoff from all impervious surfaces, the potential flows of particulate matter and pollutants

from these resources, the mitigation benefits that improve the bioclimatic comfort and protects areas from stormwater issues.

Criticism

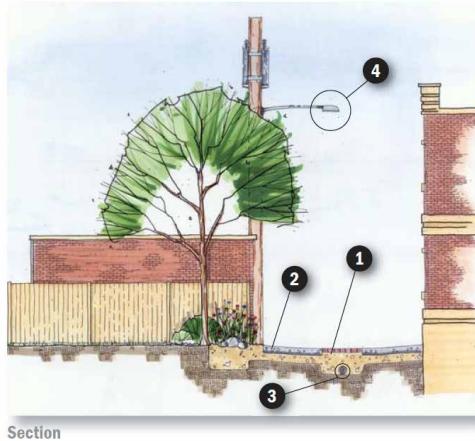
The use of alternative material for stormwater water management may have trade-offs as it is used to refurbish Detroit Alleyways. Permeable material systems such as [permeable] pavers, concrete and asphalt have shown to be successful in removing particulates and toxins by filtering runoff, reducing stress on sewer systems, and ultimately improve water quality (Nnadi et al. 2015). Issues from permeable material will be impacted based on surrounding context such as the proximity to vegetation, as the use of reflective paver material can have increases in air temperatures unless in proximity to urban canopy (Coseo and Larsen 2015; 2014). Coseo and Larsen (2014) determined that the city of Chicago experiences a decrease in temperature of about 0.35 degrees Celsius for every 10% of tree canopy, while the use of pervious pavement actually had an increase in air temperatures. The material choices for further Green Alley projects will have to realize a configuration that address multiple factors for a sustainable plan. Factors such as effectiveness of permeability, effects to the urban climate, and the support of social and ecological services will need to be addressed.

1 Permeable pavement material (permeable asphalt, permeable concrete, or permeable pavers)

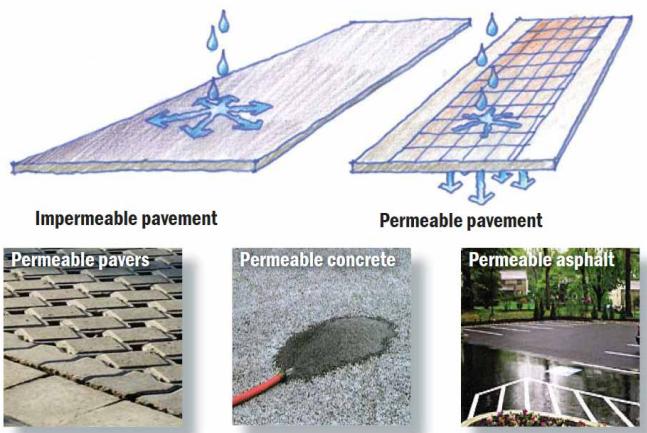
2 High albedo concrete paving with recycled aggregate and slag

3 Optional pipe under drain

4 Energy efficient dark sky compliant light fixture



Technique 2: Permeable Pavement



The presentation of the Chicago Green Alley Handbook provides a more transparent guide to inform stakeholder groups. Through this approach, the city can educate the public on needed interventions to address persistent issues within visible infrastructures like alleys. By providing clear examples and a list of benefits, the city can communicate the importance of these recommendations. The use of cost estimates inform citizens the true cost of green alley projects, but fail to signify their overall financial benefit to conventional practices. Developing a model that provides the cost benefits to citizens increases the social acceptance of initiatives by the city (Vandermeulen et al. 2011). The handbook also fails to address the negative issues or low functionality of some proposed recommendations. As a reference for the guidelines and recommendations applied to this project, this handbook provides a foundation and allows this study to see the success of these projects seen during the case study city visit.

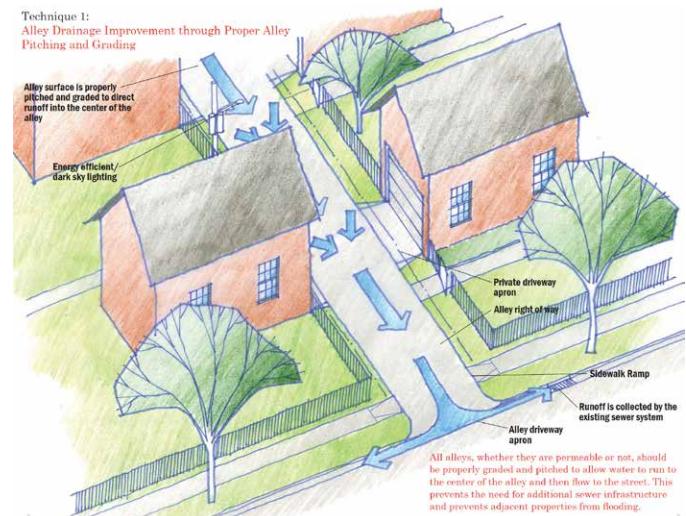


Image 28 (Top Left), 29 (Top Right), 30 (Bottom): The manual provides examples of interventions. This includes materials, stormwater systems, and construction processes in a transparent communication.
(Source: Daley 2007, pp. 9, 11, 19)

SITE LOCATIONS

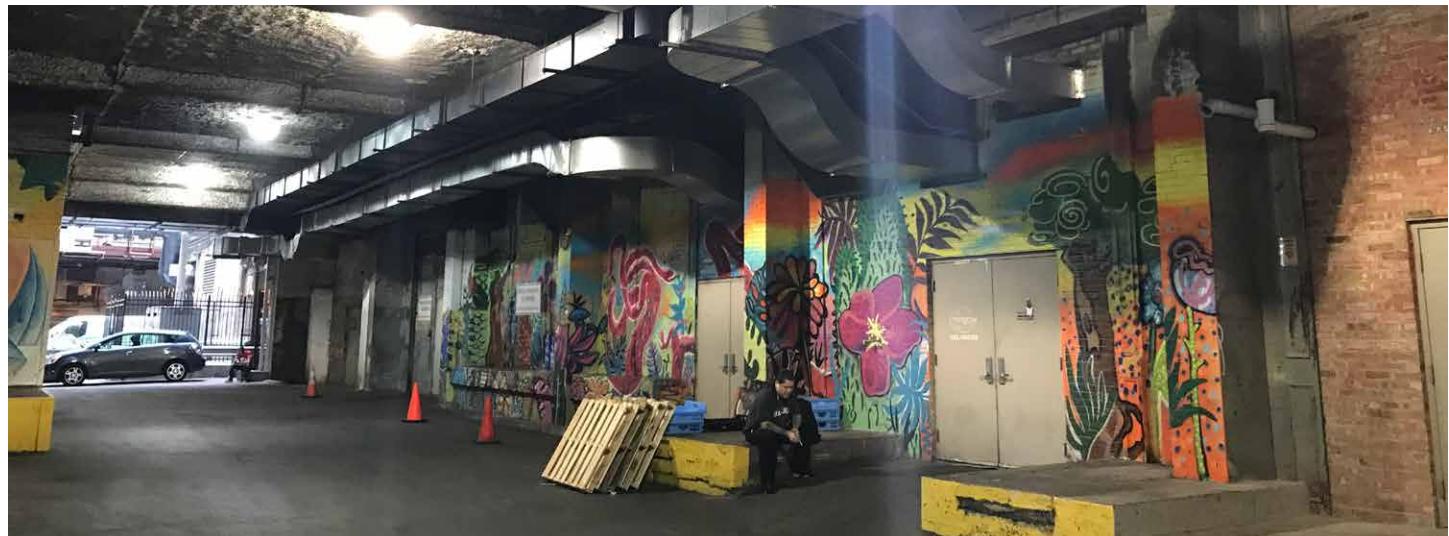
THE LOOP

Chicago's loop neighborhood is the confluence of the city's "L" system in addition to the business center for the region. Like many downtown areas in the American Cities, the Loop has remained largely a dense commercial zone. Recently, the neighborhood has been re-developed to allow mixed-use residential areas. The Chicago Loop Alliance has spearheaded events throughout the neighborhood to promote after work activities. Through its ACTIVATE series, the organization has revitalized the ignored alleys of the loop as social and art events.

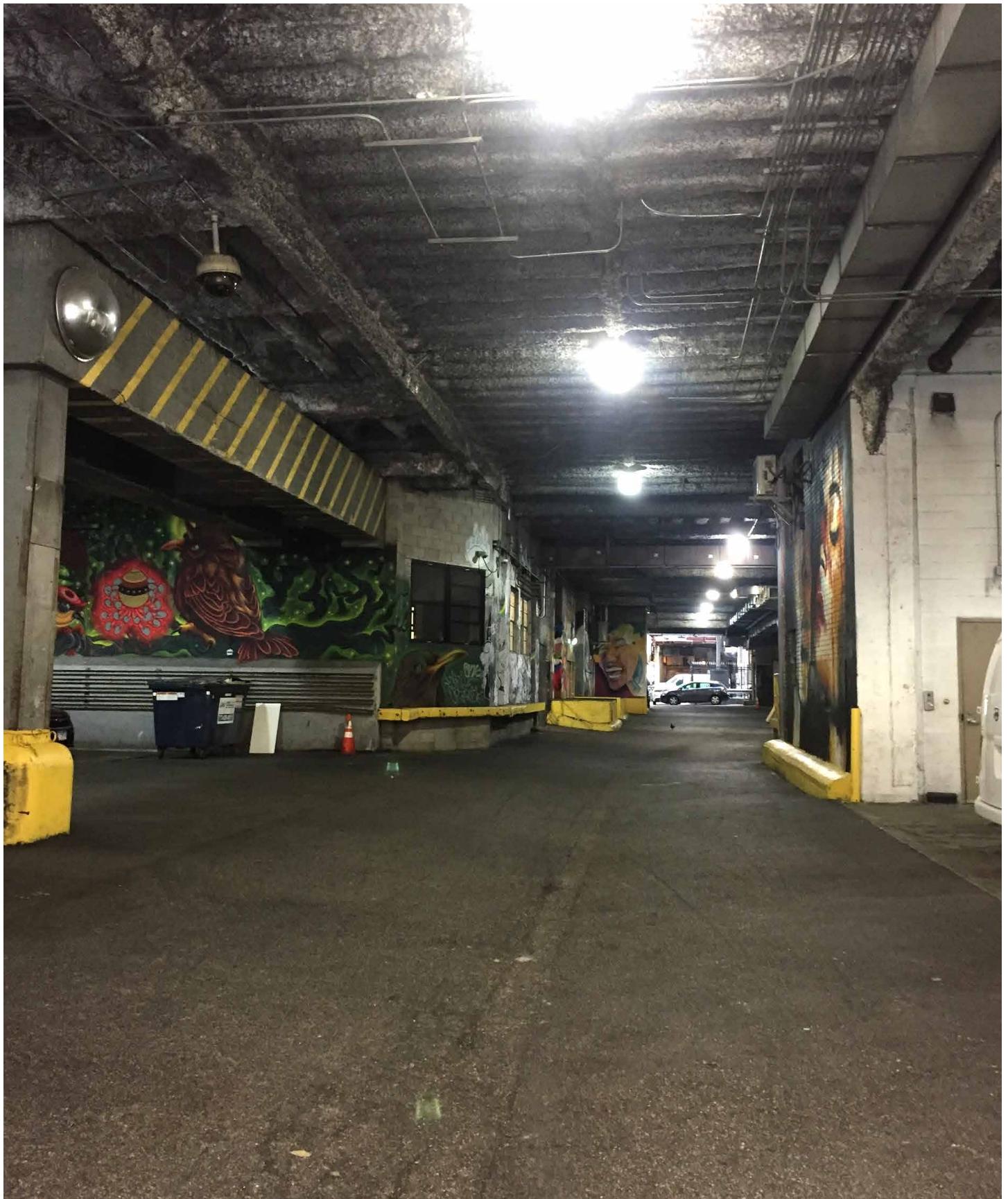
Sullivan Center Alley (16 E Monroe)

The Alley of Murals. Housed underneath skyscrapers, this service alley has been transformed by murals covering its walls. Used as a typical parking lot and loading area, the observations include: people on their smoke break, storage of loading equipment, and the noise of working HVAC equipment.

Despite these typically negative activities, the alley was also used as a gathering space for conversations from individuals who were possible workers of the enclosing skyscrapers. In addition, the alley's connection to the next major street was used as a corridor for commuters while other visitors would photograph the art after noticing the oddities from the street. The redefinition of this alley focused on its activation as a social space rather than its infrastructural systems. The Chicago Loop Alliance has used this space for summer events during its ACTIVATE Series.

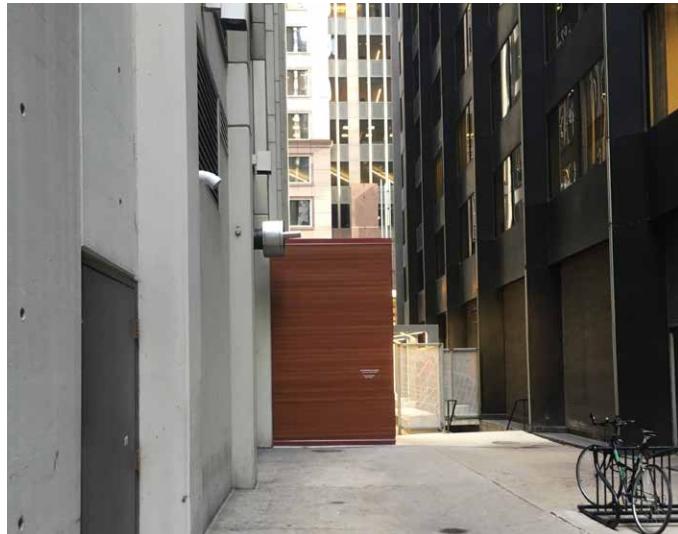
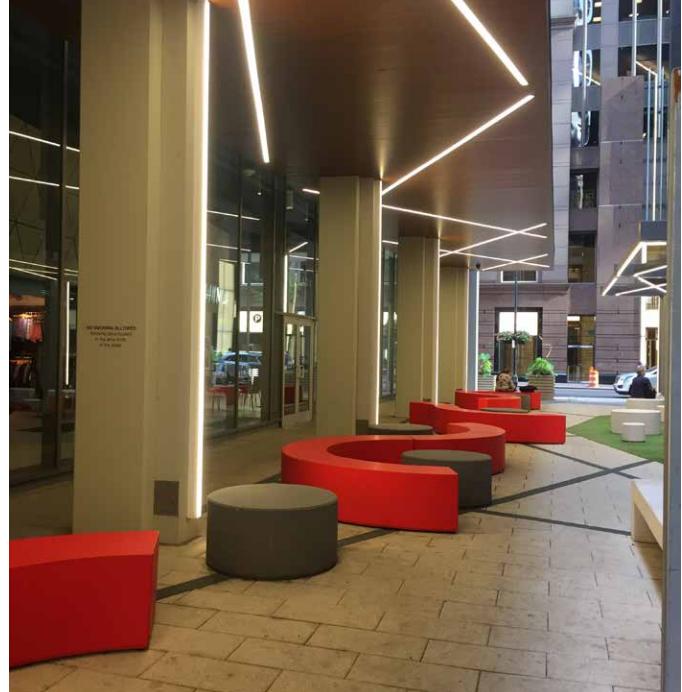


Images 31 (Top), 32 (Bottom), 33 (Right): This alley corridor has been adorned with murals. It houses essential building systems and logistics.
(Source: Authors)

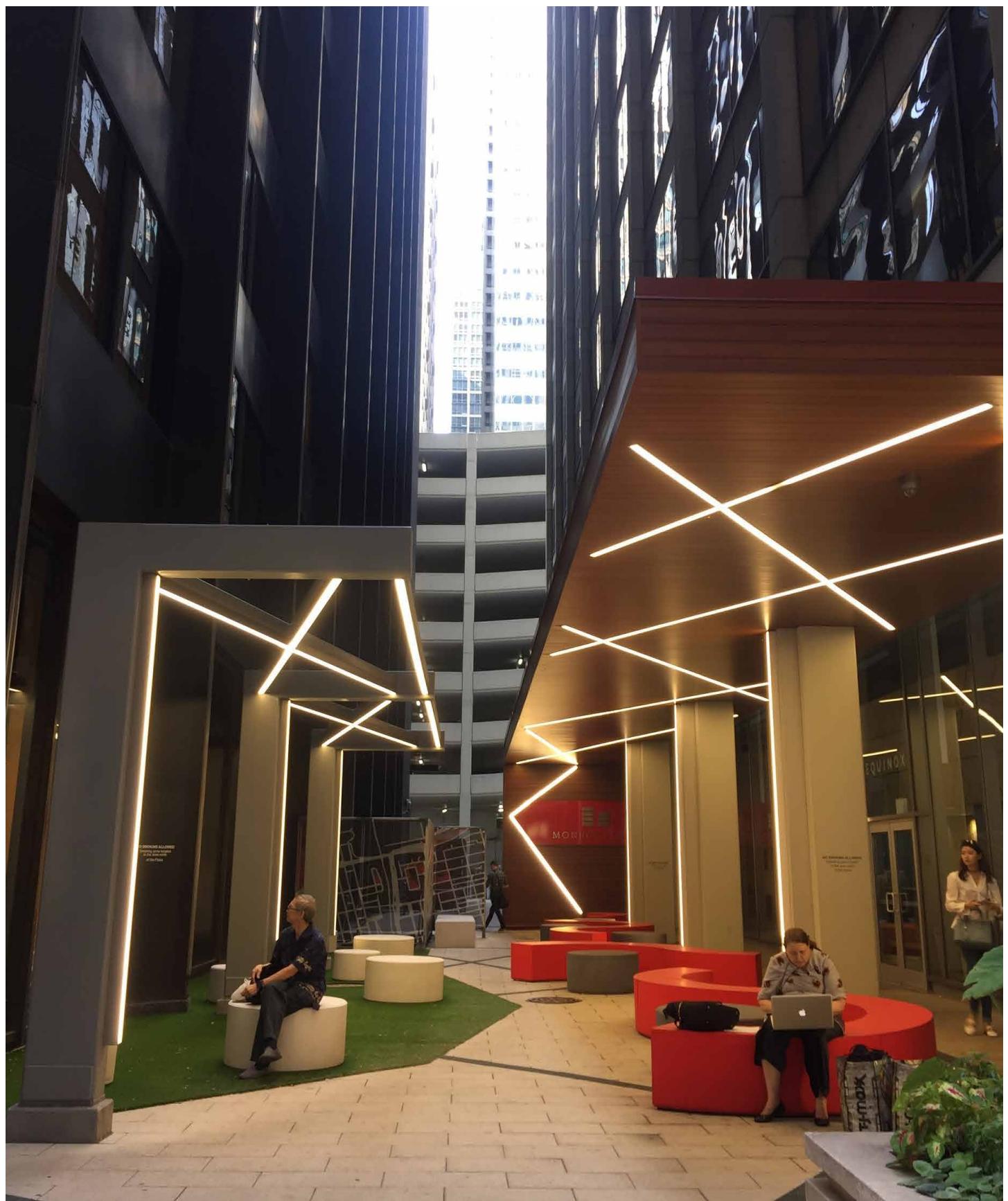


Arcade Place Alley (50 S Wells)

A privately owned place with a public alley. The owners of the buildings chose to add public amenities such as seating, lighting, covering the sight of logistical services like trash collection, and internet Wi-Fi, activated through the ground level retail services. The design of this space is an example of a commercially driven, public-private partnership to invigorate and soften typical hard edges between the steel structures that dominate the Loop landscape. Individuals utilizing this space were seen admiring the unique design of the site, utilizing the “alternative” workplace amenities offered, and relaxing after appearing to workout at the nearby athletic club. Landscape features included the implementation of tactical urbanism features such as an imitation lawn, planters, and soft lighting.



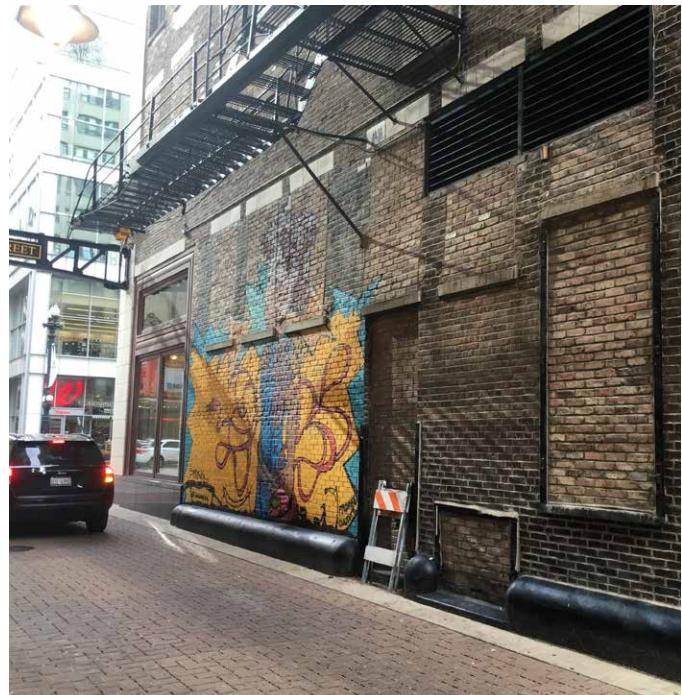
Images 34 (Top), 35 (Bottom Right), 36 (Bottom Left), 37 (Right): Alley provides a modern appeal, using small interventions to hide negative logistic equipment and entrances.
(Source: Authors)



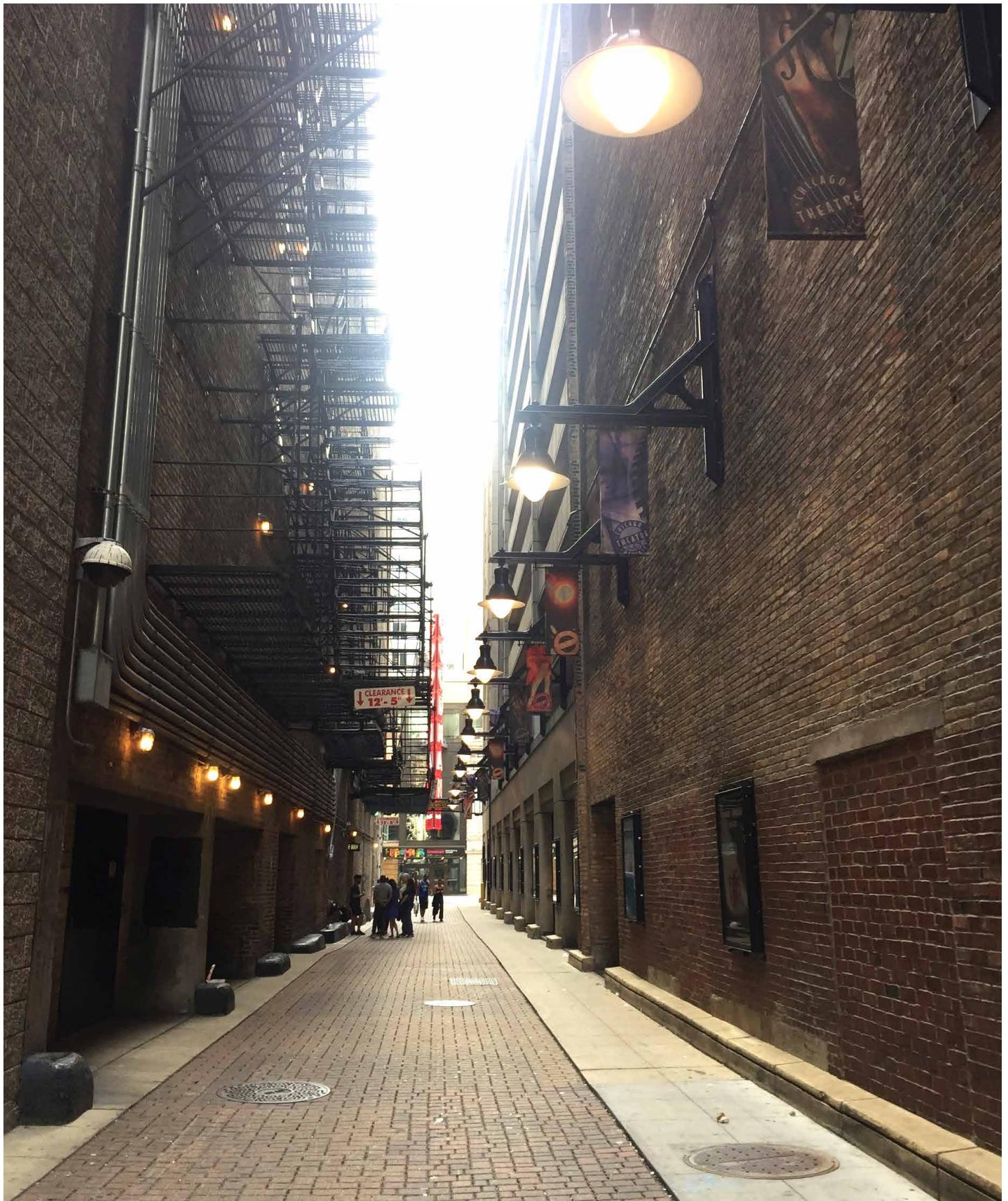
Green Alley Pilot (170 N State)

The original pilot site. Located in the theater district of Chicago, the Couch Place Alley served as the pilot site for the Green Alley Program. Using a hybrid combination of concrete sidewalks and permeable pavers, the site provides stormwater management in an area of the loop that receives significant recreation activity. After its implementation, the surrounding buildings have used this space as an outdoor area. Observed activities included seeing theater individuals relax, people using it as corridors, advertisements facing the alley, and unique lighting and banners adorning the walkways. Observations from practitioners in the area suggest that the alley needs proper maintenance to sustain its stormwater services. Although the alley is devoid of natural elements, runoff carrying sediment may clog the permeable material, forcing the city to reconsider the maintenance of a small alley within 1,900 of more conventional pavers.

The implementation of this green alley project has become a catalyst to the surrounding area, redefining alleys as passageways and pedestrian experience in the Loop. East of Couch Place Alley, Benton Place Alley has constructed a mixed use program that expands sidewalks, adds interesting paver and bollard material, and creates a more pedestrian friendly walkway. Port Urbanism, a design firm focused on designing for people in small spaces, introduced ideas in historical programming that allow ACTIVATE patrons to live within the history of the development of the Loop.



Images 38 (Top), 39 (Bottom), 40 (Right): The corridor alley connects two venues in the Theater District of Chicago. With marked entrances, the alley provides a perceived welcoming experience.
(Source: Authors)



SITE LOCATIONS

Gold Coast

This affluent neighborhood of Chicago is located by the shores of Lake Michigan. Adorned by higher density dwelling, the alleys of the Gold Coast provide an important access point for residents. This historic alley is one of its kind as it uses wooden pavers. Once used as a material all over the city, the use of wooden pavers were seen as an alternative by the fast growing city with limited access to stone material. The alley was restored to a more vibrant condition in 2011 and remains as a historic element of Chicago. (Source: Forgotten Chicago)

Wooden Alley

The Wooden Alley, A Historical Icon. Located in the Gold Coast neighborhood, this alley is one of the last alleys using wooden paver material. The alley has been valued as a historical element of the city, remembering the miles of alleys paved with wood before and after the Great Chicago Fire of 1871. After a storm event, the pavers appear to have absorbed runoff and detained in areas where the elevation was altered. Considering Chicago's swampy soil, the pavers require certain maintenance compared to conventional paving equipment. The pavers also provided a noticeably more comfortable environment during a day that reached 35 degrees Celsius. This may have been due to the density of vegetation in the neighborhood, winds off the lake, and the moisture in the air maintained by the wood pavers.



Images 41 (Top), 42 (Bottom), 43 (Right): As seen from the images above, the wooden pavers form the same aesthetic as brick pavers. The slight growth of moss is seen in the alley. The experience was more comfortable as compared to conventional alley pavers, through its historic appeal and retaining of air moisture. (Source: Authors)

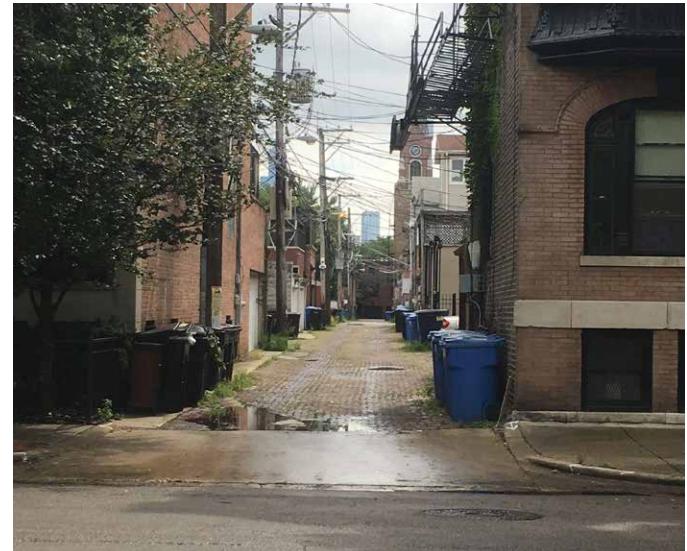


SITE LOCATIONS

LINCOLN PARK

Historic Residential Neighborhood and Its Alleys. The Lincoln Park neighborhood presents different housing typologies such as row homes and brick apartment buildings. Bordered by the city's largest green space and Lake Michigan, the observations noted were related to the use of alley spaces by residents in a typical neighborhood. The neighborhood's historic attributes are seen through the use of brick pavers in alleys. The need for maintenance was seen through the cracked pavers, sitting water, and partial flooding nearby structures. The importance of the alley system to the neighborhood was evident as multiple utility systems were present. Uses by residents were observed through the parking of vehicles, entryways to dwellings, dog walking, play space, informal back yards, and storage. Climatic conditions were observed to be uncomfortable as alleys remained largely unshaded and the asphalt material increased air temperatures. Alley typologies in this neighborhood were similar and combined to the urban pattern.

Typical Lincoln Park Alleys



Images 44 (Top), 45 (Bottom), 46 (Right): As a more typical Chicago Neighborhood, Lincoln Park provided information of the more conventional uses of alleys, such as pedestrian corridors, garage access, and places for unwanted scenes, like trash collection.
(Source: Authors)

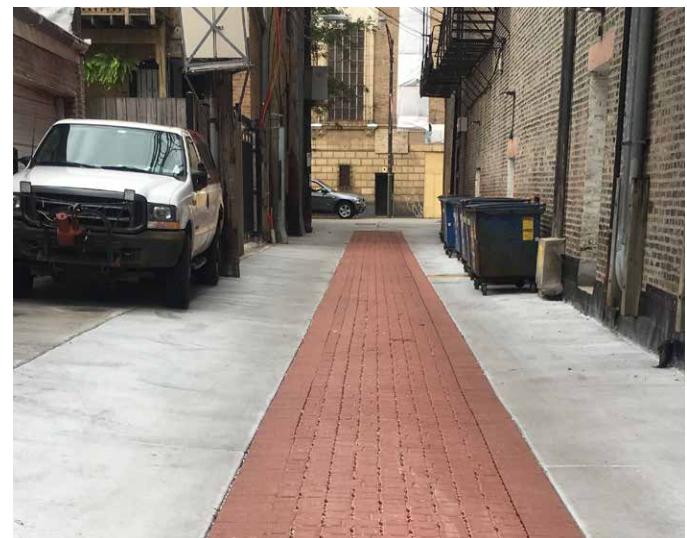
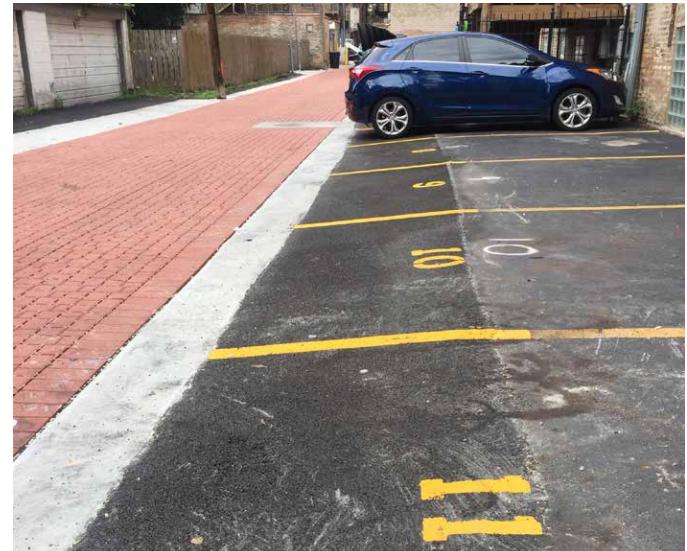


SITE LOCATIONS

UPTOWN

The Uptown Neighborhood is located on the Northside of Chicago. The Magnolia Street Green Alley is the newest installation in the city's series of green improvements. In this alley, the material used includes pervious pavers in the majority of the area. In some areas, there is a channelized approach including the use of vegetative strips on the edges of pavements. As seen from the photos, the alley is an important logistical element for the neighborhood as it provides access to car storage, back door exits, and essential infrastructure services as well as a pedestrian corridor.

Magnolia Street Green Alley



Images 47 (Top), 48 (Bottom), 49 (Right): A new installation, this site allowed the team to understand how new installations look like and how the community appreciates or uses this space.
(Source: Authors)



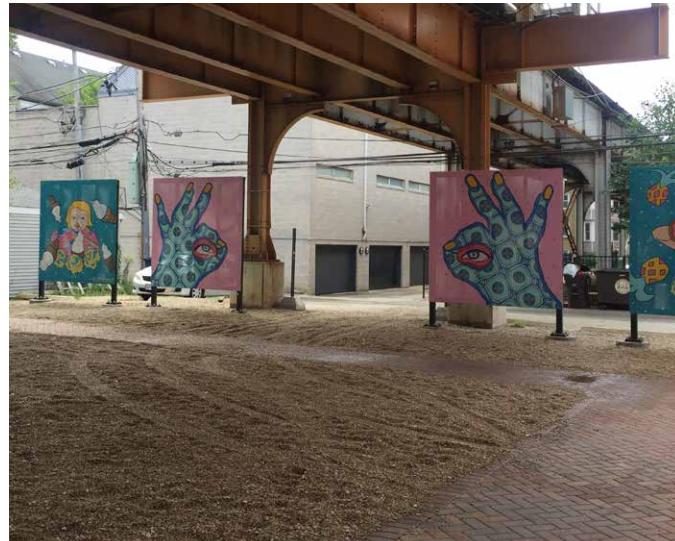
SITE LOCATIONS

SPACES IN BETWEEN

The “spaces in between” refers to places in the landscape where the presence of large parks is not possible but interventions could add to community dynamics. Recent projects like this could refer to the High Line in New York City, there the “space in between” was an abandoned railroad line that, once converted, became a landscape icon replicated and adorned by the entire world. These spaces offer opportunities to re-think conventional landscape interventions, focusing on smaller, alternative proposals that excite new places.

Low Line

The “space in between” the ground and the ‘L’, Elevated Rail, is a constant element of the soundtrack of Chicago both positively and negatively associated. The group met with designers at Port Urbanism, a firm dedicated to accenting these small spaces. Their concept for activating these spaces revolved around the idea of tactical art. Through the use of these yellow sculptural, multi-functional spaces, the Paulina ‘L’ Station becomes a dynamic social corridor. Murals adorn the corridor while the artful elements can be easily used by local vendors, residents, and become a unique “instragram” moment for the digital age. Through this intervention, the definition of spaces underneath the ‘L’ take one a new shape and provide alternatives to residents using this transit system.



Images 50 (Top), 51 (Bottom), 52 (Right): These ‘ports’ are multi-functional objects. The team was amazed at this small corridor of art and attention to the ‘L’ was eased by these colorful expressions.
(Source: Authors)

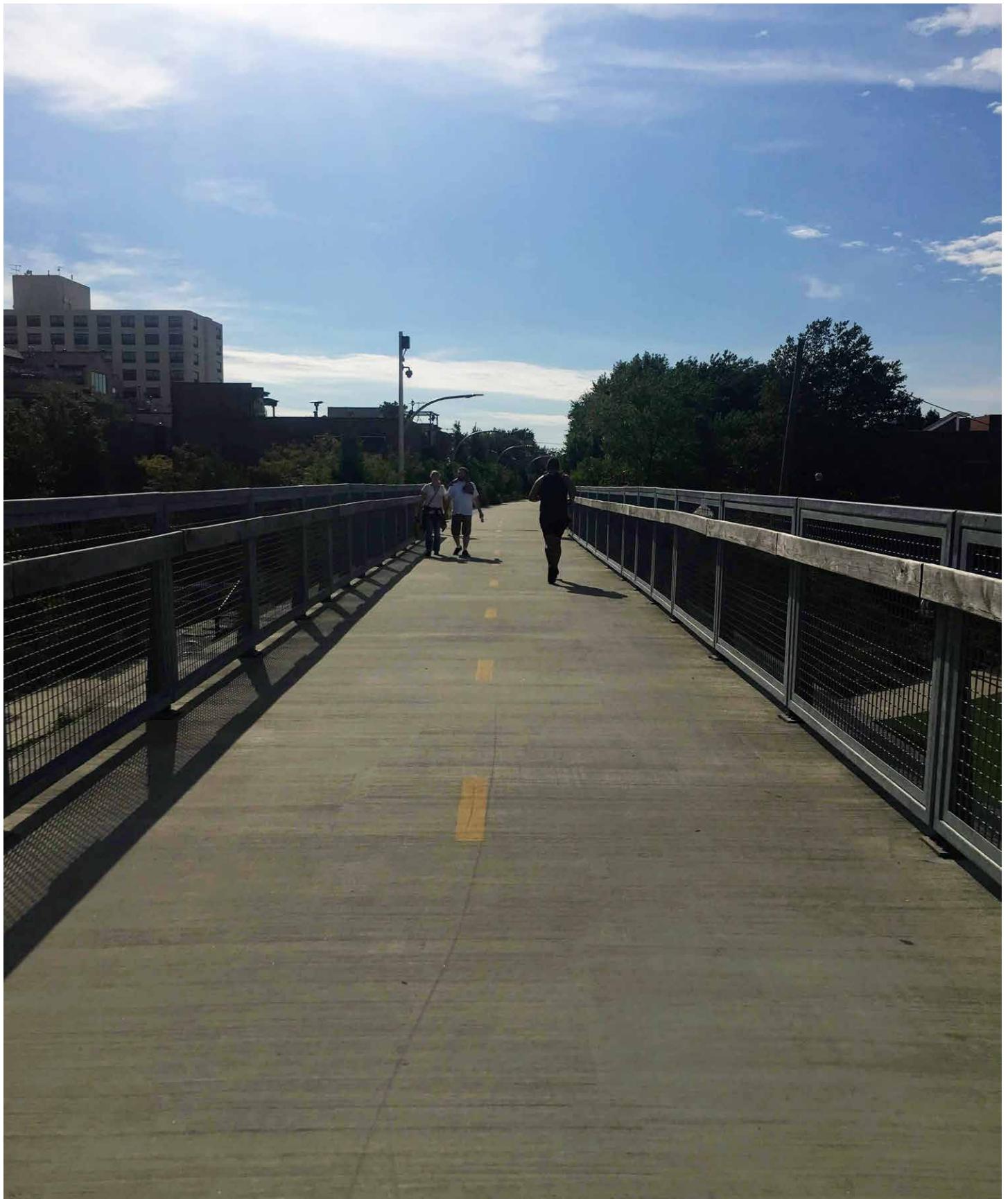


The 606 Bloomingdale Trail

Similar to New York City's High Line, the 606, named after its respective zip code (606XX), this pedestrian highway connects four dynamic and diverse neighborhoods: Bucktown, Wicker Park, Logan Square, and Humboldt Park. The converted railway is adorned by planting spaces that provide more relaxing opportunities, and provide a unique experience distance pedestrians from the noisy streetscapes.

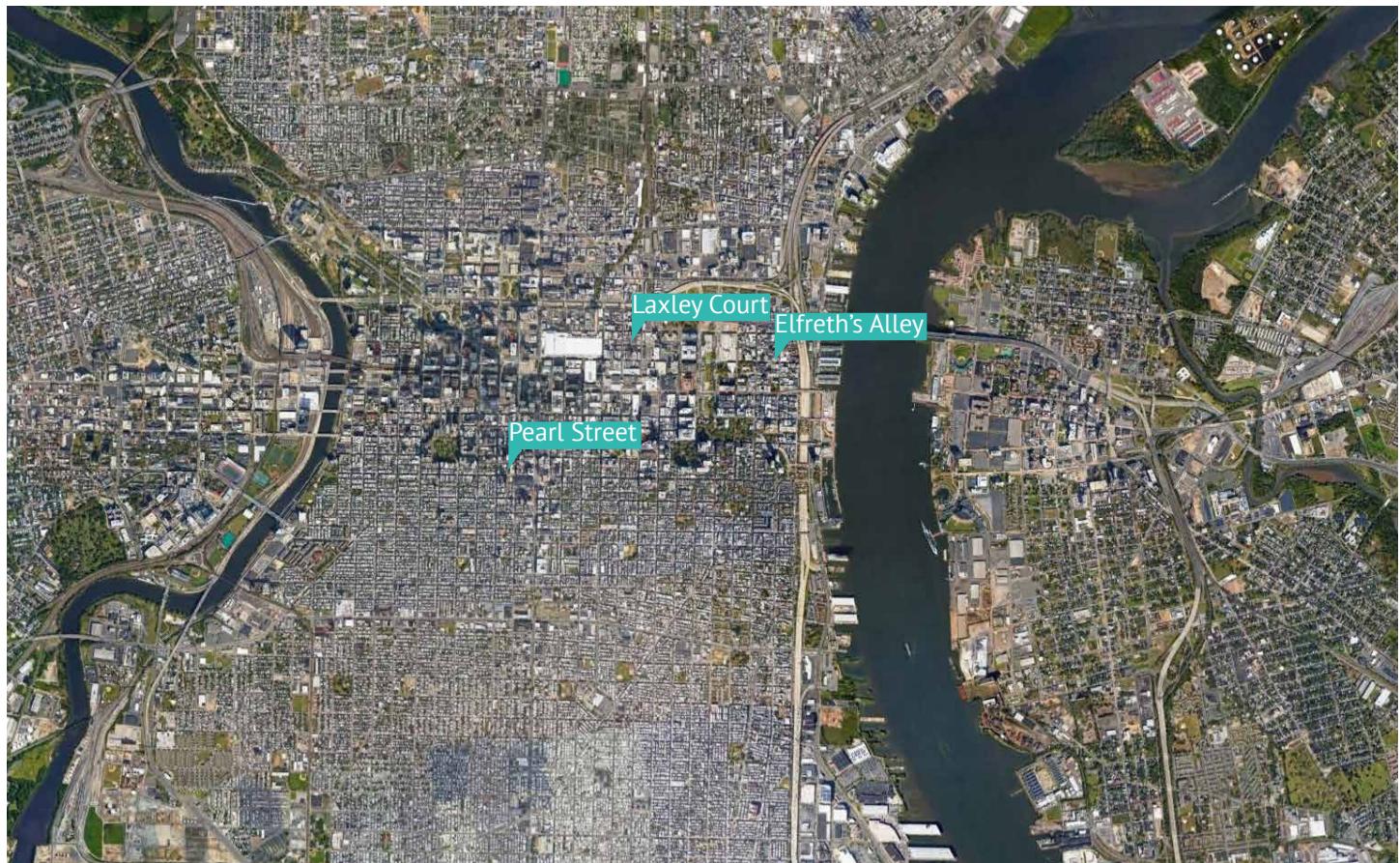


Images 53 (Top), 54 (Bottom), 55 (Right): A 'space in between' that now serves as a pedestrian superhighway connecting some of the most ethnically and economically diverse areas of the city.
(Source: Authors)



CASE STUDIES

Philadelphia, PA



Date: October 19-22, 2018

Locations: Old City, North of Market, Chinatown

Organizations: American Society of Landscape Architects National Conference 2019

(Image 56 Source: Google Earth)



(Image 57 Source: pixels.com)

Introduction

Alleys, although occupying large areas of cities, have been neglected by people. Numerous cities in North America have started reclaiming their alleys from negative activities by greening the service lanes, or back ways, that run behind some houses. The word “alley” refers to narrow pedestrian paths or city streets (Hacker, 2011). In older cities and towns in Europe, alleys are often what is left of a medieval street network, or a right of way or ancient footpath (Cesaretti, 2016). Similar paths also exist in some older North American towns and cities like Philadelphia. The Old City and Society Hill neighborhoods of Philadelphia, the oldest parts of the city, include a number of alleys, notably Elfreth’s Alley which is called “Our nation’s oldest residential street”, dating back to 1736.

green stormwater infrastructure(GSI)solutions to reseed what are currently impervious watershed hardscapes. Green alleys are applied by PWD in this program. Alleys behind houses and commercial buildings that are currently impervious and drain to combined sewer system are identified as an opportunity to either be used for infiltration, or to convey stormwater to green stormwater infrastructure(GSI) located at the end of an alley.

History

Over three hundred years ago, William Penn, the founder of the Province of Pennsylvania, created the “Greene Country Towne” vision for Philadelphia. Although as the city developed, Philadelphia has become a hub for politics, business and technology, and new values sustainability and resilience.

The Philadelphia Water Department(PWD) has amended the Green City Clean Water Program since 2011. Coupling with the Federal Clean Water Act, PWD developed an infrastructure management program intended to protect and enhance the region’s waterways by managing stormwater runoff to significantly reduce reliance on construction of additional underground infrastructure. The program includes a plan to invest in

SITE LOCATIONS

OLD CITY

Elfreth's Alley (126, Elfreth's Alley)

Known as “Nation’s Oldest Residential Street”, located in Old City neighborhood. Elfreth’s Alley was added to the National Register of Historic Places in 1966 and is a National Historic Landmark in Pennsylvania.

Elfreth’s Alley Association (EEA) took decades to preserve and create an interpretation of daily life of 18th century working-class families lived on this street. Red brick trinity houses show 18th century architectural details such as perfectly fitted shutters and flower boxes. The center of the alley is paved with tiny cobblestones which is a repeated historical element in the Old City.

Two homes that are adjacent to each other: 124 and 126, which are now Elfreth’s Alley Museum is open to the public and preserved their Colonial-era appearance. Exhibitions in the house and tour guides interpret the life of the house and alley’s residents in that era. Except for the museum, most of the first floor of these two to three story houses are commercially used as stores, restaurants, cafe and etc. Second and third floor are mostly for residential use. Elfreth’s Alley nowadays is still home to a resident population. Events and holiday celebrations are held in the alley every year, attracted large amount of people not only from nearby neighborhoods, but people all over the city and tourists as well.

As a mixed-use alley, Elfreth’s alley has its unique history and background, showing an alternative potential for alleys.



Images 58 (Top), 59 (Bottom), 60 (Right): Also a tourist attracting, revealing many ideas of the built environment during colonial times.
(Source: Authors)



Loxley Court(321 Arch)

Benjamin Loxley, a carpenter who worked on Independence Hall and Carpenters' Hall, was the court's first resident in 1744. The alley is a typical residential alley between brick houses and paved with patterned brick pavers. Potted plants and outdoor iron table setting, give this alley a historic everyday atmosphere. Safety sensation is perceived in the alley due to windows of adjacent houses and signs of stewardship and care. Through a brick arched door, there is a quiet courtyard garden with sculptures, seatings and planting beds. It is a functional space which could attract people to enter the alley space, while providing a sense of perceived privacy and safety.



Images 61 (Top), 62 (Bottom), 63 (Right): This court is a historical element and is a principal access point for the occupants of these buildings.
(Source: Authors)



SITE LOCATIONS

CHINATOWN

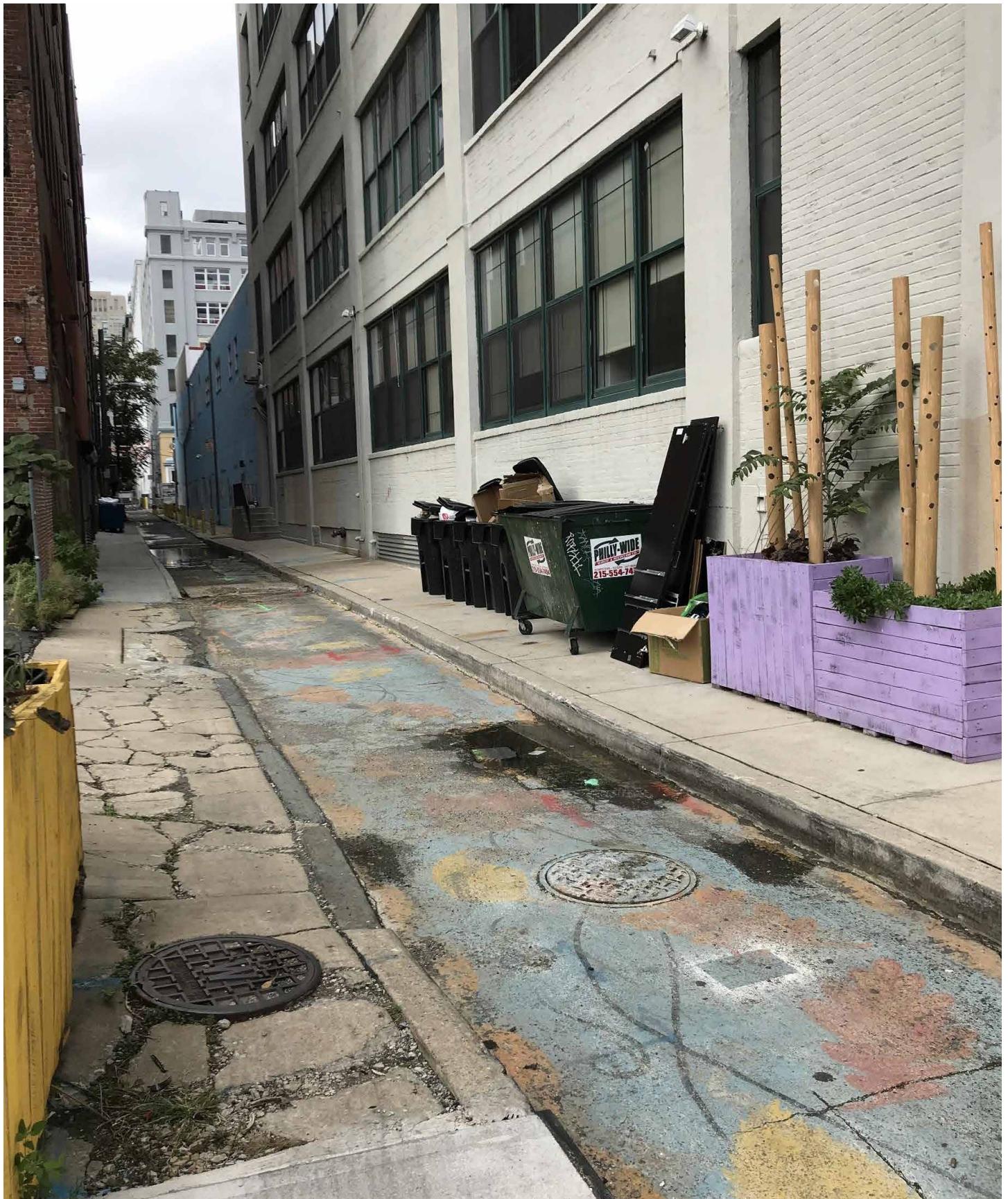
Pearl Street

The Pearl Street project programming is initiated by the Asian Arts Initiative, in partnership with landscape architects, artists and stakeholders, on four blocks of Pearl Street that run from 10th to Broad Street. "Asian Arts Initiative is leading a multi-year effort to transform the neglected alley into a community asset that connects the diverse constituents in our neighborhood and beyond". [Citation] During the first phase, the alley was repaved and installed with lights to address safety issues. Through 2013 to 2015, several illuminating and activating events were held in the alley: block parties, community feasts, creative activity booths, interactive furniture builds and pop-up exhibitions. There were a lot of participants in these events with different cultural backgrounds.

The future envisioning of pearl street is still to be determined. However, several potentials are on the desk, including an art gallery, green pavers and a green wall. During our visit, standing water was seen in the alley. Maintenance and stormwater management in the alley need to be improved.



Images 64 (Top), 65 (Right): This alleys has been a great platform for tactical interventions for the community. Signs of social value and needed repairs are apparent.
(Source: Top: Hood Design, Right: Authors)



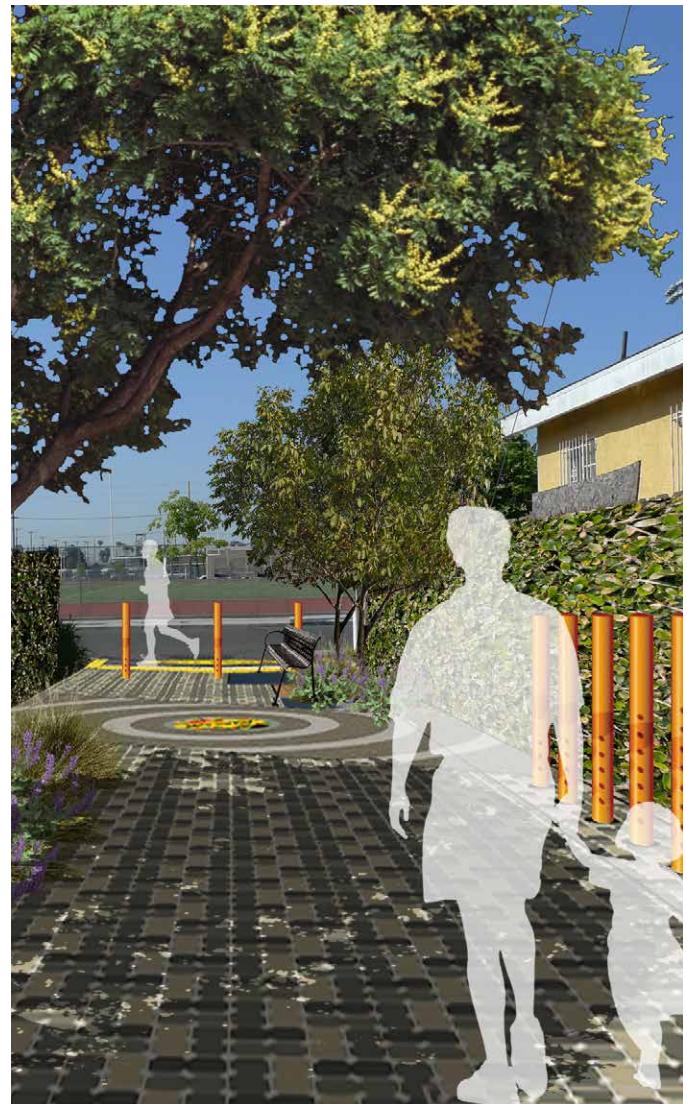
SITE LOCATIONS

ASLA Philadelphia National Conference

The American Society of Landscape Architects Annual Conference in Philadelphia provided many opportunities to learn from practitioners and innovators of the field. At this annual conference, the group had the opportunity to attend a lecture oriented towards alleys, *Rethinking Small Alleys: A Path to Big Hope*, led by Joowon Im (UT-Arlington), Melissa Guerrero (The Trust for Public Land), Darryl Condon (HCMA Architecture + Design). Through these lectures, the group learned about how diverse interventions, from tactical urbanism to constructed green concepts, can activate a small space like alleys and be vibrant areas of the community.

The Los Angeles Green Alleys

A project led by the Trust for Public Land, the Green Alley program in Los Angeles focuses in a park-deficient area of the city, also suffering from alley misuse and increased levels of poverty. Through community involvement, the team developed a participation platform for citizen opinions and groups to fulfill the completion of this project. These alley spaces serve not only as utility spaces but also important stormwater management features along with a new social use of the community, further increasing the perception of safety in the area. The project has sparked stewardship for these spaces with residents supporting essential volunteer maintenance processes.



Images 66 (Top), 67 (Right): Los Angeles Alleys as social spaces.
(Source: The Trust for Public Land, SALT Landscape Architects)



CASE STUDIES

Detroit, MI



Date: October 26, 2018

Locations: Downtown, Midtown

Organizations: The Belt, ECO-D

(Image 69 Source: Google Earth)



(Image 70 Source: kryzproperty.com)

Introduction

Once significant sites of community life, alleys have receded from popular consciousness in the wake of urban renewal, suburban development, and popularization of the automobile (Martin, 2001, Wang and Taylor, 2006, Wolch et al., 2010). However, growing interest in greening the urban built environment has turned new attention to urban alleyways (Seymour et al., 2010). Detroit's efforts to transform the alleys started with a single demonstration project, the Detroit Green Alley. Now, alleys in Detroit are being resurfaced and greened up one by one with funding from the community-development groups.

Alley Program

The City of Detroit, led by the Detroit Water and Sewerage Department (DWSD), is taking an approach to citywide stormwater management. This approach emphasizes the need for consistent, comprehensive stormwater performance standards for both public and private development, while also promoting the use of green stormwater infrastructure (GSI) in Detroit (City of Detroit, 2018). The Stormwater Management Design Manual comprises engineering methods for stormwater control measures and it established to reduce the volume and improve the water quality of stormwater discharges. The Design Manual addresses GSIs: Large Detention Practices, Bioretention, Infiltration Basins and Trenches, Permeable Pavement, Water Harvesting, Green Roofs and Walls, Stormwater Wetlands, Manufactured Treatment Systems which can be used for the stormwater management in the alleys.

Local organizations have embarked on alley revitalization projects that have been sourced through grants, crowd funding, and renewed interest by the community. Some of these organizations include business organizations like: Green Garage, Motor City Brewing Works, Downtown Detroit Partnerships, and local organizations like: EcoWorks, Midtown Detroit, Inc., Liberty Street Collective, Knights Arts, and Michigan Council for Arts and Cultural Affairs. These alley revitalization projects have had diverse goals, ranging from stormwater management to social and cultural spaces.



Images 71: From the Alley Project in Southwest Detroit, an exhibition of graffiti.
(Source: Top: CityLab)

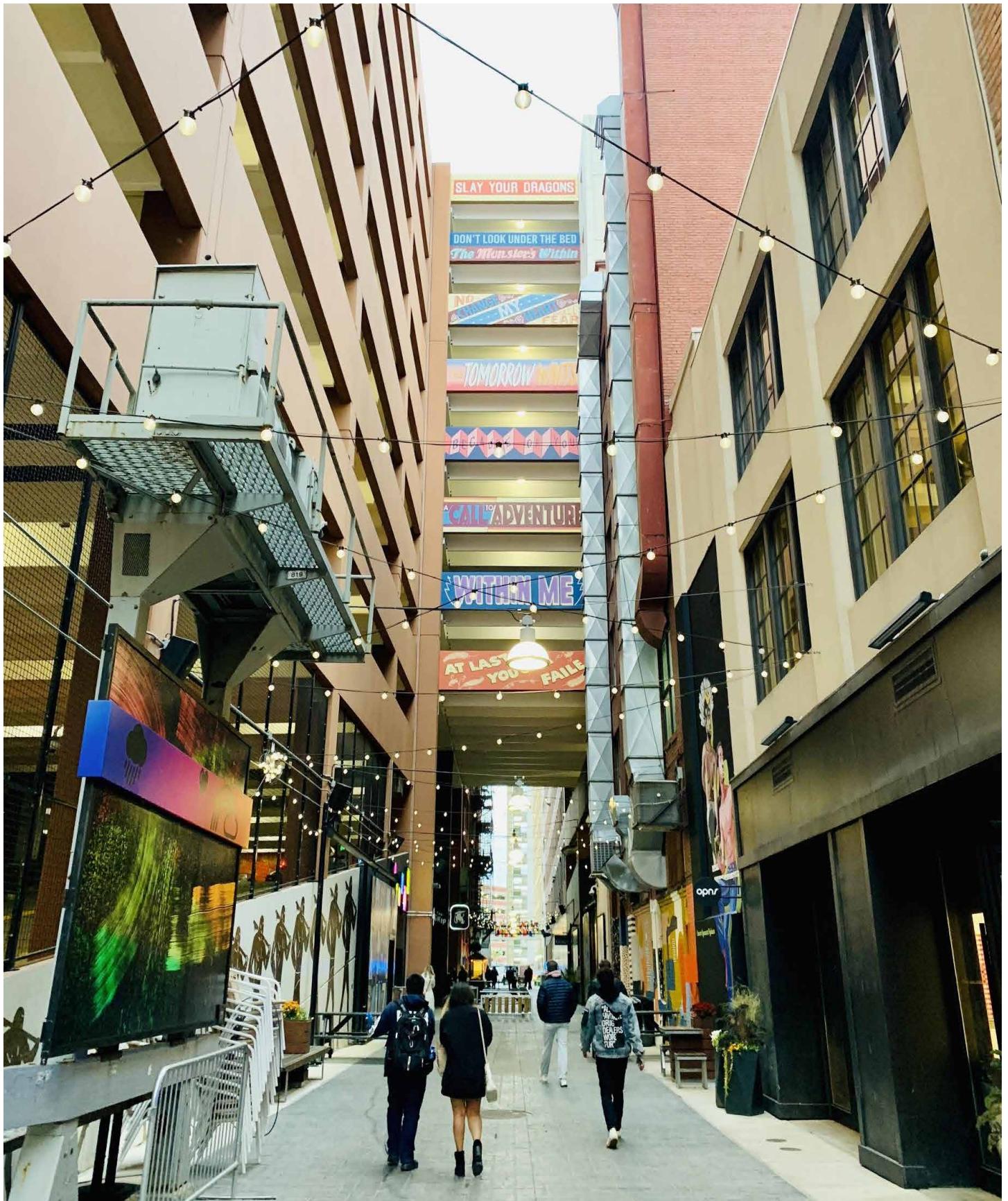
SITE LOCATIONS

DOWNTOWN

The Belt

Located between Broadway and Library Street and links Gratiot and Grand River, The Belt has redesigned a downtown alley as a commercial strip and public art destination. Attracting local, national and international artists to produce murals and installations, the Belt is a feature of public art. Library Street Collective has continuously supported the project. The Belt is now a bustling destination, especially in the summer months, it's creating a fully public "24-hour neighborhood."

Images 72 (Right): The Belt on a Friday Night after work in Downton Detroit.
(Source: Authors)



SITE LOCATIONS

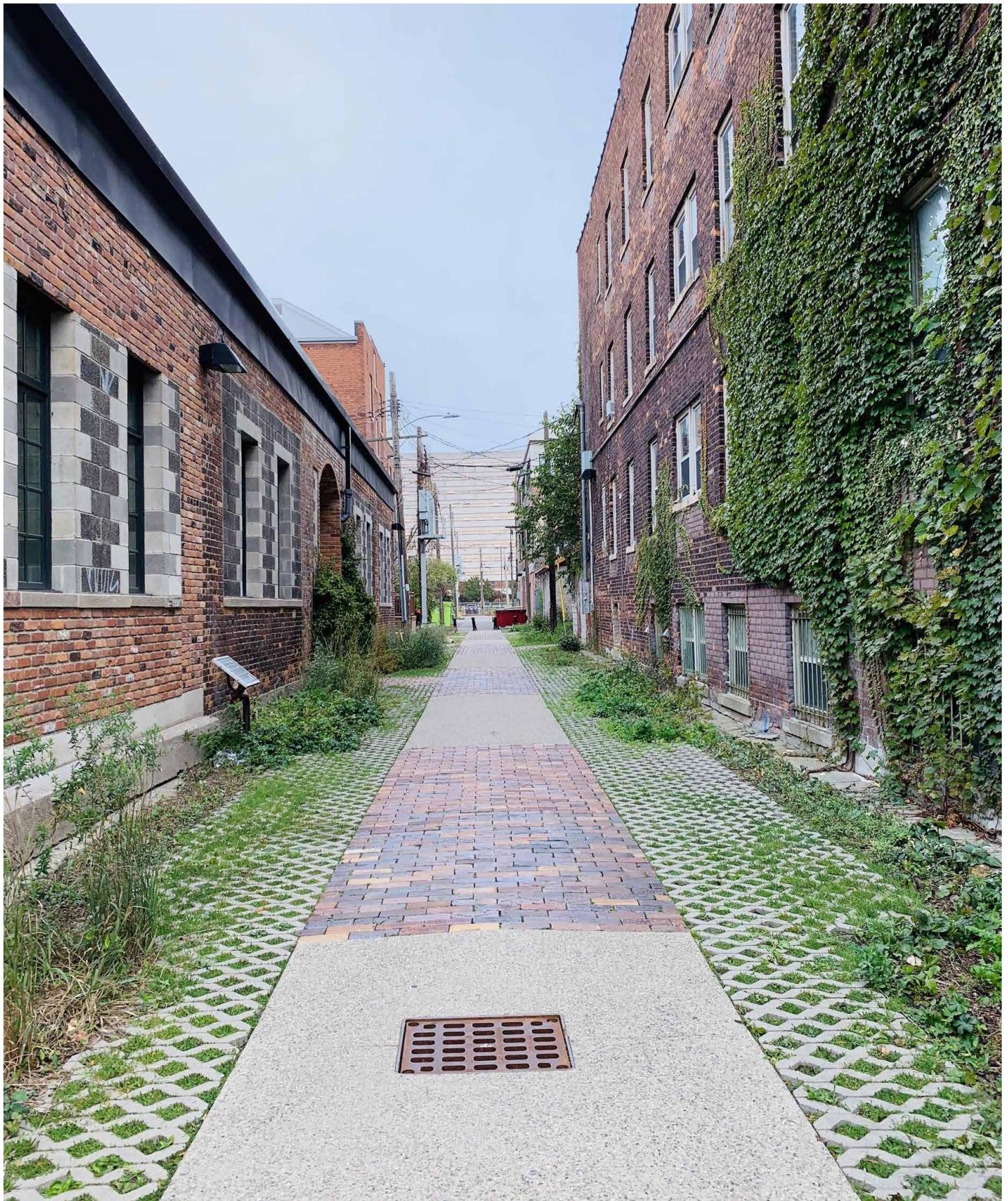
MIDTOWN

The Green Alley

The Green Alley, located within the City of Detroit's alley right-of-way, bounded by Second Avenue, Selden, the Third Avenue alley and Alexandrine. This project transformed a 415 foot long alley with the purpose of connecting future developments, promoting walkability and community connectivity. Using green construction processes, the project transformed unsafe passageway into an inviting place of native plants and shrubbery and a walkway of historic brick pavers. The Green Alley also includes induction lighting, stormwater systems, a waste and recycling center, and bicycle zone restricting all vehicular traffic except for service and emergency vehicles.

The Green Alley has become a model for "living alleyways" which offer both sustainability and community-building attractiveness locally and beyond. Following in the leafy footsteps of community gardens and pocket parks, many urban planners see these revived, greenified alleyways as the next great possibility in citizen-driven sustainable urbanism. MDI, Midtown Detroit Inc., in partnership with Motor City Brewing Works and the Green Garage, provided support and oversight on the project. North Cass Neighborhood residents and other nearby property owners provided additional support and involvement.

Images 73 (Right): The Detroit Green Alley in Midtown on a Fall Afternoon. The team observed how resilient this system is, noticing positives and negative to the project. (Source: Authors)

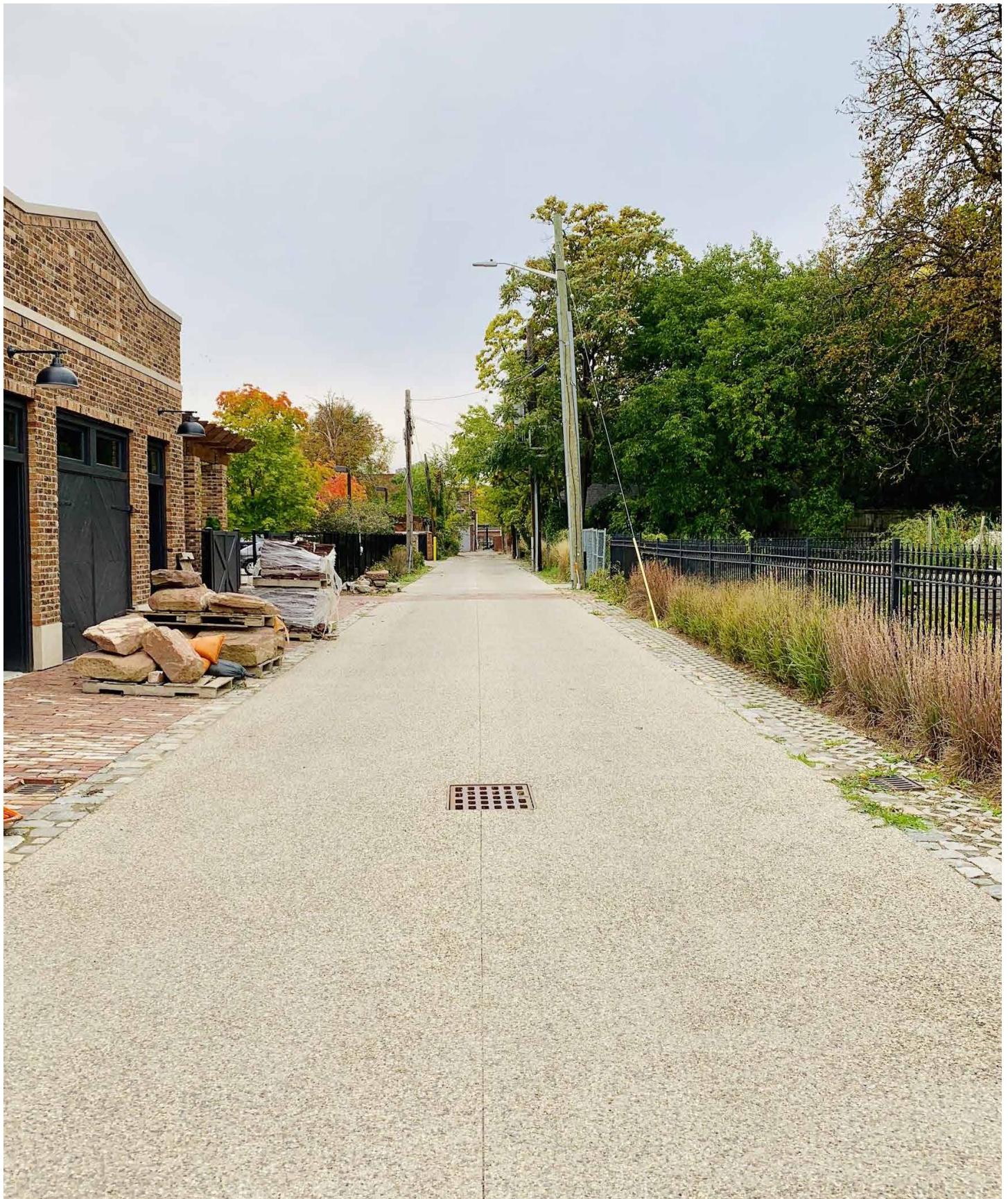


El Moore Green Alley

The El Moore Green Alley is located right next to the residential apartment complex that is designed to be a model of urban sustainable living, which is on West Alexandrine. Since El Moore's alley is required to allow vehicle access, it looks different from the Detroit Green Alley, which is pedestrian only passageway. It includes 14 feet of concrete at the center, with three feet of absorbent lattice paving on each side. The alley incorporates recycled pavers materials and native plants. Its five components: a residence, a lodge, a park space, a seasonal store, and a green alley revitalized the corner of Second and Alexandrine by offering residents, neighbors, and travelers new ways to connect with each other, the built environment, and the natural world.



Images 74 (Top), 75 (Bottom), 76 (Right): El Moore Alley provides access to back entryways. The entry way near the major arterial road is completed, while towards more secluded areas there is more unmaintained areas.
(Source: Authors)



RESULTS

Survey data analysis



OPENING STATEMENT OF SURVEY

“

Detroit alleys need your help. From utility lines to sink holes, from overgrowth to dumping, we're interested in what it is that you think should happen in our alleys, from improvements to how we use them. Please take a few minutes to complete this confidential survey, and please also be at least 18 years of age, and a resident of the Villages of Detroit (the boundaries of which are Mack Avenue running south to the Detroit river, from Mount Elliott Avenue in the west to Cadillac Boulevard in the east). ”

Introduction

The survey was designed using Qualtrics, online survey development and distribution portal which also helps quantitative statistical analysis of the collected data. The survey consisted of 15 questions which required a mix of closed and open-ended responses.

The survey opens with an introductory statement to engage responses from the community and make them aware of the current alley-green infrastructure projects. As an incentive to take the survey, a draw was taken out for a \$25 cash prize. Demographic questions were asked towards the end of the survey. The questions were not made mandatory, so the number of responses for each question varies.

The following are the survey questions and responses received from 101 community members. The data collected for demographics (current address or nearest house intersection) was geolocated over villages area to get an understand the spread of received responses.

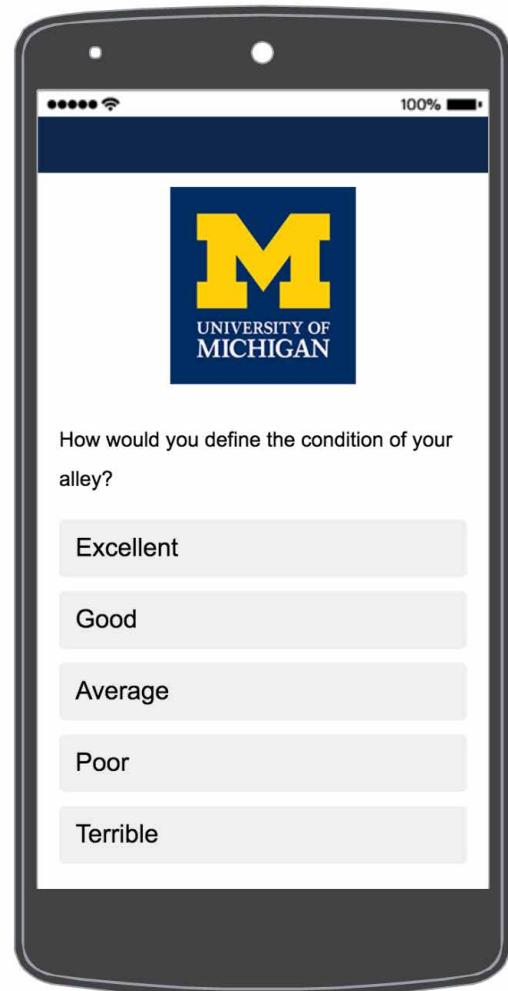


Image 78 (right): Screen shot of survey as viewed on mobile
Source: Authors

How would you define the condition of your alley?

- Excellent
- Good
- Average
- Poor
- Terrible

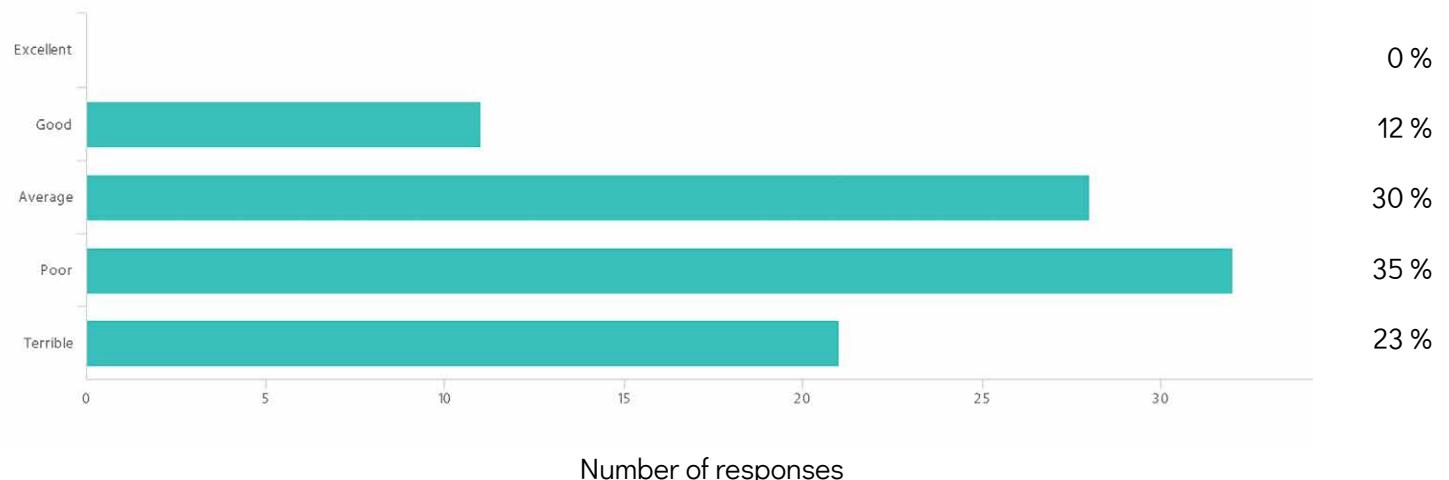


Chart 02 (above): It was critical to ask this question from community members to understand how they perceive their neighborhood alleys. The shows responses from 92 people, out of which about 35% people claimed their alley condition to be "POOR". On the contrary, the alley classification based Map 01 on aerial image classifies those areas to be in good condition.



Map 02 (above): The map above shows the condition of alleys in based on geo-located survey responses.

Please describe your alley pavement type?

- Asphalt
- Concrete
- Brick pavers
- Don't Know
- Other (please specify) _____

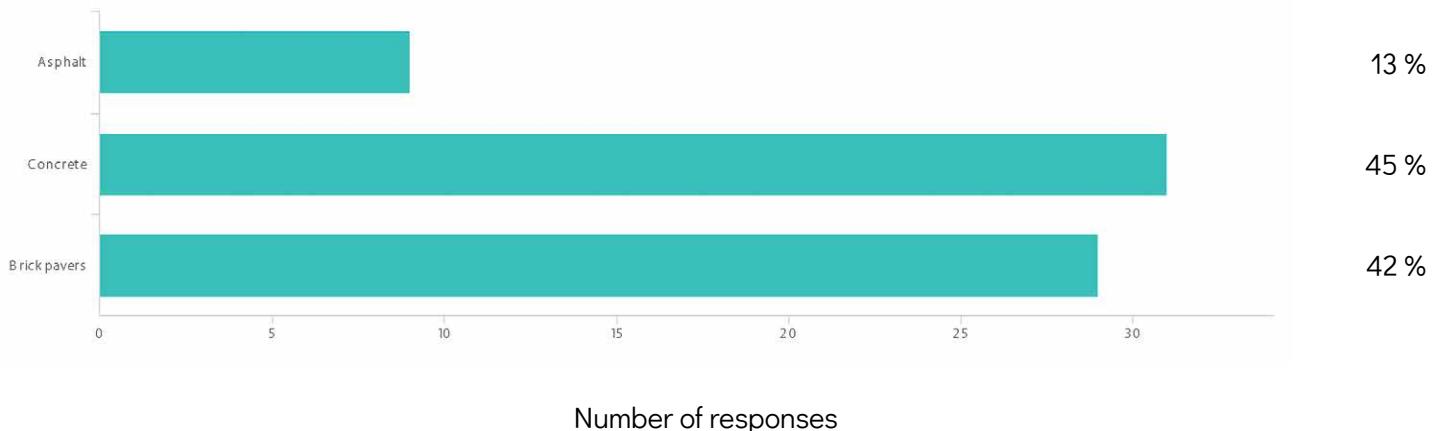


Chart 03 (above): The graph above shows the responses from 69 people, out of which majority of people (about 45%) said their alley had concrete pavement. Brick pavers being the second most common type of alley pavement and very few alleys paved with asphalt.

Other responses included - Dirt, overgrowth, mix of concrete, bricks or asphalt, loose stone and mixed surface



Map 03 (above): The map above shows geo-located survey responses for alley pavement type.

Does your alley have sink holes?

- Yes
- No
- Maybe

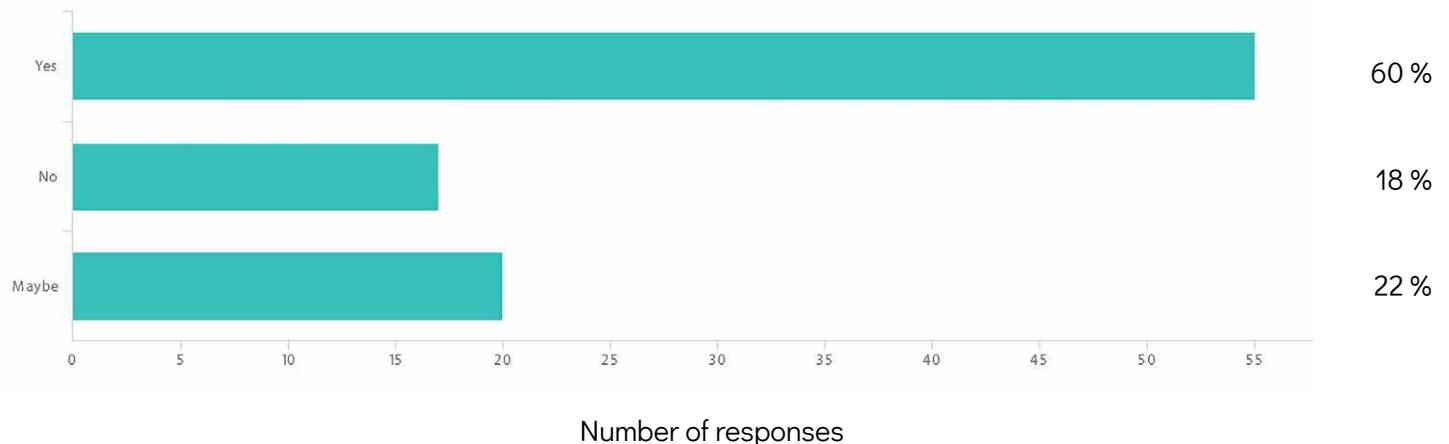
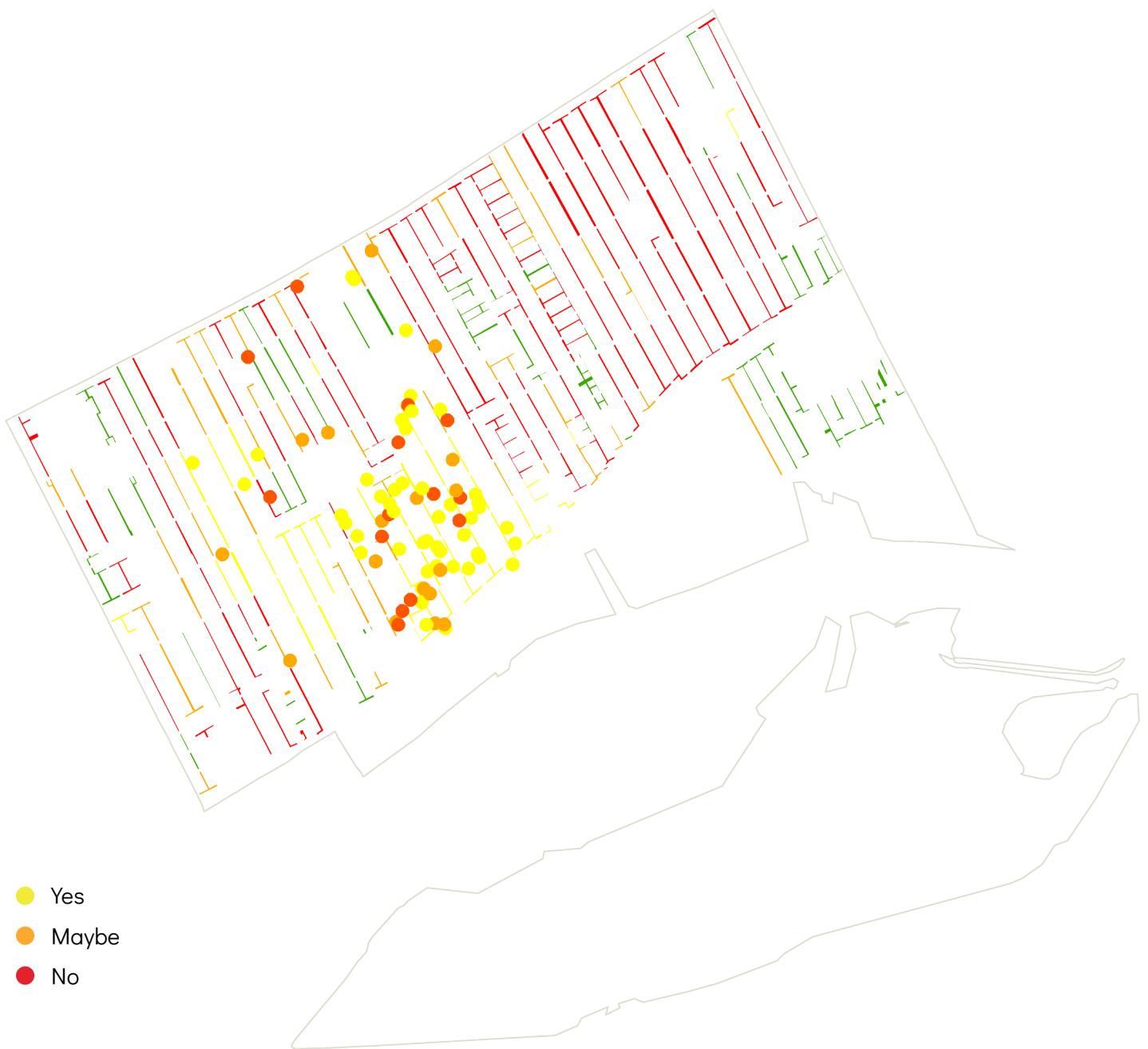


Chart 04 (above): The graph above shows the responses from 92 people, out of which majority of people (about 60%) said their alley had sink holes. This is useful information in order to identify alleys in need for immediate repairment.



Map 04 (above): The map above shows the location of alleys with sink holes based on geo-located survey responses.

Does your alley flood?

- Very often
- Often
- Neutral
- Sometimes
- Never
- Don't know

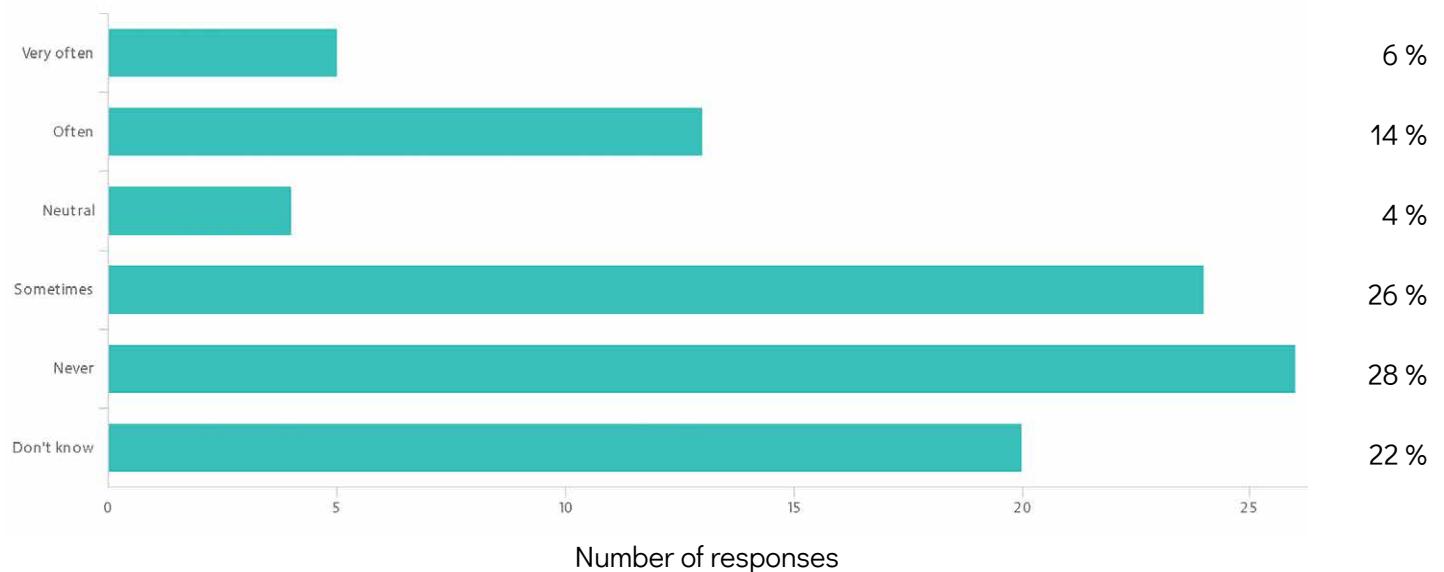


Chart 05 (above): The graph above shows the responses from 92 people, out of which majority of people (about 28%) said their alleys flood during a storm event. Although most people reported that flooding is very rare occurring in their alleys.



Map 05 (above): The map above shows the location of alleys which flood based on geo-located survey responses. Many alleys originally identified as good condition alleys flood occasionally.

Does your alley attract illegal dumping?

- Yes
- No
- Maybe

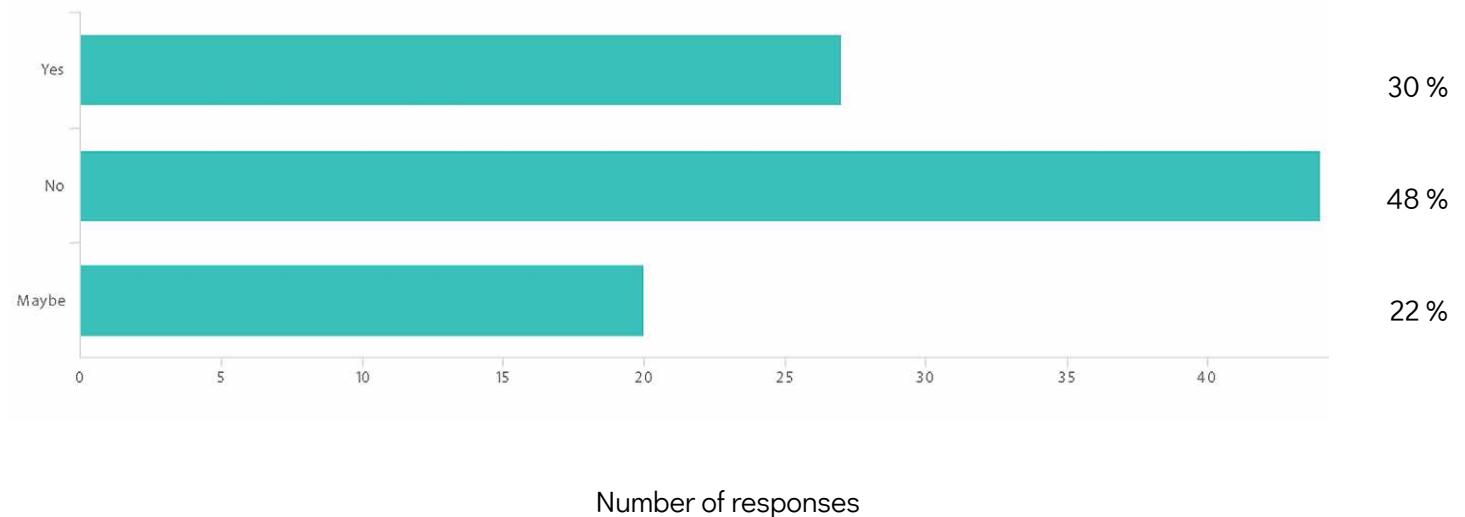
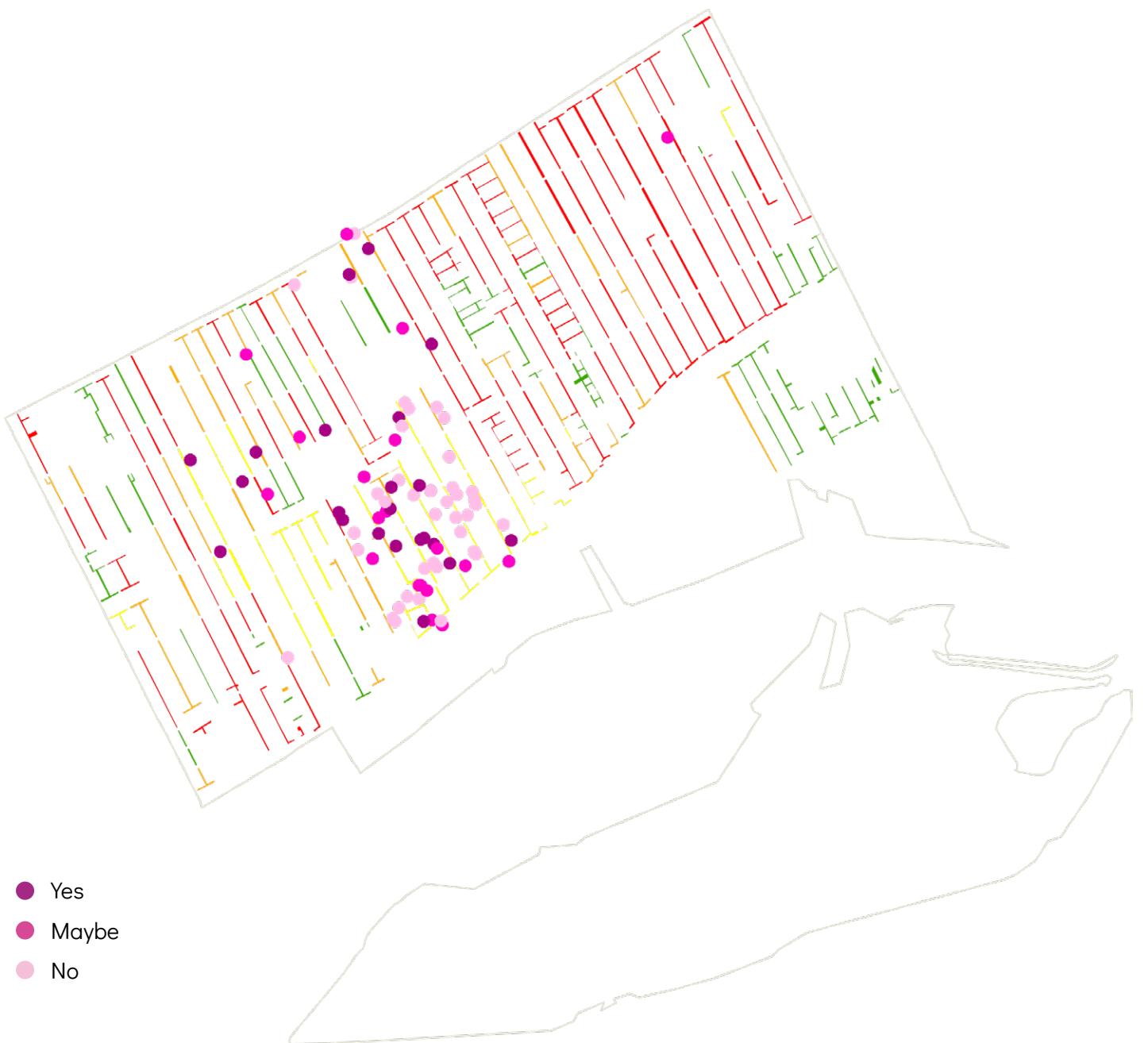


Chart 06 (above): The graph above shows the responses from 91 people, out of which majority of people (about 48%) said their alleys do not attract illegal dumping. Although about 30 % people reported trash and illegal dumping in their alleys.



How often do you use your alley?

- Daily
- 4-6 times a week
- 2-3 times a week
- Once a week
- Less frequently
- Never

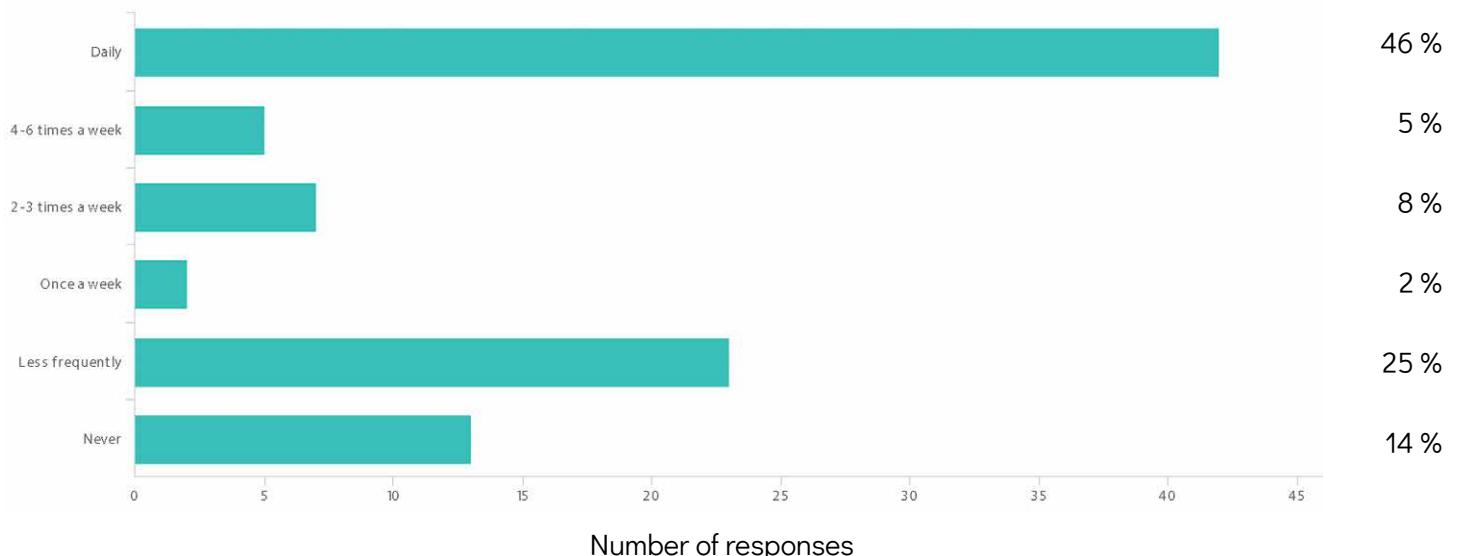


Chart 07 (above): The graph above shows the responses of people on the frequency of their alley usage. About 46% people use their alley on daily basis, which makes it very critical to address alley related issues and problems.

How do you use your alley? (select all that applies)

- Garage access (car)
- Garage access (bike)
- Garage access (walking)
- Dog walking
- Trash and recycling
- Other (please specify) _____

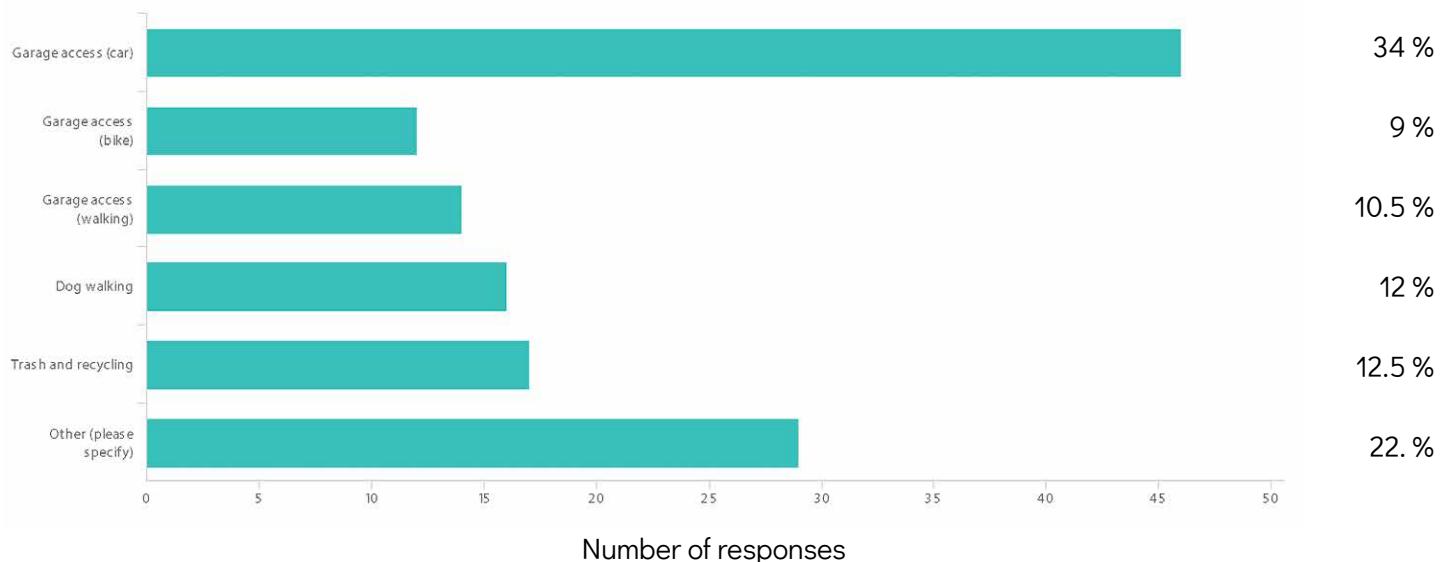


Chart 08 (above): The graph above shows responses to the question of how people use their alleys. Majority of people use the alleys for car garage access. Overall people use the alleys for multiple functions including car access, walking and dog-walking. Besides these uses, people also identified following uses of alleys:

Walking to the store, car parking, play area, back door entry way to apartment, walking to work & jogging, use the alley for car/bike/other access, access to fence surrounding our backyard, apartment move ins, off street parking for tenants and business customers, to clean, access compost bin, mulch delivery (1-2 days), keep fence in repair & alternate to street use, gardening the berm, etc

How important is it to have your alley clear?

- Extremely important
- Very important
- Moderately important
- Slightly important
- Not at all important

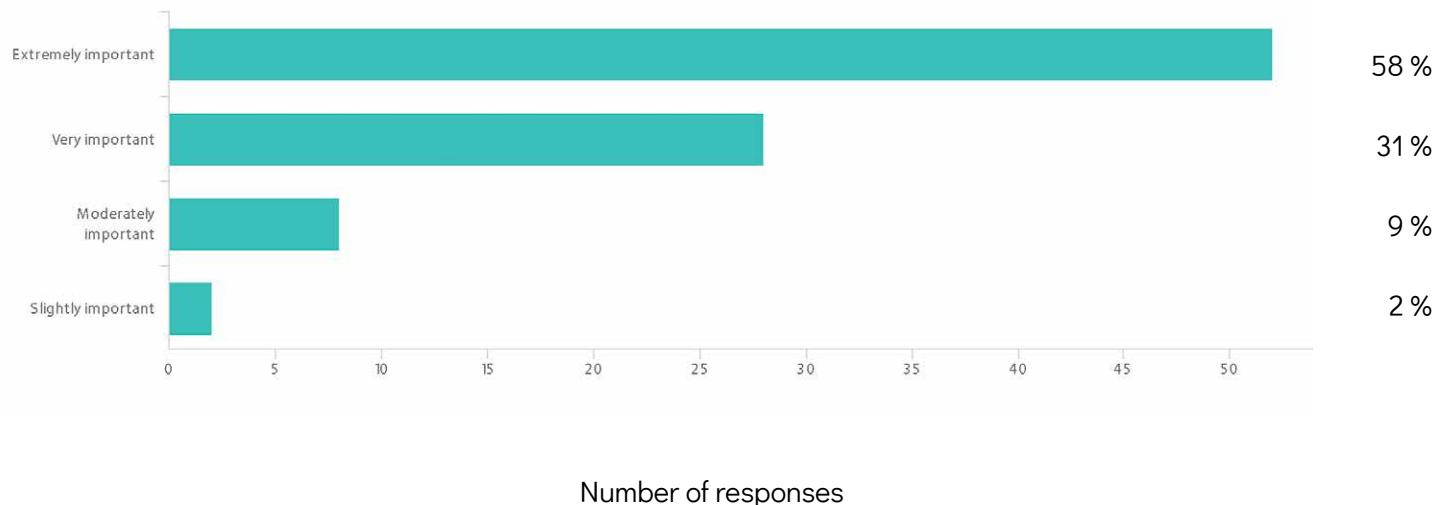


Chart 09 (above): This information was collected to know how alleys might be important to people for daily functions. For about 58% people alleys are extremely important for daily use and function.

Is your alley:

- Clean so that you can see the pavement?
- Covered with dirt
- Covered with dirt and plants
- Covered with dirt, plants and trees

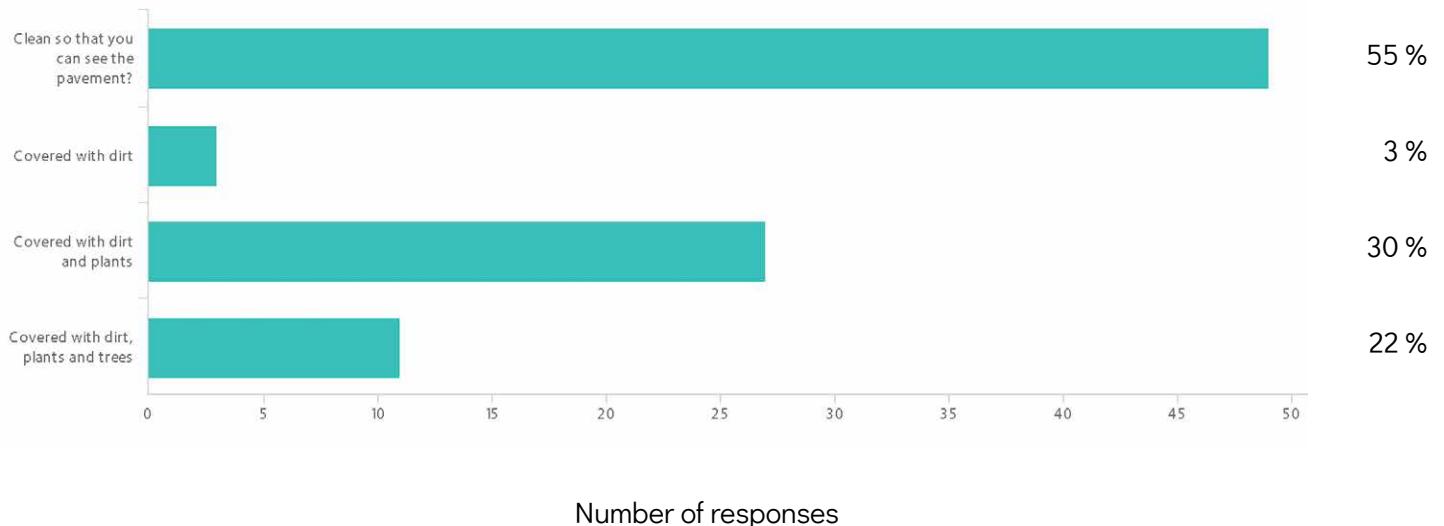


Chart 10 (above): The graph above shows information gathered regarding the cleanliness of alleys. About 55% people said that their alleys are clean enough to see the pavement. On the other hand, rest 45% people said that their alleys are either covered with dirt, overgrowth, plants or trees.

Rank the following on the basis of your preference.

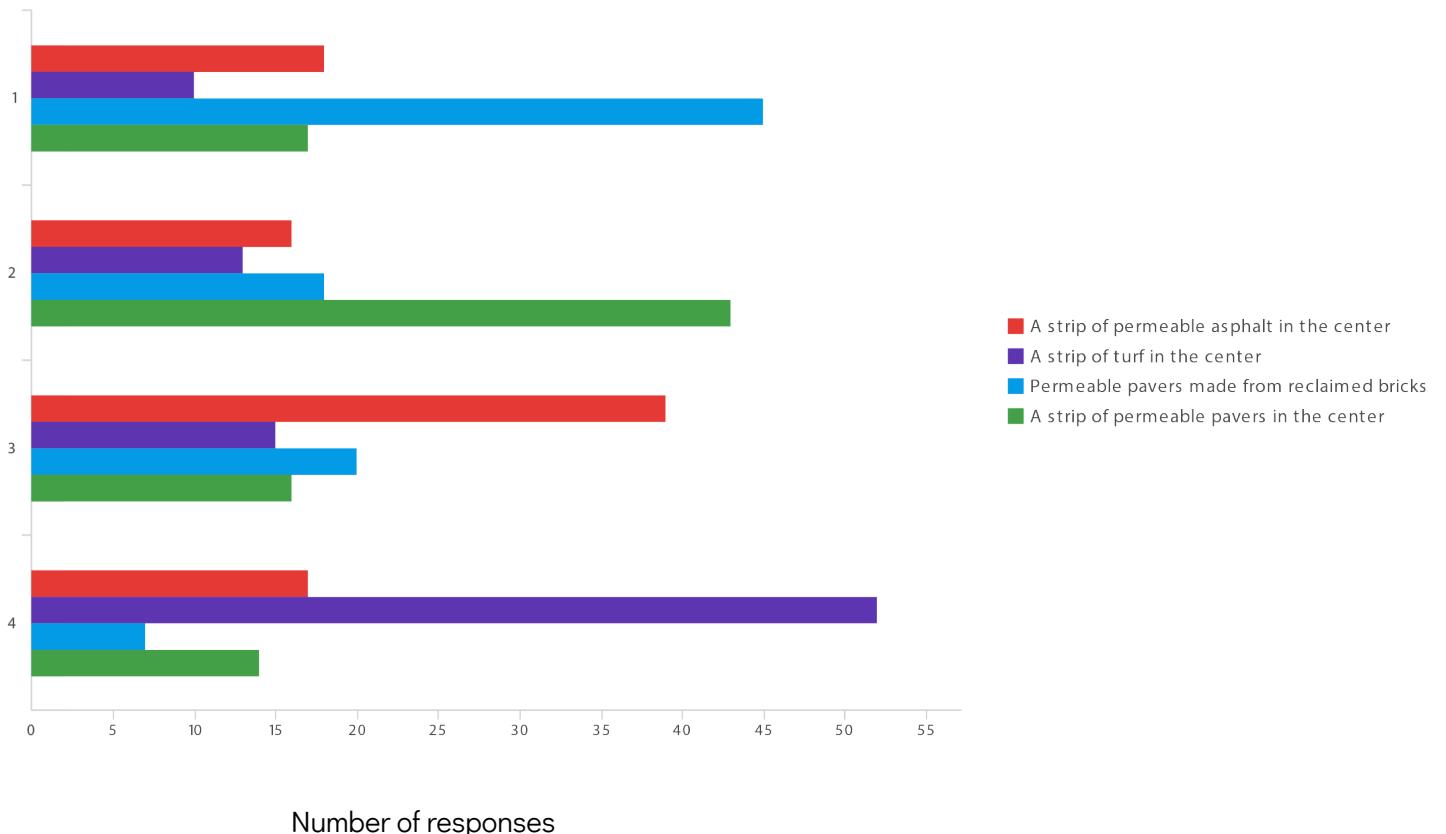


Chart 11 (above): Respondents were asked to rank the given images in order of their preference of Green Infrastructure. The most preferred option was “Permeable pavers made from reclaimed bricks” (ranking shown on the page on the right)

1. Permeable pavers made from reclaimed bricks
2. A strip of permeable pavers in the center



3. A strip of permeable asphalt in the center



4. A strip of turf in the center

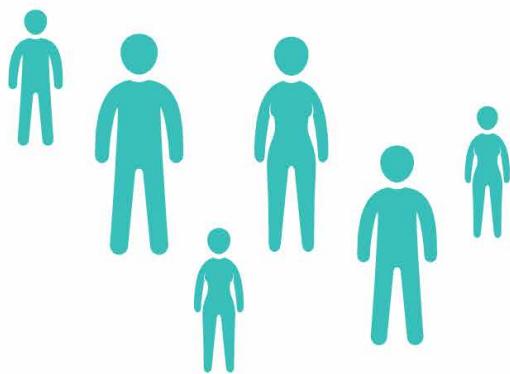


Images 79 (Upper Left), 80 (Upper Right), 81 (Lower Left), 82 (Lower Right):
The Belt on a Friday Night after work in Downton Detroit.
(Source: Green Garage Detroit, Cellcode, Natural Drainage, Inverse),

What changes would you like to make to your alley?

I would love for it to be clear as a first priority but I would also LOVE for the city to invest in green alleys and green infrastructure. Watching DWSD put a stop to the green alley project in our neighborhood has been severely disappointing as green alleys have been done all over the country and they would be a great asset here.

Fix uneven pavement - possibly to permeable materials to decrease flooding and runoff contamination to surrounding areas



I feel that the brick pavers provide part of the historic charm to our block and many people find it pleasant to walk through this alley. It would be very disappointing to lose this charming and useful brick alley.

The responses to the above question had many interesting feedback. Some examples are shown above, where people are concerned about GSI installation in their alleys, repairing sink holes and also try to restore historical brick pavers.



Chart 12 (above): The image above is a word cloud of the open ended question “What changes would you like to make to your alley?”. The responses were condensed to major concerns of the people. In the word cloud, larger the text size, more number of times people brought it up in their response as the major issue in their neighbourhood alleys.

GEO-PROCESSING MODEL

Site suitability for Green Infrastructure installation example



What, how and why?

This model was generated using ArcGIS. It is a geographic information system (GIS) for working with maps and geographic information. It is used for creating and using maps, compiling geographic data, analyzing mapped information, sharing and discovering geographic information, using maps and geographic information in a range of applications, and managing geographic information in a database.

(Source: Wikipedia definition)

Site suitability for GSI installations were processed based on landcover data, soil permeability and alley classifications based on aerial imagery. From these input parameters permeable soils area was identified with help of landcover raster information. Potential sites (alleys) were clipped in the area and further processed for selecting alleys within a buffer of 300 ft from the permeable soil area as potential GSI installation alleys.

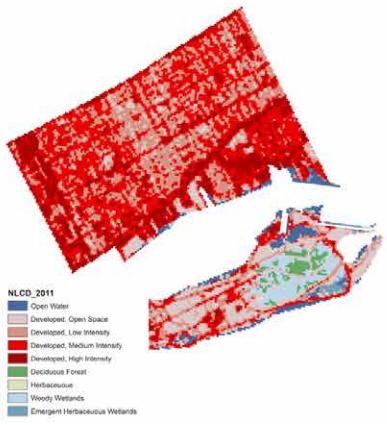
This process can be used in variations to identify site suitability. One can use hydrology factors, census data, and many other layers as required.

Map 07-12 (right): Inputs and outputs
of the geo-processing model
Source: Authors

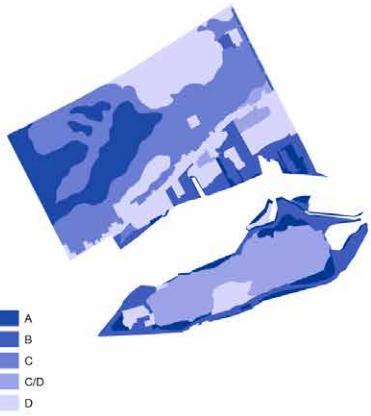
Data Source:
NLCD, NRCS Soils, USGS, GIS Open
data Michigan

Input parameters

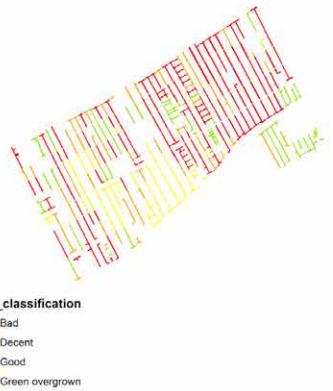
Landcover



Soil types

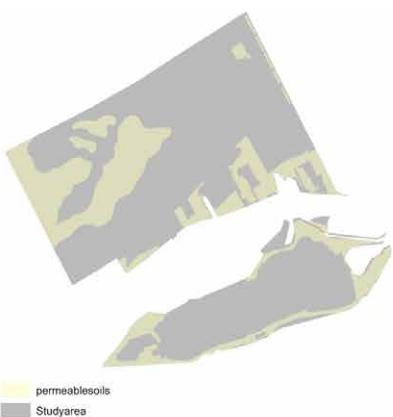


Alley condition classification



Output parameters

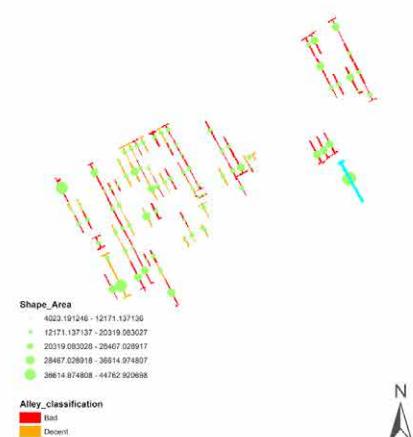
Permeable soils



Potential Sites



Site with largest area



Geo-processing model for site suitability



Shape_Area

- 4023.191246 - 12171.137136
- 12171.137137 - 20319.083027
- 20319.083028 - 28467.028917
- 28467.028918 - 36614.974807
- 36614.974808 - 44762.920698

 <all other values>

Alley_classification

- Bad
- Decent
- Studyarea

Map 13 (above): The map above shows the potential alley sites for GSI installation among bad and decent condition alleys. Also, the areas of each of these alleys are represented using dots in green of varying size with respect the surface area of the alleys.

Data Source:
NLCD, NRCS Soils, USGS, GIS Open
data Michigan

Geo-processing model for site suitability

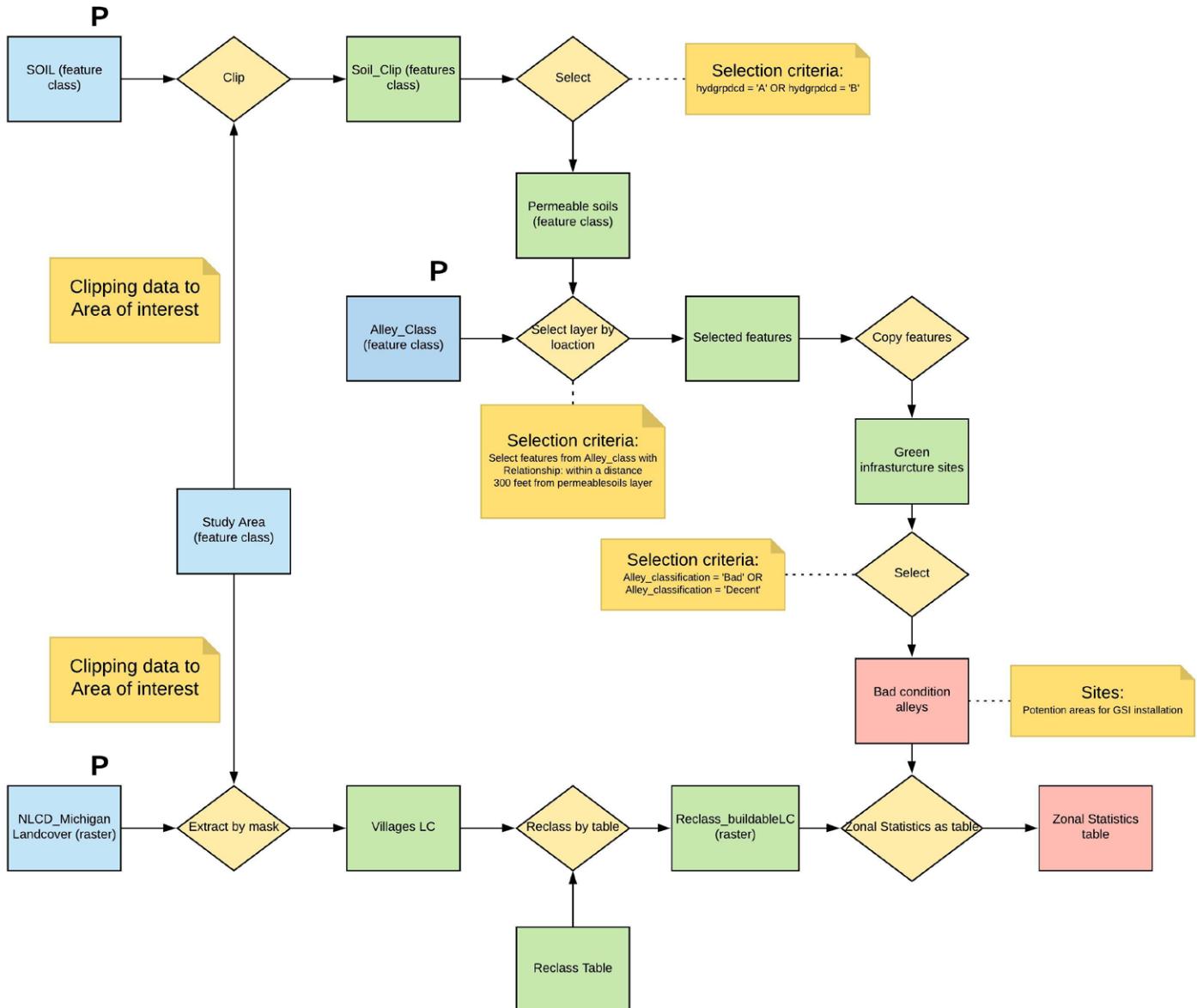


Chart 13 (above): The flowchart above shows the geo-processing steps taken to identify the sites for potential GSI installation.

ALLEY TYPOLOGIES

LOCAL ART



LIGHTING



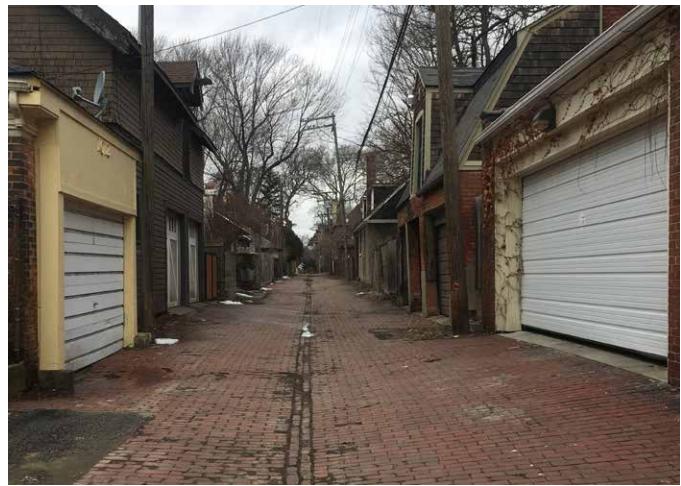
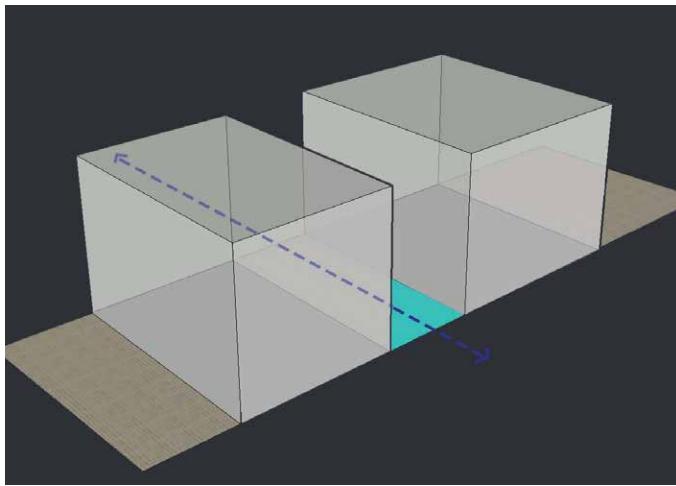
PAVING OPTIONS



REACTIVATING PROGRAMS



Images 83-86 Sources: Taylor on History, Redfin, The Nature of Cities, Daily Texan



Introduction

Various alley types and uses are found throughout the Villages area, making it challenging to categorize alleys. After a literature review, case studies and survey results, three spatial typologies were developed based on surrounding structures in the alley space: closed alley, semi-open and open alley.

According to these three typologies, ideas for improvements and changes are proposed to help develop safe, functional and exciting alley places.

Typology 1: Closed alley space

Closed alley space is defined as alley space with buildings on both sides. This typology is the most common alley space and can be found throughout the Villages. Surrounding buildings can be single-family houses, multi-family houses, and commercial buildings. For closed alley space, it is important to provide a safe environment all the time and bring people in.

First, the pavement has a significant effect on alley improvements. Different paving materials could be adopted in closed alley space. Permeable pavement is a good option to help drain stormwater. Material colors and patterns of paving help vivify the alley. Unique pavement patterns could bring character to alley space.

Second, combined with Detroit local culture, murals incorporating the arts and local character could help create an identity for the alley and invite artists, art lovers, and people to the alley. An identity for the alley

CLOSED ALLEY SPACE

Create identity for the alley by incorporating art and Local character

Unique pavement patterns bringing character to the space

Inviting new lighting fixtures bring safety atmosphere and excitement

Reactivating programs and events bring people to the alley.

Images 87-88: Semi-Open alley space typology
(Sources: Authors)

could facilitate people's bond to this space.

Third, inviting new lighting fixtures could promote safety and new excitement. Crucial to the closed alley, lighting could encourage access and discourage crimes. Lighting could be artful including choices of lighting colors and modeling could make alley space unique. Night events could also be encouraged in alley space with artistic and designed lighting.

Last but not least, reactivating programs and events attract people into the alley and help create innovative functions of alley space. Successfully reactivating programs of alley space have happened all over the world. Pearl street as an example where events like a block party, pop-up exhibitions held in the alley attracted plenty of participants from the neighborhood. Reactivating programs could also bring in attention and investment to help better improve the area.

PLANT LANDSCAPES



OPEN FACADES



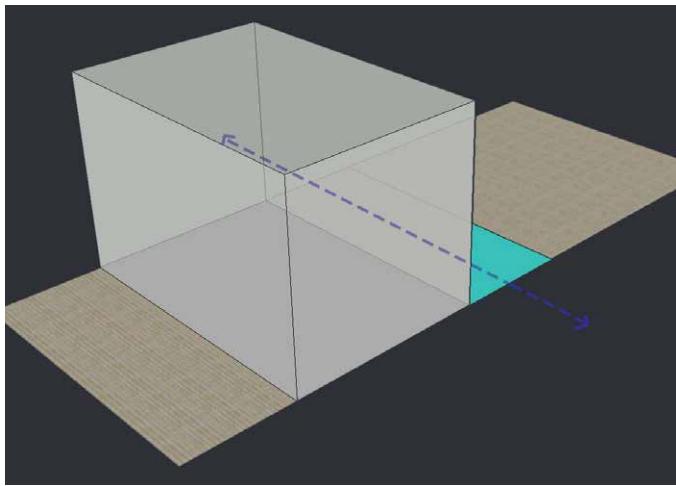
STORMWATER MANAGEMENT



OUTDOOR FURNITURES



Images 89-92 Sources: SF Planning, Nakano Associates, Detroit Environment, Fine Arts America



Typology 2: Semi-open alley space

Semi-open alley space is defined as alley space with buildings on one side. This type of alley space is common in the Villages area where vacant lands and open space are adjacent to the alley. There are various possibilities and opportunities in semi-open alley space.

First, planting trees, shrubs, vines and ornamental grasses in semi-open alley space could create both green corridors and landscape views; Plants are inviting and good for human well-being as well as air quality, water quality, providing a healthy alley space; Plants could also provide habitat for insects and birds. For alleys with limited space, potted plants and window boxes is also an option.

Second, bioswales and rain gardens could be adopted in semi-open alley space to prevent flooding problems and treat stormwater on-site. The U.S. Environmental Protection Agency (EPA) has also identified green infrastructure as a contributor to improved human health and air quality (Environmental Protection Agency, 2012). Rain gardens benefit the environment through the removal of pollutants from stormwater runoff as well as recharging groundwater supplies. Well-designed rain gardens can also improve the aesthetics of a property (and, as a result, improve property value) and provide a natural habitat for birds and pollinators (Naturally Resilient Communities, 2010).

Next, opening facades, windows and entryway could increase communication of indoor alley space. Opening facades communicate indoor and outdoor

SEMI-OPEN ALLEY SPACE

Planting trees, shrubs, vines creates green corridor and good landscape view

Rain gardens and bioswales can treat stormwater on-site and provide good view

Opening facades communicate the indoor and outdoor spaces, giving new opportunities for businesses

Outdoor furniture, lighting and seating invite people into the alley

Images 93-94: Semi-Open alley space typology
(Sources: Authors)

spaces is a good opportunity for business in alleys with commercial use. Windows can inform people of activities in the alley and creates a safer atmosphere. Entryways in the alley could be functioned as a second entry to the building, which encourages people's access and thus activates alleys.

Finally, outdoor furnitures, such as benches and table sets, can make a resting place in alley space. In commercial use alleys, outdoor furniture complements opening facades, creating a unique recreational opportunity. Benches set to landscape views offer a different kind of resting space and keep alleys from being underused.

NAME AND SIGNS



POCKET PLAZA



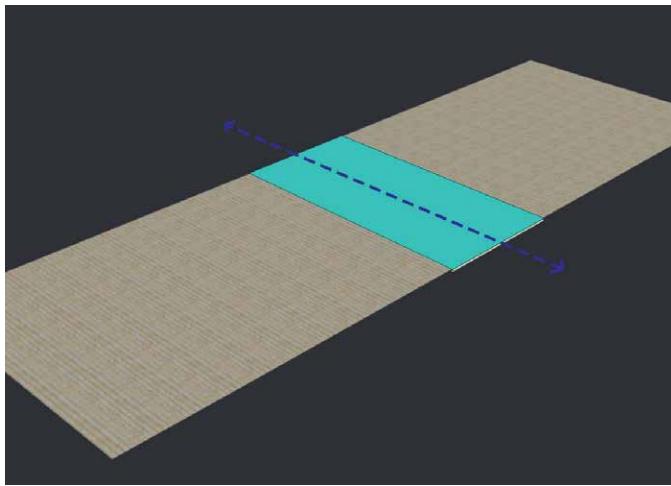
URBAN AGRICULTURE GARDENS



POCKET GARDEN



Images 93-96 Sources: State Trunk Tour, Flickr, Greening Forward, Space by Canvas



Typology 3: Open alley space

Open alley space is defined as an alley space with no immediate adjacent buildings. Open alley space is vacant for multiple opportunities to invite various kinds of enriching interactive functions.

First, an open alley space is hard to be identified as part of the alley. Adding identifiers for the alley gives meaning and sense of belonging for the community. Identity for alley space improves convenience for access, increasing the bond of a nearby neighborhood, while signages could also direct pedestrians to this destination.

Second, urban agriculture gardens can make people interact with alley space. Urban agriculture gardens could stimulate effort and contribution of neighborhood residents. Urban agriculture gardens within the alley space invite and increase the use of this space.

Small pocket gardens in an open alley space could become a gathering space and community for people or a quiet relaxing space for individuals. Similar to the urban agriculture garden, creating more space with different functions in the alley stimulate the use of alley space.

Last, pocket plazas for activities and events make alley space functional and inviting. Activities on adjacent space could spread into the alley space and make alley space exciting as well.

OPEN ALLEY SPACE

A name for alley gives meaning for an alley. Add signage directing pedestrians to destinations

Urban agriculture gardens can make people interacting with alley

Activities on the adjacent square can spread into the alley, make alley entertaining

Small pocket gardens can become quiet space for individual or gathering space for crowds

Images 97-98: Open alley space typology.
(Sources: Authors)

REFLECTION

Summary

- Understanding the Villages of Detroit for their needs, requirements and potential improvements
- Re-introducing the idea of Green Infrastructure installation in the neighborhood
- Understanding Detroit as one the rare examples where city sewer system runs under the alley ways rather than the main street system
- Case studies to learn about how many other different cities are approaching GIS installation in alleys
- Understanding the social context of the neighborhoods.
- Potentially seek policy change in the neighborhood for GSI installation in Alley ways
- Provide design typologies for different kind of alleys conditions and context
- Provide a running model / method for identifying site suitability for GIS installation which can be replicated, varied and changed for different contexts and scales.

Learnings

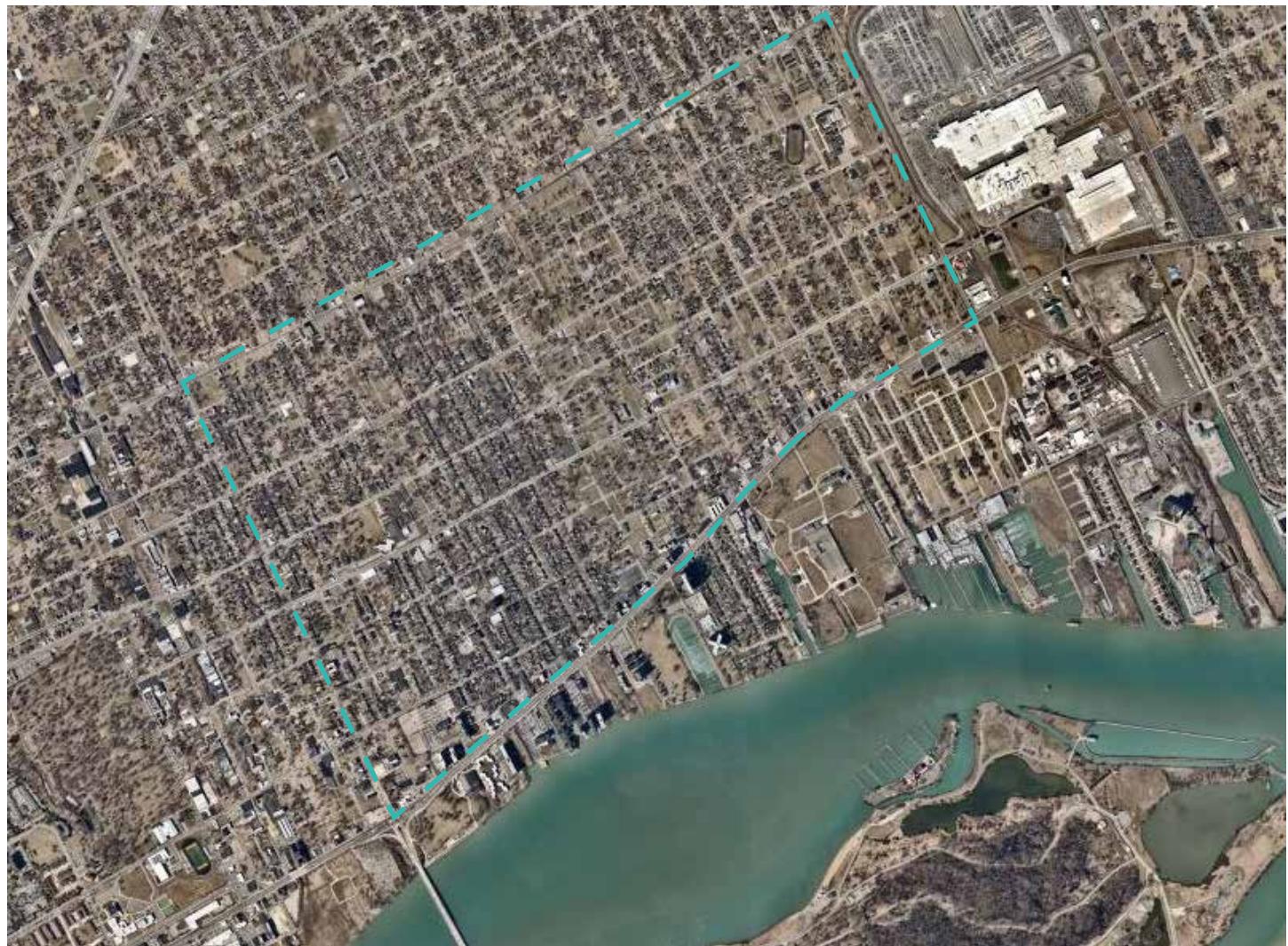
As a team of landscape architecture students, our project provided a different experience compared to our usual design projects. This project exposed us to the diverse frameworks that bound city systems and the difficulty in addressing what we see as innovations. This lesson will serve us well as we focus on sustainable practice and its implementations.

Limitations and Future work

- Current work only captured responses from the neighborhoods with less vacancy. It will be interesting to get input from other villages as well for more exhaustive feedback.
- The collected responses shows that very few people are aware about the different kinds of green infrastructure. As part of future work, there is a lot of scope to create general awareness about green infrastructure among community members. This can be done by conducting workshop or exhibits to showcase different kinds of GIS and their functionality.
- Potential policy change efforts can be made
- Community building efforts and the organizational development that will lead neighborhood revitalization.
- In order to proceed the revitalization of the alleys in Detroit, the city's unique relationship with its stormwater infrastructure places a limitation on the role of interventions that follow the requirements of DWSD.
- City framework and systems must be adaptable to meet the new design and planning innovations of the future. Conventional ideas in regulations must now adapt the urban vacancy and the future environmental scenarios the city would face.

APPENDIX

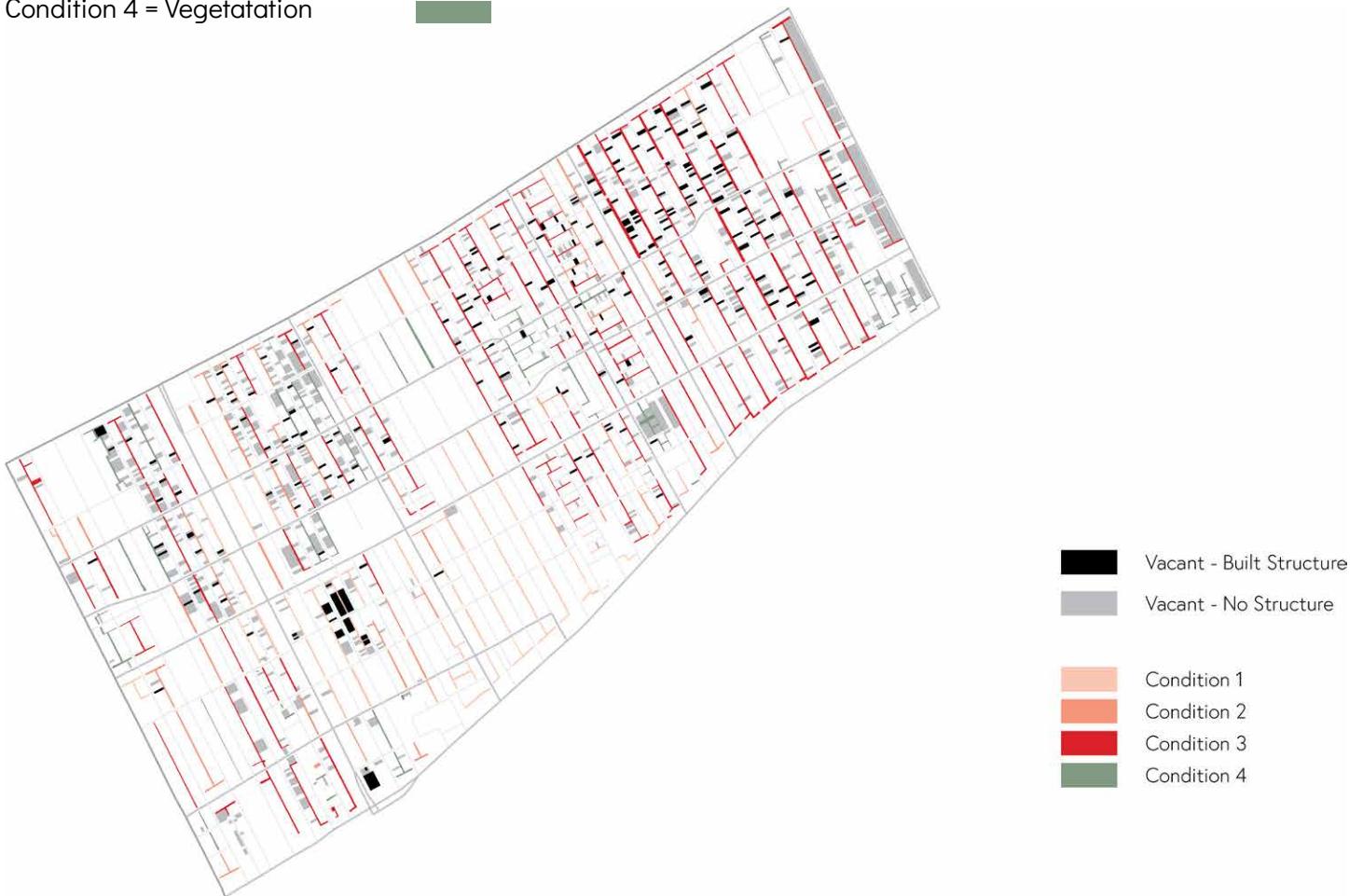
Collection of Maps



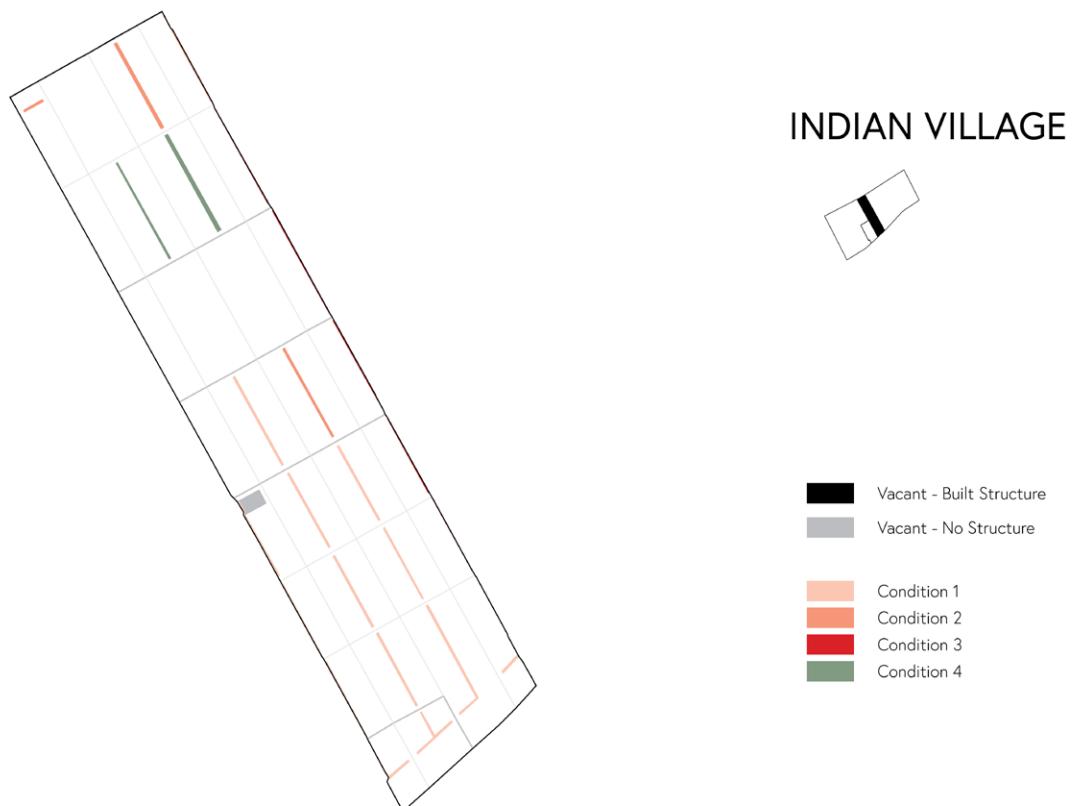
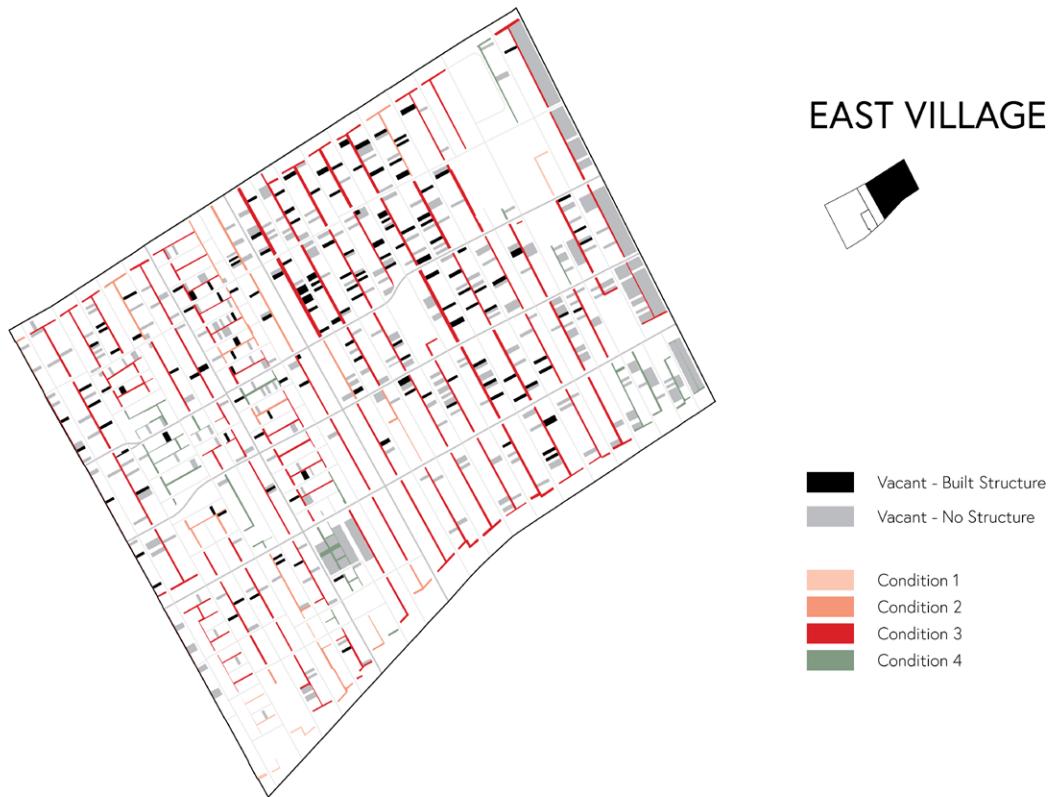
Map 14: Aerial Imagery taken from NearMap from March 2018. No existing canopy allowed the team to clearly identify alley conditions.

Vacancy and Alley Conditions

Condition 1 = Good Condition
Condition 2 = Decent Condition
Condition 3 = Bad Condition
Condition 4 = Vegetation



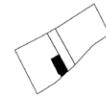
Map 15: Conditions analyzed with the additional component of existing vacancy. Vacancy is measured between Vacant - no built structure or Vacant - built structure.



Map 16-17: Analysis of each Village

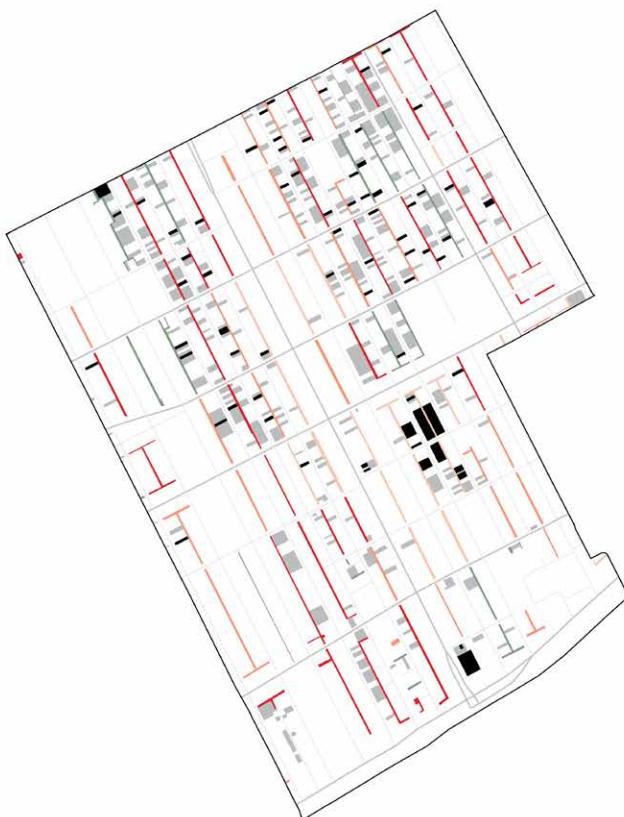


WEST VILLAGE

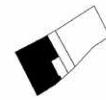


Vacant - Built Structure
 Vacant - No Structure

Condition 1
 Condition 2
 Condition 3
 Condition 4



ISLANDVIEW



Vacant - Built Structure
 Vacant - No Structure

Condition 1
 Condition 2
 Condition 3
 Condition 4

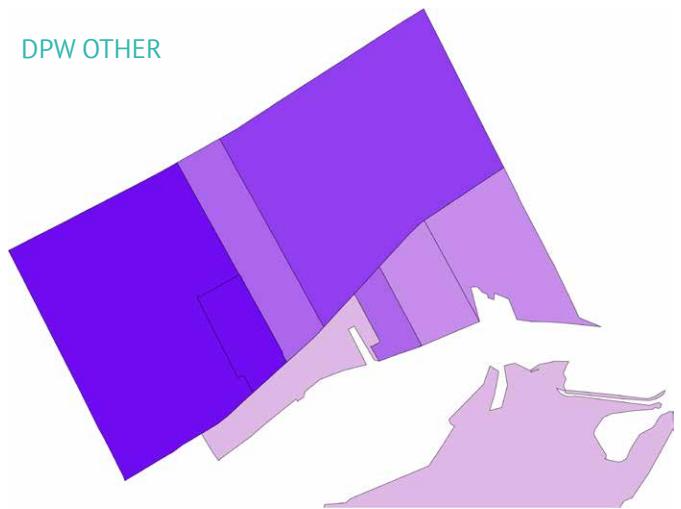
Map 18-19: Analysis of each Village

311 Service Calls

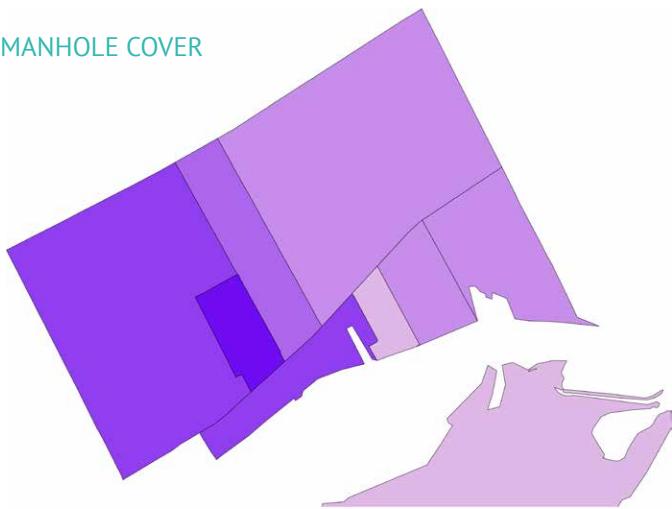
DPW DEBRIS



DPW OTHER



MANHOLE COVER



WATER IN HOME



TREE ISSUE



PARK ISSUE



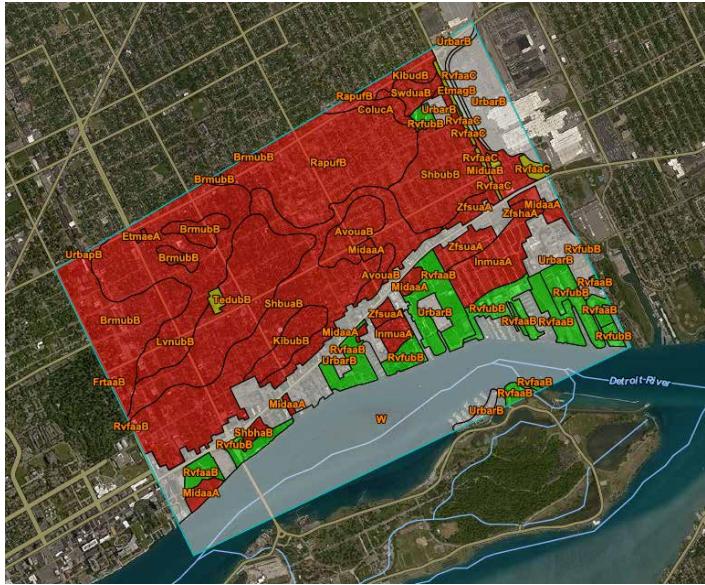
Maps 20-25: 311 Calls

Lowest Concentration
of Calls



Highest Concentration
of Calls

Soils



Slow Water Movement

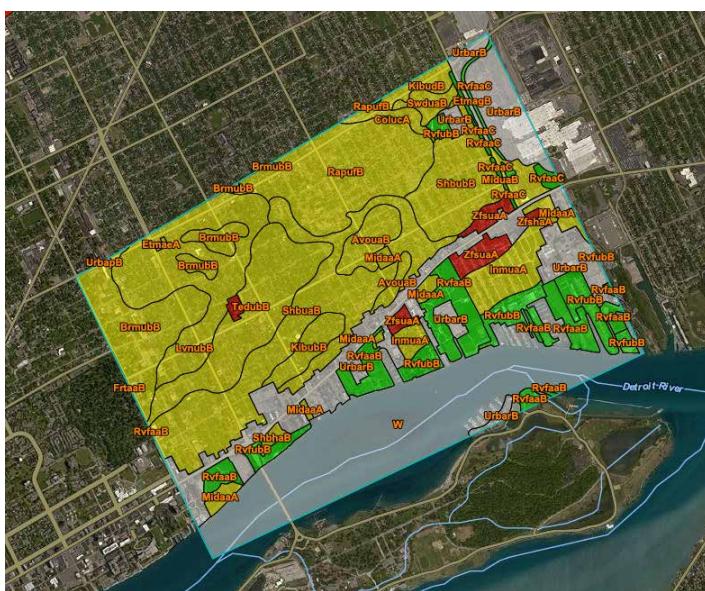
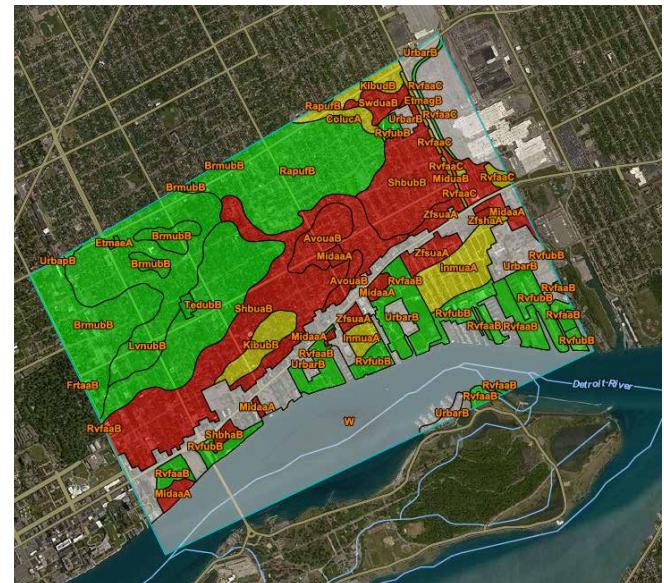
- Good
- Decent
- Poor

How well water can be infiltrated into the ground.

How well systems will be able to support stormwater management.

Surface Water Management System

- Good
- Decent
- Poor



Subsurface Water Quality

- Good
- Decent
- Poor

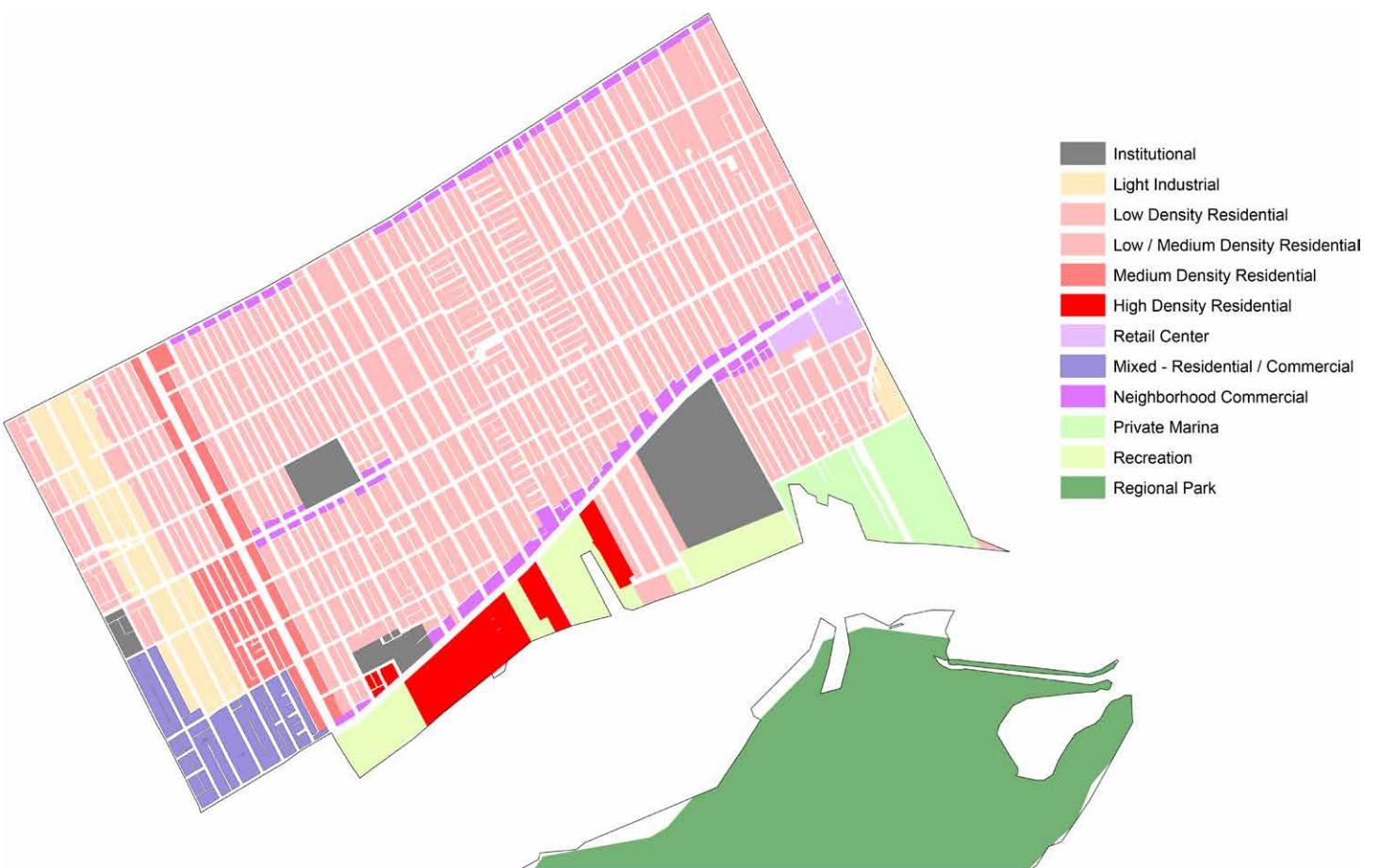
Quality of runoff of stormwater in the area.

Stormwater Utility



Map 29: Stormwater Utility Map in Relation to Worst Alley Conditions

Land Use



Map 30: Current Land Uses of the Villages

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