EVALUATING THE IMPACT OF GREEN ALLEYS ON PHYSICAL ACTIVITY: A COMPARATIVE STUDY OF BRADLEY GREEN ALLEY AND CARLISLE STREET ALLEY

A Thesis

Presented to the

Faculty of

California State Polytechnic University, Pomona

In Partial Fulfillment

Of the Requirements for the Degree Master

In

Urban and Regional Planning

By

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2025

COMMITTEE MEMBERSHIP

THESIS: EVALUATING THE IMPACT OF GREEN ALLEYS ON PHYSICAL ACTIVITY: A COMPARATIVE STUDY OF BRADLEY GREEN ALLEY AND CARLISLE STREET ALLEY

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ACKNOWLEDGEMENTS

I would first like to express my deepest gratitude to my committee chair, Dr. Nicole Lambrou, for her consistent support and invaluable guidance throughout this journey. Her expertise, encouragement, and thoughtful feedback were instrumental in shaping and completing this thesis. I am deeply grateful for her mentorship and the time she invested in my development.

I am also thankful to Dr. So-Ra Baek and Dr. Xijing Li for their advice and constructive feedback, which strengthened the quality of this thesis.

Finally, I am profoundly grateful to my family and friends for their support. To my parents and siblings, thank you for your endless love and encouragement. To my fiancé, thank you for always standing by my side, motivating me, and reminding me of what's possible – I could not have done this without you. To my son, Ryan, whose smile kept me going on the hardest days – you are my greatest joy, and I dedicate this accomplishment to you and to our future together. And lastly, a special thank you to my loyal dog, Bentley, for always being my side during countless late nights and for reminding me to take much-needed walks along the way.

ABSTRACT

As cities seek innovative approaches to improve public health and environmental resilience, green alleys offer a promising small-scale, place-based intervention. By revitalizing underutilized spaces in historically underserved communities affected by environmental injustice and limited access to parks and recreational infrastructure, green alleys can promote physical activity while simultaneously enhancing urban sustainability.

This study evaluates whether proximity to a green alley is associated with increased physical activity and alley use in two disadvantaged communities in Los Angeles County. Using a quasi-experimental comparative case study design, the research compares two demographically and spatially similar sites—Bradley Green Alley in Pacoima (revitalized) and Carlisle Street Alley in the City of San Fernando (non-revitalized). A parallel mixed-methods approach was employed, combining structured environmental and behavioral observations using the SPACES for Alleys tool with survey data from residents living within a half-mile radius of each alley. Findings reveal that residents near the revitalized alley reported significantly higher frequency and duration of alley use, particularly for walking, and perceived their environment as more accessible for physical activity. Despite these positive outcomes, safety concerns remained a prominent barrier. These results underscore the importance of integrating both physical and social dimensions of the built environment into green infrastructure planning. The study contributes to urban planning literature by providing empirical evidence of the potential for green alley revitalization to advance health equity, especially in communities with limited access to parks and open space.

Keywords: green alleys; physical activity; green infrastructure; environmental justice

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CHAPTER 1:

INTRODUCTION

In California, more than 60% of residents live in areas that do not meet the California Department of Parks and Recreation's recommendation of three acres of parkland per 1,000 residents (American Society of Civil Engineers, 2019). This shortage disproportionately impacts low-income and historically disinvested communities (Minaravesh et al., 2023), where environmental hazards and existing health inequities further limit opportunities for outdoor recreation. The World Health Organization recognized in 2012 that health disparities linked to urbanization require innovative solutions that expand access to green spaces (Weber & Schneider, 2021). With an additional 2.5 billion people expected to reside in cities by 2050, integrating urban nature through small-scale greens infrastructure, such as green alleys, becomes increasingly essential (United Nations Department of Economic and Social Affairs, 2019; Weber & Schneider, 2021).

Given the high costs, land constraints, and complex planning processes associated with traditional park development, many U.S. cities are exploring alternative strategies to expand urban green space by repurposing underutilized spaces (Wolch et al., 2014). Green alleys – formerly neglected alleyways transformed into multifunctional corridors with pedestrian-friendly infrastructure, permeable surfaces, and landscaping to support sustainability – represent a promising intervention to enhance recreational access, improve walkability, and support public health in dense urban areas like Los Angeles. Despite their potential, many alleyways continue to be stigmatized as unsafe or neglected spaces, associate with crime and illegal dumping, and neglect, rather than civic value. While green alleys have been promoted for their ecological benefits, including stormwater management and groundwater recharge (Seymour et al., 2010),

their impacts on health equity and community engagement are less understood. In Los Angeles, the limited implementation of green alley projects underscores a need for further exploration into how these interventions could address physical inactivity and inequitable urban design.

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Physical inactivity is often viewed as a personal choice, but it is significantly shaped by systemic conditions, including disparities in the built environment. Urban design influences daily movement patterns, yet many communities lack safe, accessible spaces for physical activity (Frank & Engelke, 2001; Wolch et al., 2014; Ramirez et al., 2019). In Los Angeles County, only 36% of adults meet the recommend physical activity guidelines set by the US Department of Health and Human Services (2018), according to the LA County Department of Public Health (2024). This issue is particularly higher in low-income areas, where inadequate infrastructure and limited recreational amenities underscore the need for equitable, local-scale interventions (Los Angeles County Department of Public Health, 2024; Minaravesh et al., 2023)

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While extensive research highlights the benefits of parks and large green spaces in promoting physical activity and well-being, smaller-scale interventions like green alleys remain underexplored (Weber & Scheider, 2021). Previous studies have explored community perceptions of green alleys through focus groups (Cassidy et al., 2008) and compared activity levels in revitalized versus non-revitalized alleys using observational methods (Weber & Schneider, 2021). However, previous studies have not integrated mixed-methods approaches that combine both observational and self-reported data to assess how green alley interventions influence physical activity. This study addresses that gap by employing a quasi-experimental comparative case study design to evaluate observed and self-reported physical activity patterns across two alley sites – one revitalized and one unchanged. This approach moves beyond perception-based assessments to provide empirical evidence on the potential of green alleys to

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promote active transportation in underserved neighborhoods.

This study focused on the relationship between proximity to a revitalized green alley and residents' engagement in physical activity and alley usage. Two alleyways in disadvantaged communities of the San Fernando Valley in Los Angeles County were selected for analysis: Bradley Green Alley in Pacoima, completed in October 2020, and Carlisle Street Alley in the City of San Fernando, which is scheduled for revitalization in mid-2025. Both sites experience similar socioeconomic and environmental challenges, including limited park access, making them ideal for assessing how community context influences alley use and impact.

As demonstrated in Chapter 3 through a spatial analysis and mapping of park need, the lack of access to recreational spaces in the San Fernando Valley underscores the need for localized interventions. This research aims to determine whether green alley revitalization can foster greater engagement in physical activity and community use, particularly in historically underserved areas. In addition to assessing physical activity outcomes, the findings contribute to urban planning literature by evaluating the role of alley revitalization in expanding community use and addressing longstanding health and infrastructure disparities at the local level.

This thesis is divided into six chapters. Chapter 1 introduces the research problem, emphasizing the potential of green alleys to increase recreational access and promote physical activity in disinvested communities. Chapter 2 presents a comprehensive literature review on the relationship between the built environment and physical activity, focusing on green alley revitalization as a strategy to encourage active use of public spaces. Chapter 3 details the study's research design, including site selection, research objectives, data collection methods, and study limitations. Chapter 4 presents the study's findings based on both observation and survey data, organized into three main sections: (1) demographic characteristics of survey respondents; (2)

patterns of alley use and physical activity engagement across the revitalized and non-revitalized sites; and (3) perceptions of safety and accessibility, including reported barriers and desired improvements to support physical activity. Chapter 5 interprets these results within the context of existing literature, and Chapter 6 concludes with policy recommendations for leveraging alley spaces to promote physical activity and improve equitable access to public open space in high-need communities.

CHAPTER 2:

LITERATURE REVIEW

As urban populations grow and health inequities persist, a growing body of research underscores the built environment's influence on physical, mental, and social well-being. The question is no longer whether urban design affects health, but how cities can be intentionally designed to bridge gaps in health outcome, access to safe public spaces, and environmental quality. As public health crises intersect with environmental and spatial injustices (Grant et al., 2022), planners are increasingly challenged to reimagine overlooked spaces as community assets. Expanding access to everyday public spaces that support physical activity is a key strategy for advancing health equity, particularly in communities historically excluded from public space investments (Foderaro & Klein, 2023).

While parks and large green spaces are known to support physical activity, equitable access remains a concern in low-income and racially marginalized neighborhoods (Hamstead et al., 2018). These communities often lack the green infrastructure and recreational amenities needed to support physical activity (Bantham et al., 2020). In response, attention has shifted toward small-scale, place-based interventions that can yield meaningful community benefits (Weber & Schneider, 2021; McGowan et al., 2021), such as green alleys.

This chapter examines the historical evolution of alleyways, relevant theoretical frameworks, city-led implementation efforts, and emerging research on green alley outcomes. It concludes by identifying gaps in literature, particularly the limited focus on empirical data and physical activity outcomes in underserved communities, which this study seeks to address.

2.1 The Evolution and Revitalization of Alleys

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Alleys have been integral to urban form for centuries, with use documented as far back as

432 BC (Wolch et al., 2010). Derived from the French term *allée* meaning "small street", alleys historically served utilitarian functions such as waste disposal and utility access (Ford, 2001). In the United States, alleys became more prominent in the 19th century as cities expanded using regimented grid systems that physically separated service functions from public-facing streets (Karlo, 2013).

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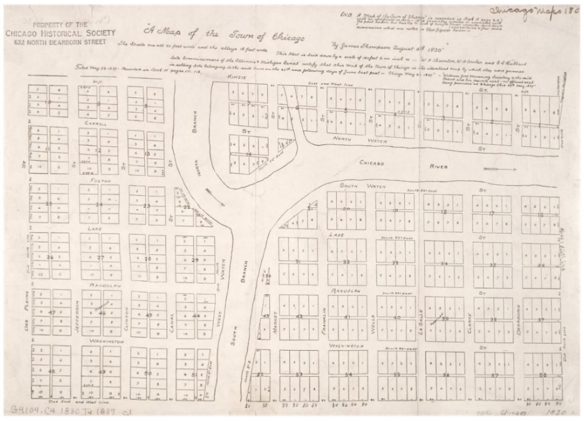
A notable example is Chicago's first plat map, created by surveyor James Thompson in 1830. As shown in Figure 1, Thompson's design included straight streets uniformly 66 feet wide with alleys 16 feet wide bisecting each block, establishing a clear distinction between public streets and service corridors (Encyclopedia of Chicago, 2005).

Figure 1
A Plan of the Town of Chicago, 1830.



Note. Created by James Thompson.
Source: Chicago Historical Society (ICHi-34284). Retrieved from Encyclopedia of Chicago (2005).

Figure 2
Chicago alley view, c. 1900.

Note. Photographer: Unknown.
Source: University of Illinois at Chicago (Metropolitan Planning Council Collection, MPC neg. 117). Retrieved from Encyclopedia of Chicago (2005).

Chicago's development pattern exemplified the emerging urban grid system in the American Midwest, where gridded blocks with streets and service alleys became the standard

(Dougherty, 2021). Following the Civil War, alley housing became prevalent among newly freed African Americans and immigrant laborers, establishing alleys within racially and socioeconomically segregated landscapes (Ford, 2001). Figure 2 illustrates a typical alley scene in 19th century Chicago, where children and families occupied narrow, crowded corridors bordered by industrial and residential structures. This imagery underscores the dual function of alleys as essential service routes and marginalized residential spaces.

By the early 20th century, alleys were increasingly stigmatized as unsafe and unsanitary – especially in low-income areas (Swope, 2024). Reformers and federal housing policies, including the 1934 Federal Housing Act and the Alley Dwelling Authority in Washington, D.C., reinforced these negative associations and targeted alley residences for removal (Frankel & Goldstein, 1995; Wolch et al., 2010). The rise of the automobile further diminished the pedestrian function of alleys (Wolch et al., 2010).

In recent decades, many cities have begun to reimagine alleys as multifunctional public spaces. Inspired by New Urbanism and green infrastructure principles, alley revitalization efforts now incorporate permeable paving, bioswales, native landscaping, improved lighting, public art, and, in some cases, exercise equipment (Newell et al., 2013; Ford, 2001; Forde et al., 2024). Cities such as Chicago, Los Angeles, Seattle, and Sacramento have embraced alley greening as a strategy to improve connectivity, stormwater management, and neighborhood livability (Karlo, 2013). In park-poor areas, green alleys offer opportunities for walking, jogging, biking, and active play (Seymour et al., 2010). As alley revitalization becomes more widespread, it is increasingly important to ground these interventions within broader theoretical frameworks. Green infrastructure theory, along with emerging research from environmental psychology, provides a foundation for evaluating how revitalized alleys may influence not only physical

conditions, but also public health, equity, and community well-being.

2.2 Theoretical Frameworks for Green Infrastructure

The U.S. Environmental Protection Agency (EPA) defines green infrastructure as a range of strategies - including rain gardens, planter boxes, green roofs, and green alleys – that utilize natural systems such as permeable surfaces, stormwater harvesting, and vegetative landscaping to manage stormwater, reduce runoff, and mitigate flooding Beyond stormwater management, green infrastructure is highly adaptable and can be designed to deliver multiple environmental, social, and economic benefits (U.S. Environmental Protection Agency, 2025).

According to Wright (2011), green infrastructure is characterized by three key dimensions: connectivity, which links green spaces into broader urban networks; multifunctionality, which supports diverse public goals; and environmental enhancement, which promotes sustainability and climate resilience (Newell et al., 2013). These principles are particularly relevant in dense urban areas, where access to restorative and safe green space is limited. Rooted in planning traditions like Olmsted's greenways and New Town planning, green infrastructure today supports environmental, social, and economic goals (Benedict & McMahon, 2002; Kambites & Owen, 2006; Mell, 2008; Wright, 2011; Newell et al., 2013).

The theoretical grounding for green infrastructure has also expanded to include the psychological benefits of nature exposure. Environmental psychology offers additional insight into how green spaces impact well-being. Stress Reduction Theory (Ulrich, 1983) implies that exposure to nature fosters automatic psychological and emotional recovery from stress. Attention Restoration Theory (Kaplan & Kaplan, 1989) suggests that natural environments help restore mental focus and cognitive capacity. Applied to green infrastructure, these frameworks provide a basis for evaluating not only physical improvements but also psychological and behavioral

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impacts of green alley interventions (Weber & Schneider, 202; Ernstson, 2012).

2.3 From Theory to Planning for Green Alleys

Translating green infrastructure principles into alley revitalization requires not only design innovation but also policy support, funding, and interagency coordination (The Trust for Public Land, 2015). In the United States, early green alley projects were often tied to stormwater funding and compliance requirements. Cities like Baltimore, Chicago, and Washington, D.C. implemented strategies such as permeable paving, bioswales, and groundwater recharge to address polluted runoff and mitigate flooding (Newell et al., 2013).

Los Angeles has emerged as a national leader in equity-focused alley revitalization. With over 900 linear miles of alleys, many of which are underutilized, the city began investing in alley transformation following the passage of Proposition O in 2004, which allocated $500 million for water quality projects (Newell et al., 2013). In 2008, the city launched a multi-agency Green Alleys Subcommittee to develop design strategies that addressed stormwater management, heat mitigation, walkability, and safety. Partners included Community Redevelopment (CRA/LA), the Bureau of Sanitation, the Department of Planning, USC's Center for Sustainable Cities, and the Trust for Public Land. This approach emphasized equity and health outcomes alongside environmental benefits, laying the groundwork for projects across the city (Newell et al., 2013).

A notable example is the Avalon Green Alley Network in South Los Angeles, which transformed six alley segments with features such as trees, fitness equipment, and community gardens (The Trust for Public Land, 2015; Newell et al., 2013). Figure 3 illustrates the Avalon South Green Alley Project, which demonstrates how targeted green infrastructure can convert neglected alleys into functional, walkable corridors. The South LA Green Alley Master Plan further expanded from this model, proposing a connected alleyway system focused on infill

development, pedestrian connectivity, and climate adaptation (Newell et al., 2013). The projects underscore the potential for green alley interventions to enhance pedestrian networks, reduce flooding, and promote active use.

Figure 3

Avalon South Green Alley Project: Before and After Implementation

Note. From the City of Los Angeles Sanitation and Environment. *Avalon Green Alley.* (n.d.).

Other examples include the East Cahuenga Cosmo Alley in Hollywood, which highlights the versatility of alley revitalization through pedestrian and commercial activity (The Trust for Public Land, 2015), and Baltimore's Alley Gating and Greening Program, which addressed safety and illegal dumping through resident engagement and alley closure (Cassidy et al., 2008). These cases illustrate how policy, community involvement, and design innovation can turn neglected infrastructure into functional public spaces.

2.4 Research on Green Alley Interventions

Although alley revitalization has expanded, research on its outcomes remains limited (Seymour & Trindle, 2014), particularly in studies that integrate parallel mixed-methods approaches to capture both quantitative and qualitative data. Existing studies often focus on behavioral observations, environmental audits, or focus groups, but seldom incorporate self-reported survey data to assess residents' experiences and perceptions. This study addresses this

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gap by applying a parallel mixed-methods framework that integrates systematic observations, structured environmental audits, and resident surveys. Qualitative notes documented during observations further contextualize social dynamics and environmental conditions that may not be fully captured through quantitative measures.

One of the most widely utilized tools in alley studies is SPACES for Alleys, a modified version of the Systematic Pedestrian and Cycling Environmental Scan (SPACES) informed by the SAGE audit framework (Pikora et al., 2002; Byrne et al., 2005; Seymour et al., 2010). This tool assesses 72 items across three domains: surroundings, substrate, and use/condition/safety. In Los Angeles, it was tested in 300 alleys using stratified sampling, with 92% of items demonstrating substantial agreement (Seymour et al., 2010). However, SPACES is limited in capturing subjective or less visible features, which this study addresses by integrating structured observations with resident data to provide a more comprehensive understanding of how revitalized alleys function as community spaces.

Table 1 provides a comparative summary of the methodological approaches, tools used, key findings, and limitations of prior studies on green alley interventions, highlighting gaps addressed in the current study.

Table 1
Summary of Green Alley Research Studies

Source	Methods	Tools Used	Findings	Limitations
Seymour & Trindle (2014)	Quantitative, Comparative	Behavioral Observations	Positive association with physical activity in revitalized alley; 91% of sessions recorded activity in the revitalized alley vs. 45% in the control site.	Lack of self-reported data to contextualize observed activity.

Ford (2001)	Mixed-Methods	Observations, Surveys, Photographic Documentation	Perceptions of alleys as unsafe; no systematic physical activity measurement.	No comparative analysis of revitalized vs. non-revitalized alleys; lack of quantitative metrics for physical activity.
Cassidy et al. (2008)	Mixed-Methods	Spatial Analysis, Physical Audits, Observations, Focus Groups, Stakeholder Interviews	Residents in under-resourced areas perceived alleys as unsafe, dirty, and prone to illegal dumping.	No comparative analysis to assess causal relationships between alley design and behavior, limited focus on physical activity.
Wolch et al. (2010)	Mixed-Methods, Participatory	Spatial Analysis, Physical Audits, Behavioral Observations, Focus Groups	Alley revitalization can enhance walkability, social connection, particularly when community voices shape implementation.	No comparative analysis of revitalized vs. non-revitalized alleys; lack of quantitative measures of physical activity.
Current Study	Mixed-Methods, Quasi-Experimental	Observations, Surveys	Evaluates physical activity engagement; comparative analysis of revitalized vs. non-revitalized alleys; integrates resident perceptions to assess community engagement and safety.	Limited generalizability, observations may not reflect seasonal variations, self-reported data bias, and non-randomized design

2.4.1 Comparative Observational Research

Seymour and Trindle (2014) conducted a comparative observational study to assess activity patterns in a revitalized alley (EaCa Alley) and a nearby non-revitalized control alley in Hollywood. Observations were conducted over 16 days, capturing data in 15-minute intervals across seven activity categories: biking, dining, driving, sitting, standing, walking, and working. Activity was recorded in 91% of observation sessions in the revitalized alley, compared to 45% in the control site (Seymour and Trindle, 2014). Walking, dining, and working were the most common activities in EaCa Alley – suggesting that design features encourage social and physical activity. While this study provided valuable insights into usage patterns, it relied solely on observational data without incorporating self-reported resident perceptions, leaving gaps in understanding motivations and subjective experiences of alley users. This study addresses this limitation by integrating both observational data and resident surveys, enabling a more comprehensive analysis of how design features influence community use and engagement.

2.4.2 Mixed-Methods Research

Ford (2001) employed a mixed-methods approach in San Diego, integrating observational data, survey responses, and photographic documentation to explore how residents in four neighborhoods perceived alleys as spaces for walking, socializing, and access. While the study provided qualitative insights, it did not assess physical activity or evaluate the impact of specific design features on behavior. Additionally, the lack of a quasi-experimental framework limited its capacity to examine differences between revitalized and non-revitalized alleys.

Similarly, Cassidy et al. (2008) employed a mixed-methods approach to assess alley use and potential for green infrastructure across Los Angeles. The study combined spatial analysis, physical audits, behavioral observations, focus groups, and stakeholder interviews to capture alley conditions and community perceptions. While spatial analysis identified areas with dense

alley networks, physical audits documented infrastructure quality and greening potential. Behavioral observations tracked pedestrian activity, vehicular traffic, and illegal dumping, and focus groups gathered resident insights on safety and potential improvements. Despite its comprehensive scope, the study did not differentiate between revitalized and non-revitalized alleys. Furthermore, the absence of a quasi-experimental framework restricted its ability to assess causal relationships between alley design and behavioral outcomes.

This study addresses these gaps by employing a quasi-experimental design that compares revitalized and non-revitalized alleys. Structured surveys further contextualize resident perceptions, facilitating a more targeted examination of how alley design influences physical activity, safety, and community engagement.

2.4.3 Participatory Research Approach

Wolch et al. (2010) adopted a participatory mixed-methods research approach, collaborating with community-based organizations to assess how alleys in low-income Los Angeles neighborhoods were utilized and perceived. The study combined spatial analysis, physical audits, behavioral observations, and focus groups to document the socio-spatial dynamics of alleys and their potential for green infrastructure. Spatial analysis mapped alley distributions and surrounding land uses, while focus groups provided qualitative insights into safety concerns and potential improvements. Although the study emphasized community engagement and qualitative data, it did not differentiate between revitalized and non-revitalized alleys or incorporate quantitative measures or surveys to assess physical activity. This study builds on this work by employing a quasi-experimental design, comparing revitalized and non-revitalized alleys, and integrating structured surveys to provide more robust evidence of the social and physical impacts of alley interventions.

2.5 Conclusion

The literature underscores the potential of green alleys to function as equitable urban interventions, delivering social, environmental, and health benefits. However, existing studies primarily rely on behavioral observations to assess physical activity within alleys, with limited integration of self-reported data or comparative analyses of revitalized and non-revitalized alleys. While some studies, such as those by Seymour and Trindle (2014) and Cassidy et al. (2008), document activity patterns and community perceptions, they do not assess how design interventions impact behavior.

This study addresses these gaps by employing a mixed-methods framework that combines self-reported survey data, structured environmental audits, and systematic observations. By incorporating both revitalized and non-revitalized alleys in a quasi-experimental design, this study provides a more comprehensive assessment of how alley infrastructure and design influence physical activity, safety, and community engagement.

CHAPTER 3:

RESEARCH DESIGN

This chapter presents the methodological framework used to examine whether green alley revitalization is associated with increased physical activity engagement and alley use among residents in two historically underserved communities in Los Angeles County. Building on the literature review in the previous chapter—which highlights the relationship between the built environment and physical activity, as well as the growing interest in green alleys as multifunctional public spaces—this study addresses a key gap by evaluating the impacts of alley revitalization on resident behavior.

The chapter begins with the site selection process, focusing on Pacoima and the City of San Fernando — two historically disinvested communities characterized by cumulative environmental burdens, limited recreational infrastructure, and high park need. The case study sites—Bradley Green Alley (revitalized) and Carlisle Street Alley (non-revitalized)—were selected based on comparable demographic and spatial characteristics, despite differences in governance.

Subsequent sections outline the research objectives, guiding hypothesis, and study population, followed by a description of recruitment strategies and data collection methods. Data sources include systematic observations using the SPACES for Alleys tool and self-reported surveys from residents living within a half-mile of each alley. The chapter concludes with a summary of measured variables and a discussion of study limitations.

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This mixed-methods design integrates quantitative and qualitative data to assess how revitalized alleys function as equitable interventions for expanding physical activity opportunities in communities with limited access to recreational space. By combining resident

perspectives with objective environmental and behavior observations, the study provides a grounded evaluation of green alley infrastructure as a strategy to promote health equity and increase physical activity in disinvested communities.

3.1 Site Selection: Pacoima and the City of San Fernando

Figure 4

Map of the City of Los Angeles, highlighting Pacoima and the City of San Fernando.

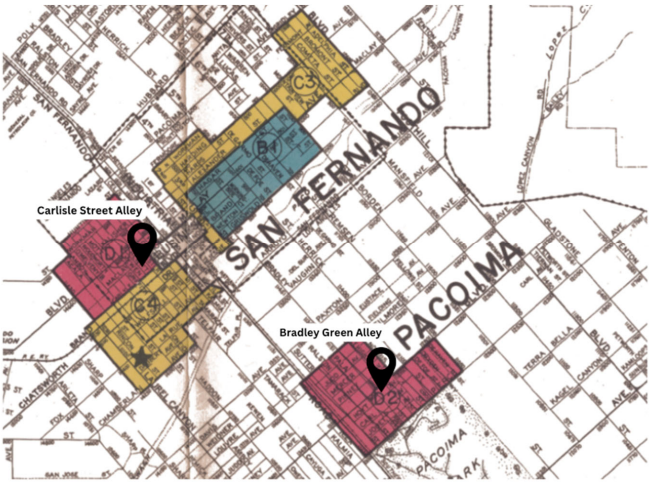
Note. Adapted from Esri, USGS, County of Los Angeles, and California State Parks.

Located in the northeastern San Fernando Valley (Figure 4), the communities of Pacoima and San Fernando share a history shaped by discriminatory planning practices, including the federal redlining policies of the 1930s (Figure 5). The Home Owners Loan Corporation (HOLC) residential maps designated these communities as "hazardous" due to their large populations of people of color, immigrants, and working-class residents, leading to decades of disinvestment

and underinvestment in public infrastructure (Liu, 2021; Nelson et al., 2023).

Figure 5

Locations of Bradley Green Alley in Pacoima and Carlisle Street Alley Redlined areas in Pacoima and the City of San Fernando, overlaid with present-day alley locations.



Note. Adopted from Nelson et al. (2023), Google Maps (2024); map overlay and annotations by author.

Today, the built environments of both communities continue to reflect the lasting impacts of redlining, with persistent disparities in infrastructure investment and access to parks and open space. Pacoima has just 0.8 acres of recreational space per 1,000 residents, while San Fernando has 1.1 acres— both significantly below the Los Angeles City average of 11.5 acres and the Los Angeles County median of 3.3 acres per 1,000 residents (Los Angeles County Department of Public Health, 2024; Neighborhood Data for Social Change, 2019). Physical activity levels reflect these disparities, with only 32.3% of adults in Pacoima and 32.4% in San Fernando meeting recommended guidelines for physical activity – both below the Los Angeles County average of 36% (Los Angeles County Department of Public Health, 2024).

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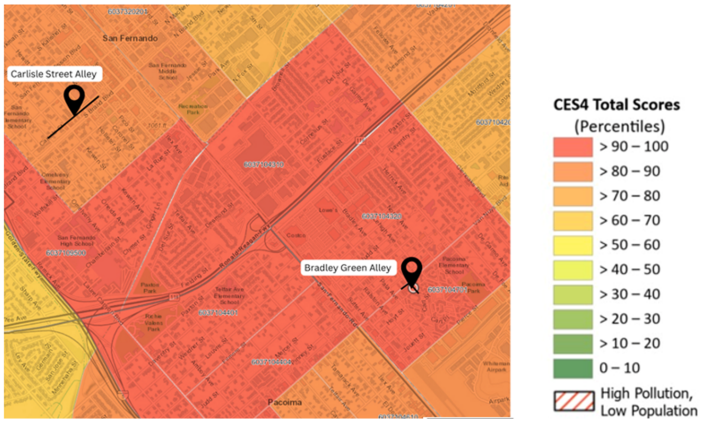
Demographically, the communities are predominantly Latino, with approximately 89% of

residents in Pacoima and over 90% in San Fernando identifying as Hispanic or Latino (Los Angeles County Department of Public Health, 2024). Median household incomes are comparable—$69,863 in Pacoima and $70,950 in San Fernando—both falling below the county median of $83,411 (Los Angeles County Department of Public Health, 2024). Educational attainment is relatively low in both areas, and many residents live below 200% of the Federal Poverty Level. Their spatial proximity, socioeconomic characteristics, and environmental conditions make Pacoima and San Fernando appropriate for a comparative case study, allowing this research to examine the potential impacts of green alley revitalization on physical activity and community use.

Environmental Context

Figure 6

CalEnviroScreen 4.0 Total Scores for Census Tracts in Pacoima and San Fernando.



Note. The map depicts total CalEnviroScreen 4.0 scores by census tract, with higher percentiles indicating greater cumulative environmental and socioeconomic burdens. Data sourced from CalEnviroScreen 4.0, OEHHA (2021). Map annotations by author.

Commented [SB16]: Add a pointer to the location of the alleys?

Both Pacoima and the City of San Fernando continue to experience environmental health challenges, shaped by cumulative exposure to pollution, limited green space, and infrastructure

conditions that contribute to elevated public health risks. Figure 6 shows the CalEnviroScreen 4.0 (CES4) scores for census tracts in Pacoima and San Fernando – a tool developed by the California Office of Environmental Health Hazard Assessment (OEHHA) to identify communities disproportionately burdened by multiple sources of pollution and socioeconomic disadvantage (California Office of Environmental Health Hazard Assessment [OEHHA], 2021). In CES4, scores range from 0 to 100, where 0 represents areas with the lowest cumulative pollution burden and least socioeconomic vulnerability, and 100 represents areas with the highest pollution burden and greatest socioeconomic disadvantage. Most census tracts in these areas fall within the 70–100 percentiles, indicating severe environmental and public health risks relative to other regions in California. These conditions make both sites critical contexts for studying green alley revitalization as a strategy to support physical activity and community use of public space.

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Pacoima is a densely populated, working-class community spanning approximately 7 square miles and home to more than 70,000 residents (Los Angeles County Department of Public Health, 2024). Recent environmental justice efforts led by organizations such as Pacoima Beautiful have brought attention to the area's chronic health challenges, including high rates of asthma, heart disease, and diabetes (Coalition for Clean Air [CCA], 2023). Proximity to major freeways, industrial facilities, and Whiteman Airport exacerbates air quality concerns, while community surveys collected between 2020 and 2022 reveal ongoing concerns about illegal dumping, noise pollution, and limited access to green space (Coalition for Clean Air [CCA], 2023).

Similarly, the City of San Fernando — while smaller in size, covering 2.37 square miles with a population of approximately 23,364 residents (U.S. Census Bureau, 2023) — faces comparable environmental stressors. The city is located near major transportation corridors,

including Interstate 5, contributing to elevated levels of ozone and particulate matter. As in Pacoima, limited access to recreational infrastructure in San Fernando may pose additional barriers to outdoor physical activity, particularly during periods of extreme heat.

Table 2 provides a comparative summary of demographic, environmental, and infrastructural indicators for Pacoima and the City of San Fernando, highlighting key similarities and differences between the two communities.

Table 2
Comparison of Study Communities: Pacoima and the City of San Fernando

Category	Pacoima	City of San Fernando
Total Population	70,084	23,324
Area (sq mi)	7 sq mi	2.31 sq mi
Population by age		
17 years and younger	24.6%	22.6%
18-64 years	65.7%	65.9%
65 years and older	9.7%	11.5%
Percent Hispanic/Latino	89.3%	91.4%
Foreign-Born Population	41.7%	36.8%
Population with Limited English Proficiency	36.0%	28.6%
Median Household Income	$69,863	$70,950
CalEnviroScreen (CES4)	70-100th percentile (High vulnerability)	70-100th percentile (High vulnerability)
Recreational space per capita (1,000 residents)	0.8 acres	1.1 acres
Adults meeting the recommended guidelines for physical activity	32.3%	32.4%
Adults with obesity	40.4%	41.7%

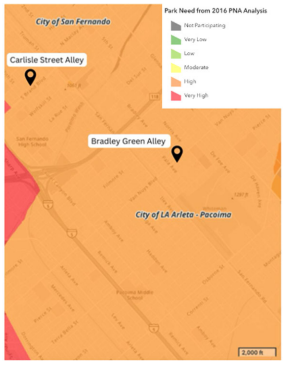
Adults reporting their neighborhood is safe from crime	53.8%	53.5%
Governance	Neighborhood within City of Los Angeles	Independent Municipality
Alley Condition at time of study	Revitalized with green infrastructure	Deteriorated conditions, no green infrastructure
Green Alley Project Status	Completed (2020)	Planned (construction anticipated 2026)

Note. Data sources from Los Angeles County Department of Public Health (2024), City of San Fernando (2024), and Pacoima Beautiful (n.d.).

Across the San Fernando Valley, residents face significant disparities in access to parks and recreational space. As shown in Figure 7, Pacoima and San Fernando are classified as areas of "high" park need according to the Los Angeles County Department of Public Health (2024). These conditions underscore the importance of small-scale public space interventions, such as green alleys, in supporting physical activity and fostering community well-being in urban environments where traditional park expansion is often unfeasible.

Figure 7

Park Need in the San Fernando Valley.

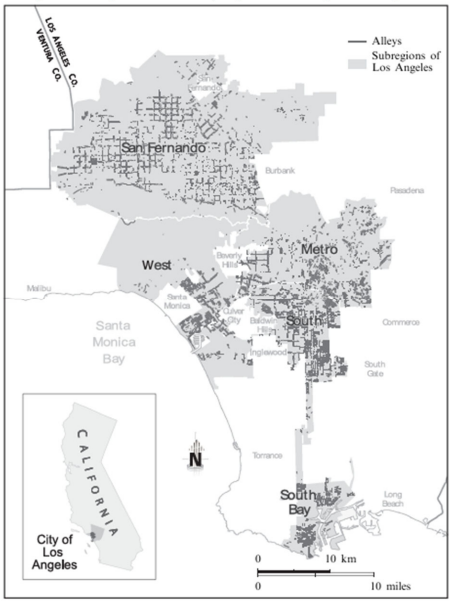


Note. Source: Los Angeles County Department of Parks and Recreation (2016). Annotations by author.

Given these conditions of limited recreational infrastructure and high park need, alleyways represent an important - yet often overlooked - opportunity to expand access to safe, active public spaces within disinvested communities. The City of Los Angeles contains an extensive network of alleys — over 12,000 segments spanning more than 930 linear miles (Figure 8) — offering significant, yet underutilized, potential for green infrastructure development. Historically overlooked in urban planning, alleys are increasingly being reimagined as multifunctional spaces that can support stormwater management, climate adaptation, and active transportation. For park-poor communities like Pacoima and San Fernando, the revitalization of alleys presents a promising strategy for creating equitable, safe, and accessible environments for physical activity and community use.

Figure 8

Alley density in the city of Los Angeles, by subregion.



Note. From *The Forgotten and Future: Reclaiming Back Alleys for a Sustainable City* (p.2882), by J.Wolch et al., 2010, *Environment and Planning A, 42*(12). https://doi.org/10.1068/a42259

3.1.1 Case Study Sites

Bradley Green Alley (Revitalized site in Pacoima, CA)

Figure 9
Bradley Green Alley in Pacoima, Los Angeles.

Note. From Trust for Public Land (n.d.)

Figure 10
Bradley Alley before the transformation.

Note. From Trust for Public Land (n.d.)

Completed in 2020, the two-block Bradley Green Alley (Figure 9) exemplifies a community-driven green infrastructure intervention in Pacoima. The project transformed a deteriorated, neglected space into a vibrant community hub designed to address local environmental challenges. Figure 10 shows the alley prior to revitalization, illustrating the deteriorated conditions that once characterized this space. Figure 11 presents the layout and design features of the Bradley Green Alley project.

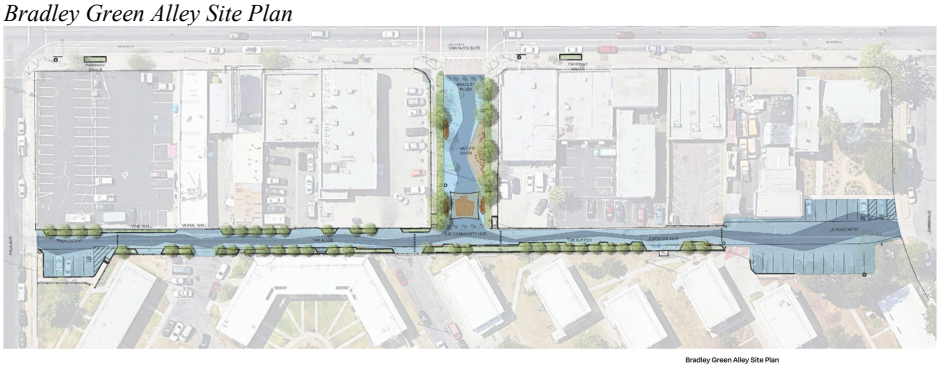
According to the UCLA Luskin Center for Innovation (2023) and RIOS design studio (n.d.), the Bradley Green Alley project incorporated several improvements, including:

- Heat-Reflective Pavement: 800 feet of alley and street improvement with specialized pavement (street bond asphalt coloring) designed to reflect heat rather than absorbing it, contributing to cooler local environment
- Lighting and Seating: Installation of 6 new streetlights funded by the local city council, 5 seating fixtures sourced locally by Angel City Lumber, and 1 shade structure to enhance usability and safety
- Greening and Stormwater Management: Planting of at least 1,000 drought-tolerant climbing vines and shrubs, as well as 46 new trees. Integration of a stormwater capture system, including catch basins, a dry well, an infiltration trench, and infiltration planter, capable of capturing up to 2 million gallons (6-acre feet) of stormwater annually
- Recreational and Social Spaces: Addition of a nature classroom, informal play areas, fitness equipment to encourage physical activity and community interaction

The project was developed through a multi-sector collaboration between Pacoima Beautiful - a grassroots environmental justice organization with deep roots in the community – alongside the Los Angeles County Department of Public Works, the City of Los Angeles Sanitation and

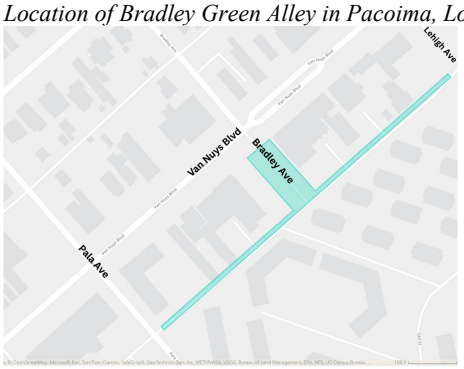
Environment (LASAN), The Trust for Public Land, and RIOS design studio. This collaborative effort reflects a comprehensive strategy to address Pacoima's environmental challenges, including poor air quality, heat vulnerability, limited access to recreational space, and stormwater management. In addition, the project was designed to strengthen social cohesion and advance environmental justice objectives within the neighborhood (RIOS, n.d.).

Figure 11
Bradley Green Alley Site Plan



Note. From RIOS design studio (n.d.)

Figure 12
Location of Bradley Green Alley in Pacoima, Los Angeles.



Note. From Pacoima Beautiful (n.d.), Esri. Annotations by author.

Located southwest of Van Nuys Boulevard between Lehigh and Pala Avenues (Figure

12), the 800 ft long by 25 ft wide alley serves as a model for small-scale infrastructure interventions that not only to improve environmental conditions but also to create a vibrant gathering space for residents of all ages (Pacoima Beautiful, n.d.).

The design integrates green infrastructure features, such as permeable pavement to reduce stormwater runoff, native and drought-tolerant landscaping, street lighting, custom locally reclaimed wood seating, a shade structure, outdoor fitness equipment, ADA accessibility features, and public art that reflects local culture and history (Pacoima Beautiful, n.d.). Additionally, Bradley Green Alley is the first planned Shared Street in the City of Los Angeles, intentionally designed to slow vehicular traffic and prioritize pedestrian safety, particularly for children and families (Trust for Public Land, 2020).

The implementation was funded by local, state, and private sources, including the Community Development Block Grant (CDBG) Neighborhood Improvement Fund (NIF), the City of Los Angeles Housing and Community Investment Department, LASAN, Los Angeles Department of Water and Power, California Natural Resources Agency, The Trust for Public Land, The Boeing Company, and the Wells Fargo Foundation (Trust for Public Land, 2020). It also served as a core component of the Transformative Climate Communities (TCC) grant, a broader climate resilience initiative led by the Green Together Collaborative (GTC)— a coalition of organizations and agencies working in Pacoima and Sun Valley (California Strategic Growth Council, 2019).

Community engagement was a central part of the planning and design process. Led by Pacoima Beautiful, residents participated in workshops to provide input on tree selection, fitness equipment, site furnishings, and the overall design of the alley. Since its completion, Bradley Green Alley has hosted environmental education workshops, exercise classes, and neighborhood

clean-ups, reinforcing its role as a community gathering space.

While Bradley Green Alley is recognized for its environmental benefits — including the infiltration of approximately 7.5 million liters (2 million gallons) of stormwater annually into local aquifers, according to Los Angeles Sanitation and Environment — there is limited empirical research evaluating its social or health-related impacts. To date, no formal studies have assessed whether green alley revitalization in Pacoima has influenced physical activity patterns, perceptions of safety, or community use. This study addresses this gap by examining how green infrastructure interventions can influence physical activity patterns, perceptions of safety, and community use in underinvested communities.

Carlisle Street Alley (Non-revitalized site in the City of San Fernando)

Figure 13

Existing Conditions of Carlisle Street Alley in the City of San Fernando, CA.

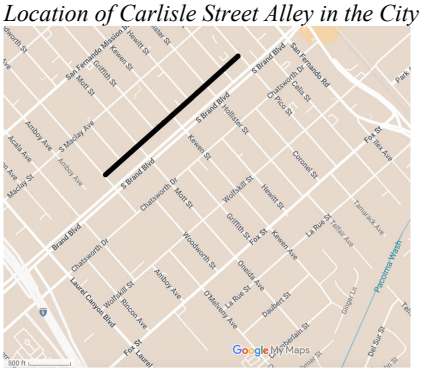
Note. Photographs taken by author (2024).

Carlisle Street Alley, the non-revitalized comparison site selected for this study, is located within a residential area in the City of San Fernando and represents the typical conditions of underutilized alley spaces in the region. Its inclusion provides a critical point of comparison to the Bradley Green Alley project, enabling this study to evaluate the potential of green infrastructure improvements to promote physical activity, community use, and perceptions of safety in disadvantaged communities.

The alley spans approximately eight blocks and is currently in a state of disrepair, characterized by potholes, cracked asphalt, and lack of clear traffic delineation (Figure 13). Extending from Pico Street to O'Melveny Avenue (Figure 14), Carlisle Street Alley serves both residential and commercial land uses. Residents regularly use Carlisle Street as an alternative north-south walking path but must compete with the permissible two-way vehicular traffic (City of San Fernando, 2024). Like Bradley Green Alley, several businesses along Carlisle Street hold small parking lots that are accessible through the alley.

Figure 14

Location of Carlisle Street Alley in the City of San Fernando.



Note. Map created by the author using Google Maps.

The alley lacks green infrastructure and is vulnerable to environmental stressors common in the region, including localized flooding during rain events and amplified heat exposure due to

its impermeable surface. Additional issues such as illegal dumping, graffiti, and safety concerns further limit the alley's usability as a space for physical activity or community gathering. Despite these challenges, there is community interest in activating Carlisle Street Alley and transforming it into an unforeseen green space. The vision for the future Green Alley originated from the Calles Verdes (Green Streets) project that started in 2017, which aimed to identify, prioritize, and green key areas of the city through community engagement and long-term land-use planning. In 2024, the City of San Fernando released a Request for Proposals (RFP) outlining plans to transform Carlisle Street into a “Green Alley” as part of its broader Calles Verdes initiative — a climate adaptation and sustainability project focused on improving public health and mobility outcomes. Per the City of San Fernando (2024), proposed design elements (Figure 15) include*:

- Removal of 34,000 square feet of asphalt
- Installation of 16,720 square feet of permeable pavers and 8,400 healthy soils
- Planting of 200 shade trees and 100 native shrubs and 200 grasses
- Mulch (100 cubic yards)
- 0.4 mile of bioswales
- Irrigation
- Sidewalk (5,640 sf)
- Curb and Gutter (2,075 LF)
- Curb Ramps with embedded Truncated Domes (26 each)
- Concrete Mini traffic circles (3 each)
- 55 Pedestrian-level lights
- Thermoplastic painted striping/markings
- Signage

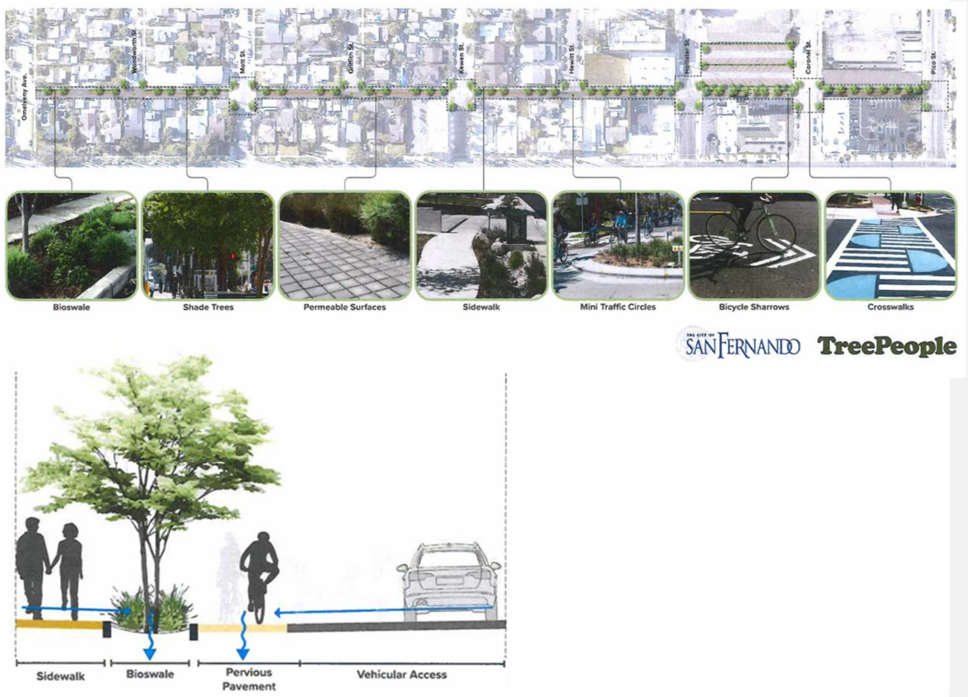
- Greening of a 52-space public parking lot (Public Lot 9)

*Project scope may be subject to change after community outreach workshops

The project has an estimated construction budget of $2.5 million, with phased design and community engagement planned through 2025. Construction is anticipated prior to the grant deadline in March 2026.

Figure 15

Proposed design elements for the future Carlisle Street Alley in the City of San Fernando, CA.



Note. From the City of San Fernando & Tree People, n.d.

At the time of this study, Carlisle Street Alley remained in its existing, non-revitalized condition, serving as a baseline for assessing potential impacts of future green alley improvements. Planned improvements for Carlisle Street Alley align with many of the design

Commented [SB18]: Can you find a design proposal for the Bradley Alley like this one? I know you have before and after images for the above case, but the overall design strategies, elements, and layout in the proposal would help visualize the overall improvements made to the earlier site, and we could compare the two schemes here if they are doing the similar approaches to the two sites.

strategies implemented at Bradley Green Alley, with a focus on stormwater management, environmental sustainability, increased access to green space, and support for active transportation.

3.2 Study Design

This study employs a quasi-experimental comparative case study design to evaluate the impact of green alley revitalization on patterns of physical activity and community use in historically underserved communities in Los Angeles County. The study compares two nonrandomized sites: Bradley Green Alley in Pacoima (revitalized) and Carlisle Street Alley in the City of San Fernando (non-revitalized).

Although Pacoima is located within the City of Los Angeles and San Fernando is an independent municipality, these two sites were selected for their comparable environmental, socioeconomic, and public health characteristics. Both communities face disproportionate environmental burdens, limited access to recreational infrastructure, and similar health disparities, making them appropriate for comparative analysis within the context of green alley revitalization. Governance differences are acknowledged as a contextual factor that may shape public infrastructure investment, maintenance practices, and community engagement strategies beyond the alley spaces themselves.

Carlisle Street Alley was selected as the control site due to its similar adjacent land uses, residential context, and role as a community passageway — despite its longer length relative to Bradley Green Alley. Importantly, Carlisle Street Alley is slated for green alley revitalization, with design and construction anticipated to begin later in 2025. Gathering data prior to revitalization offers a baseline for assessing future changes in physical activity and community use. This site pairing facilitates a meaningful comparison of alley usage patterns and behavior

while controlling for broader community-level factors.

This research design enables the assessment of whether targeted modifications to the built environment — specifically, green alley revitalization — are linked to observable differences in physical activity levels, perceptions of safety, and patterns of community use. The primary independent variable is alley condition, categorized as revitalized versus non-revitalized. Dependent variables include physical activity engagement — such as walking, biking, or jogging — as well as overall patterns of public space use, including frequency, purpose, and perceived safety. By comparing a revitalized and non-revitalized alley, this study aims to contribute to growing research on how small-scale infrastructure improvements can increase opportunities for physical activity engagement and foster greater community use of underutilized public spaces. While the alley sites represent the contextual setting for this quasi-experimental comparison, the units of analysis are the individual residents (for survey data) and the observation sessions (for environmental and behavioral data), allowing for site-specific comparisons grounded in observed and reported behaviors.

3.3 Research Objectives and Hypothesis

The primary objective of this study is to assess whether residents living near a revitalized green alley are more likely to use the alley for physical activity compared to those living near a non-revitalized alley. Dependent variables include engagement in physical activity - such as walking, biking, or jogging - as well as usage patterns defined by frequency, purpose, and context.

It is hypothesized that residents living near Bradley Green Alley (revitalized) will report higher levels of physical activity and more frequent use of the alley compared to those near Carlisle Street Alley (non-revitalized). This study seeks to answer the following research

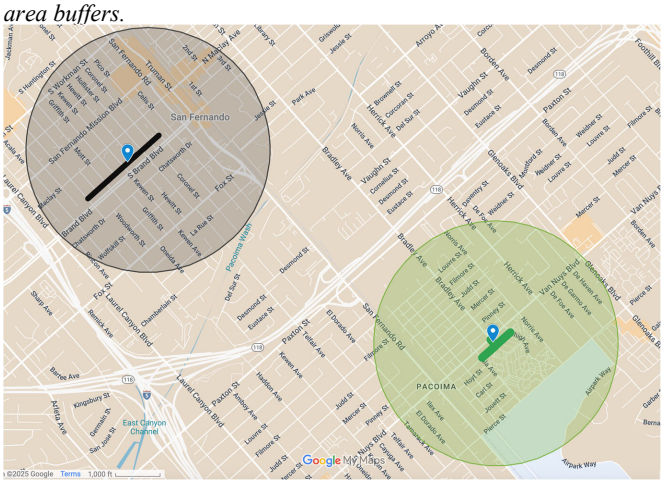
question: *Does proximity to a revitalized green alley increase residents' engagement in physical activity and frequency of alley use compared to a non-revitalized alley?*

While this study centers on alley-specific physical activity outcomes, it is recognized that other built environment features, such as sidewalk conditions, traffic, and access to parks or open spaces, may also influence physical activity patterns. However, the selected sites both directly border residential homes and apartments, providing comparable proximity to potential users. Site selection was further based on similar socioeconomic and environmental profiles to minimize contextual bias. The focus was to assess whether residents utilized the alley – as the closest available public space – for physical activity and recreation.

3.4 Study Population and Recruitment

Figure 16

Bradley Green Alley in Pacoima and Carlisle Street Alley in San Fernando, with 0.5-mile service area buffers.



Note. Map created using Google Maps and FreeMapTools powered by Esri

The study population consisted of adults aged 18 years and older residing within a half-mile radius of each alley, as shown in Figure 16. The figure maps the service areas surrounding

Bradley Green Alley (highlighted in green) and Carlisle Street Alley (highlighted in grey). Each adult resident was considered an independent eligible respondent, meaning multiple individuals from the same household could participate separately. All participants were screened for eligibility based on age and residential proximity. Recruitment efforts began upon receiving Institutional Review Board (IRB) approval and took place between February 26, 2025, and March 30, 2025 (IRB-25-11). Efforts aimed to include both individuals who actively use the alley and those who do not, ensuring a diverse range of perspectives.

Recruitment strategies were designed to promote accessibility and engage a broad and diverse range of community members. Outreach efforts included bilingual flyers (English and Spanish), door-to-door canvassing, tabling at local community events, and digital distribution via social media platforms and email lists. Flyers included a QR code that linked directly to the online version of the survey, hosted on Qualtrics - a secure online survey platform that participants could access at their convenience. In-person recruitment took place at community spaces such as local schools, senior centers, and directly within the alleyways to capture active users. Additionally, a brief informational presentation about the research was delivered at the San Fernando Gardens Community Center. The San Fernando Gardens is a 1,500- resident, World War II- era development of apartment blocks located in the heart of Pacoima (Housing Authority of the City of Los Angeles [HACLA], 2023).

Based on 2020 American Community Survey (ACS) data supplemental mapping estimates from Maps.ie. (n.d.), the population within a half-mile radius of Bradley Green Alley is about 9,843 residents and 7,230 near Carlisle Street Alley. While outreach was extended broadly across these areas, targeted recruitment focused on residents living adjacent to the alleys to maximize relevance to the study objectives. As a result, the sampling approach is best

Commented [SB19]: Insert them at the appendix if not done.

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characterized as a convenience sample, as no formal random selection procedures were applied. Approximately 400 residents per site were directly contacted through outreach methods and invited to participate. A total of 110 residents per alley completed the survey, yielding an overall response rate of 27.5%. Although the survey sample represents a small proportion of the total residential population, the data collected provide insights into patterns of use, perceptions of safety and accessibility, and physical activity behaviors in historically underserved and hard-to-reach communities.

Commented [SB21]: So how would you define your sample? Convenient sample? Any random procedure used to select who to contact?

Participation was voluntary, anonymous, and incentivized with the opportunity to enter a raffle to win a $100 Ralphs grocery gift card. The following section describes the data collection methods and tools employed to capture participant responses and observational measurements.

3.5 Data Collection and Methods

Data collection was conducted over a seven-week period between February 12, 2025, and March 30, 2025, utilizing a mixed-methods approach that integrated direct observation and survey data collection. This approach enabled the study to capture both objective assessments of alley environments and self-reported resident experiences related to physical activity and alley use.

Due to extended delays in receiving IRB approval for survey distribution, data collection began with systematic direct observations as an initial strategy to document baseline conditions and patterns of use within the study sites (IRB-25-11). Recruitment and data collection occurred simultaneously, particularly during in-person outreach efforts, allowing residents to complete surveys immediately after being recruited.

Direct observations using SPACES for alleys

Environmental and behavioral observations were conducted using the Systematic

Pedestrian and Cycling Environmental Scan for Alleys (SPACES for Alleys) tool, a structured audit instrument developed to assess built environment conditions and community use within alleyway spaces (Seymour et al., 2010). All observations were conducted by the researcher between February 12, 2025, and March 30, 2025, prior to and during the survey distribution period.

Each observation session lasted approximately 20 minutes per alley, consistent with prior applications of the SPACES for Alleys tool in Los Angeles (Seymour et al., 2010; Seymour & Trindle, 2014). To capture variability in alley use and environmental conditions, observations were scheduled across different times of day (morning, afternoon, evening) and days of the week (weekdays and weekends). Weather conditions, including temperature and precipitation, were recorded during each session to account for potential variation in activity patterns. Observations were also repeated at the same times and on the same days across multiple weeks to enhance comparability and maintain temporal consistency.

Commented [SB22]: Weather condition noted and considered as well?

The behavioral observation instrument was adapted from the original SPACES for Alleys tool (Seymour & Trindle, 2014; Seymour et al., 2010), with activity codes modified based on preliminary visits to each alley. Five primary activity codes were used: walking, jogging, bicycling, sitting, and use of fitness equipment. During each observation session, the researcher systematically walked the length of the alley, recording the activity code for all individuals observed within the space.

In addition to structured data collection, qualitative field notes were documented during each observation session. These notes captured informal or unstructured activities, social interactions, and residents' engagement with the alley environment. This qualitative component enriched the study by providing a more nuanced understanding of the lived experience within the

alley sites – capturing behaviors, social dynamics that may not be fully reflected in quantitative measures alone.

Survey administration

Surveys were administered in both English and Spanish and were available in two formats: online via the Qualtrics platform or in-person using paper surveys distributed during outreach activities. Participants had the option to complete the survey on-site during recruitment events or independently at their convenience using the online survey link accessed through a QR code provided on outreach materials.

Prior to participation, all respondents were presented with an informed consent form outlining the study's purpose, procedures, voluntary nature of participation, confidentiality protections, and contact information for the research team. For in-person surveys, a paper consent form was provided prior to survey completion. Participants who completed the survey online provided electronic consent before proceeding.

All survey responses were anonymous, and no personally identifiable information or IP addresses were collected. Participation was entirely voluntary, and respondents could withdraw from the survey at any time without penalty. Paper survey responses were securely stored and later entered in the Qualtrics platform to ensure consistency in data management and analysis.

3.6 Data Sources and Variables Measured

A mixed-methods approach was employed to capture both objective and self-reported data on alley use, physical activity engagement, and perceptions of the study sites. Data were collected from two primary sources: (1) direct observations using the SPACES for Alleys tool and (2) self-reported surveys administered to residents living within a half-mile radius of each alley site.

Observation data

The SPACES for Alleys tool provided a standardized framework for documenting environmental conditions, infrastructure characteristics, safety features, and social behaviors associated with alley use. Variables measured through environmental observations were organized across several key domains. First, *Functionality and Infrastructure* variables captured the presence and type of walking or cycling paths within the alley, the condition of paths or road surfaces, and the presence of barriers or obstructions that could impact accessibility. Next, *Safety Features* were recorded, including the presence and quality of street lighting, lighting coverage over the path area, the presence of security cameras, and the availability of directional signage or informational signage (rules, hours of use, safety information). Observations also included vehicle traffic flow within the alley, categorized as none, low, or high.

Variables related to *Physical Activity and Social Behavior* captured the total number of people observed during each session, the type of activity observed (walking, running, bicycling, commuting), and patterns of social behavior (individuals, small groups of 2–4 people, or large groups of 5 or more). Estimated demographic characteristics of alley users were also recorded, including perceived gender (male or female) and age group, categorized as children (0–12 years), teens (13–18 years), adults (19–64 years), and seniors (65 years and older).

Aesthetics and Maintenance variables assessed the cleanliness of the alley, the presence of trash receptacles, the extent of greenery or landscaping, the presence of vandalism such as graffiti, and the condition of walls or surrounding structures. Finally, *Amenities* were documented, including the presence and condition of exercise equipment, and the presence of benches or sitting areas.

In addition to structured variables (Table 3), qualitative field notes were recorded during

each observation session to capture contextual information and social dynamics not fully reflected in quantitative measures. These notes provided additional insight into informal or unstructured activities, social interactions, and residents' engagement with the alley space.

Table 3
Observation variables collected using SPACES for alleys.

Category	Variables Measured	Scale
Functionality & Infrastructure	Path type	No path Footpath Shared path – with markings Shared use path – no markings
	Path condition	Poor (a lot of bumps, cracks, holes & weeds) Moderate (some bumps, cracks, holes & weeds) Good (very few bumps, cracks, holes & weeds)
Safety Features	Presence of Streetlights	No or Yes
	Lightning Quality	Poor, Fair, or Well-lit
	Vehicle Traffic	High, Low, None
	Presence of Security Cameras	No or Yes
	Directional Signage	Not present or Present
Physical Activity & Social Behavior	Number of people & activity type	Walking, Running, Biking, Commuting, Fitness Equipment
	Social Behavior	Individuals, small groups (2-4), large groups (5+)
	Estimated age group	Children (0-12), Teens (13-18), Adults (19-64), Seniors (65+)
Aesthetics & Maintenance	Cleanliness	High amounts of trash, Some trash, Clean
	Trash Receptacles	Not present or Present
	Landscaping Presence	None, Some, or Abundant
	Presence of vandalism	Present or Not Present
Amenities	Fitness Equipment	Not present, Present (poor condition), Present (moderate condition), Present (good condition)
	Benches/Sitting Areas	Not present or Present

Respondents were asked to report their frequency of alley use (daily, a few times a week, a few times a month, rarely, or never). For participants residing near Bradley Green Alley, an additional question was included to assess whether their use of the alley had increased, decreased, or remained the same following the alley's renovation. This question was not included in the Carlisle Street Alley survey, as that site had not yet undergone revitalization. For those who reported using the alley, additional questions captured the types of activities engaged in during alley visits (walking, jogging, running, bicycling, commuting, or none), the typical duration of activity (less than 10 minutes, 10–30 minutes, or more than 30 minutes), and whether they used the alley a specific time of the day.

Survey questions also assessed patterns of social use, asking whether respondents visited the alley with family members such as parents, children, or other relatives. For participants who reported not using the alley, the survey included a checklist of perceived barriers to use, such as safety concerns, lack of lighting, lack of amenities, or lack of trees. Perceptions of the built environment were captured through a series of questions assessing perceived safety (rated on a 5-point Likert scale from very unsafe to very safe), perceived accessibility for physical activity, and desired improvements that would encourage more frequent use (e.g., better lighting, shaded areas, fitness equipment, or a cleaner environment).

Finally, the survey collected demographic information, including age group (18–34, 35–49, 50–64, 65+), gender identity (female, male, non-binary, or prefer not to say), and race/ethnicity. Additional questions asked respondents about their length of residence in the community (less than 1 year, 1–5 years, 6–10 years, or more than 10 years) and their approximate household income.

This set of survey variables provided insight into both individual physical activity

behaviors and community perceptions of the alley environments, supporting the study's mixed-methods evaluation of green alley revitalization impacts on physical activity engagement and patterns of community use. Table 4 summarizes the survey variables, organized by category, variable type, and scale of measurement.

Table 4
Survey Variables Measured

Category	Variables Measured	Scale
Physical Activity Engagement	Type	Walking, Running, Biking, Fitness Equipment
Alley Use Patterns	Frequency	Never, Rarely, Monthly/Weekly, Daily
	Purpose of Use	Walking, Running, Biking, Fitness Equipment, Commuting, None of the above
	Duration	Ratio (minutes per visit): Less than 10 minutes, 10-30 minutes, or more than 30 minutes
Perceptions of Environment	Safety	Ordinal (5-point Likert scale)
	Accessibility for physical activity	Ordinal (5-point Likert scale)
	Barriers	Nominal (multi-response: Safety concerns, Lack of lighting, Lack of amenities, None of the above)
Demographics	Age	Group 1: 18-34, Group 2: 35-49, Group 3: 50-64 Group 4: 65+
	Gender	Male, Female, Non-binary, Prefer not to say
	Race/ Ethnicity	Nominal (Hispanic or Latino, Black or African American, White, Asian or Asian American, Middle Eastern, Multiracial, Prefer not to say, Other)
	Length of Residence	Less than a year, 1-5 years, 6-10 years, Over 10 years
	Household income	Under $25,000, $25,000 - $49,999, $50,000 - $74,999, $75,000 - $99,999, $100,000 or more, Prefer not to say

3.7 Limitations of the Study

While this study provides valuable insights into the relationship between green alley revitalization, physical activity engagement, and community use, several limitations should be acknowledged.

First, the quasi-experimental comparative case study design does not allow for randomized assignment, which limits the ability to infer causality between alley conditions and physical activity outcomes. However, the selection of two sites with comparable socio-demographic and built environment characteristics helps to control for potential cofounding variables that may influence lifestyle and behavioral choices. Although recruitment efforts aimed to engage a diverse cross-section of residents living within a half-mile radius of each alley site, the final sample may not fully represent the broader community, potentially limiting the generalizability of the findings. Additionally, reliance on self-reported survey data introduces potential response biases, including recall error and social desirability bias, which may affect the accuracy of reported behaviors. To mitigate these limitations and capture a broader range of physical activity behaviors, structured systematic observations were conducted alongside the survey, allowing for the comparison of self-reported data with direct behavioral observations.

Commented [SB23]: Also by selecting two sites that are comparable in many key characteristics affecting their lifestyle and behavioral choices.

Commented [SB24]: And social desirability bias

Second, although the study focused specifically on alley use, other built environment factors - such as sidewalk quality, traffic speed and volume, bicycle infrastructure, and access to parks and open spaces- may have influenced residents' broader physical activity patters. These factors were not directly measured, and physical activity occurring outside of the alley spaces was not assessed. While efforts were made to select comparable sites based on socioeconomic and environmental profiles, unmeasured differences in the built environment could represent potential confounding factors.

Third, observational data collected through the SPACES for Alleys tool provided valuable information on activity patterns and built environment features; however, these observations represent snapshots in time and may not reflect seasonal or weather-related variations in alley use. Weather conditions including temperature and precipitation were noted during each session but were not systematically analyzed, potentially affecting activity levels, and observed behaviors. Additionally, because observations were conducted by a single researcher, there is a potential for observer bias, despite the use of a standardized observation protocol. Furthermore, it was not feasible to obtain data from multiple observers to calculate interrater reliability, limiting the capacity to assess consistency in recorded observations.

Commented [SB25]: And it was impossible to obtain data and calculate interrater reliability.

Fourth, the study recognizes the governance distinction between the two case study sites as an important contextual consideration. Pacoima, as a neighborhood within the City of Los Angeles, operates under the infrastructure systems, public services, and policies of a large metropolitan municipality. In contrast, the City of San Fernando functions as an independent city with its own governance structure and resource allocation processes. Additionally, while Carlisle Street Alley is substantially longer in length than Bradley Green Alley, this difference reflects real-world variation in urban infrastructure. The study design accounted for this by selecting sites with comparable land uses, residential settings, and neighborhood characteristics, and by limiting the survey sample to residents living within a half-mile radius of each alley. Nonetheless, alley length may influence patterns of use and resident behavior in ways that are not fully captured by the study.

Lastly, the study's geographic scope is limited to two alley sites within Los Angeles County. While the findings contribute to the growing body of research on green alley interventions, they may not be generalizable to other urban contexts, neighborhoods, or alley

projects with different design elements, community dynamics, or environmental conditions. Nevertheless, despite these limitations, the study offers insights into how alley revitalization may influence physical activity engagement and community use in historically underserved areas facing high rates of physical inactivity and obesity, where reimagining underutilized spaces is critical for promoting health equity.

3.8 Summary of Research Design

This chapter outlined the study's mixed-methods research design used to evaluate whether green alley revitalization influences physical activity and alley use in two historically underserved communities within Los Angeles County. By comparing Bradley Green Alley (revitalized) in Pacoima and Carlisle Street Alley (non-revitalized) in the City of San Fernando, the study integrates environmental observations and resident surveys to examine behavioral and perceptual outcomes. The approach provides a comprehensive framework for assessing small-scare infrastructure interventions as a strategy to promote health equity through increased access to engaging, health-supportive community environments. The findings from this study offer critical insights into how green alley revitalization may shape physical activity behaviors and perceptions of community space – key themes explored in the next chapter.

CHAPTER 4:

FINDINGS

This chapter presents the results of the data collected through surveys and systematic environmental observations adapted from the Systematic Pedestrian and Cycling Environment Scan (SPACES) tool. The findings address the study's primary research question: *Does proximity to a revitalized green alley increase residents' engagement in physical activity and frequency of alley use compared to a non-revitalized alley?*

Results are organized into three main sections: (1) demographic characteristics of survey respondents; (2) patterns of alley use and physical activity engagement across the two study sites, based on survey responses and observation data; and (3) perceptions of safety and accessibility, including desired improvements to support physical activity and reported barriers to use. Together, these quantitative and observational data sources provide a comprehensive analysis of built environment conditions, physical activity behaviors, and public space use within two historically disadvantaged communities in Los Angeles County. In addition to examining frequency and duration of alley use, the study also considers how residents' perceptions of the environment and reported barriers may shape engagement with alley spaces and influence physical activity behaviors.

4.1 Unit of Analysis

For survey data, the unit of analysis was the individual respondent living within a half-mile radius of either the revitalized Bradley Green Alley or the non-revitalized Carlisle Street Alley. Survey responses were analyzed at the individual level to assess demographic characteristics, frequency and types of physical activity engagement, frequency of alley use, and perceptions of the alley environment.

For systematic observation data, the unit of analysis was one observation session of one alley site. Each observation session recorded the presence of users engaged in various activity types (e.g., walking, biking, standing, sitting) and documented built environment conditions.

To compute overall summaries of alley use for each site, user counts from repeated observations were aggregated by time and activity type. Mean counts were computed for each alley segment based on the total number of observation scans conducted. These data were then used to generate site-specific summaries of physical activity engagement and patterns of use within the revitalized and non-revitalized alley settings.

4.2 Survey Respondent Characteristics

This section summarizes the demographic characteristics of survey respondents across both study sites. A total of 220 residents participated in the survey, with an equal number of respondents (n = 110) recruited from residential areas within a half-mile radius of each alley site to ensure balanced representation and facilitate appropriate comparisons between the revitalized (Bradley Green Alley) and non-revitalized (Carlisle Street Alley) sites.

Figure 17
Age, gender, and Hispanic/Latino identity by site

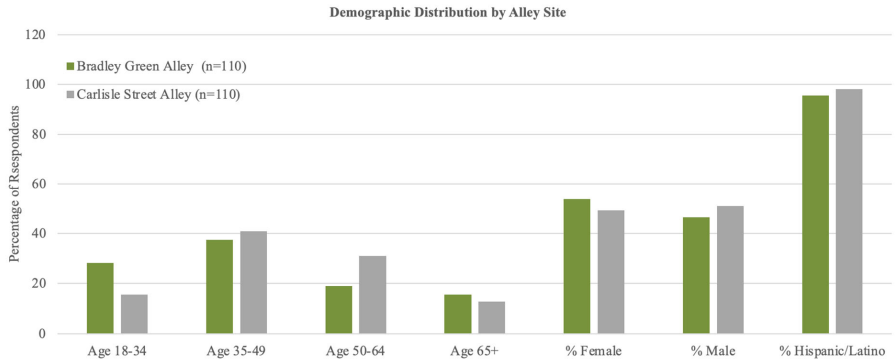


Figure 17 presents the age distribution, gender, and Hispanic/ Latino origin of respondents by alley site. Figure 18 summarizes the length of residence in the study area, indicating levels of residential stability across both study areas.

Figure 18
Length of residence by alley site

Demographic Comparability of Study Samples

Before comparing activity outcomes across sites, it was necessary to establish whether the two study samples were demographically comparable. Chi-Square Tests of Independence were conducted for age group, gender, and race. The age distribution between respondents near Bradley Green Alley and Carlisle Street Alley did not significantly differ, $\chi^2(3, N = 220) = 7.63$, $p = .054$, supporting demographic comparability for this variable. Similarly, no significant difference was found in gender distribution, $\chi^2(1, N = 220) = 0.46$, $p = .500$, indicating comparable proportions of male and female respondents across sites. Racial composition also not significantly differ between the two groups, $\chi^2(3, N = 220) = 1.71$, $p = .635$, although small sample sizes in some race categories warrant cautious interpretation. Lastly, length of residence in the community was not significantly different, $\chi^2(3, N = 220) = 4.16$, $p = .245$. Collectively, these findings suggest that the two samples were demographically similar across key

characteristics, supporting the validity of cross-site comparisons in subsequent analyses of physical activity engagement and alley use.

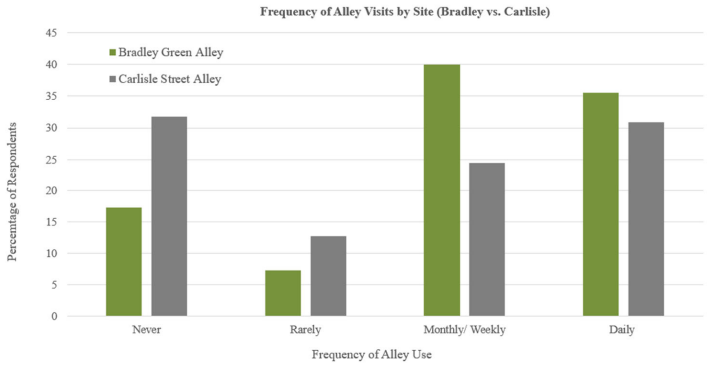
4.3 Patterns of Alley Use and Physical Activity Engagement

This section presents the study findings related to patterns of alley use and physical activity engagement across the two study sites. Survey responses were used to capture residents' frequency of alley visits, duration of visits, and purposes of use. Additionally, systematic observations conducted using the SPACES for Alleys tool provided complementary data on observed physical activity behaviors and environmental conditions across both sites.

4.3.1 Frequency of Alley Visits

Figure 19 presents a visual comparison of alley use frequency across sites based on survey responses showing a higher proportion of residents near Bradley Green Alley reported daily alley use (35.5%) compared to Carlisle Street Alley (30.9%). Conversely, a larger proportion of residents near Carlisle Street Alley reported never using the alley (31.8%) relative to residents near Bradley Green Alley (17.3%).

Figure 19
Frequency of Alley Visits by Site (Bradley Green Alley vs. Carlisle Street Alley) based on survey responses



To assess the association between alley condition and frequency of alley visits, a Gamma test and Kendall's Tau-b test were conducted, given the ordinal nature of the frequency variable. The statistical analysis revealed a complex relationship between alley condition and usage frequency. The Gamma test indicated a statistically significant negative association between alley condition and frequency of use ($\gamma = -0.226$, $p = .026$). This negative value suggests that residents near Carlisle Street Alley (non-revitalized) were slightly more likely to report lower usage frequencies (e.g., "Never" or "Rarely"), while those near Bradley Green Alley (revitalized) were more likely to report higher usage frequencies (e.g., "Daily" or "Monthly/Weekly"). However, the interpretation of these findings is complex. Despite the revitalization of Bradley Green Alley, the observed negative coefficients indicate that higher usage frequencies were slightly more common in the non-revitalized alley. This unexpected pattern may reflect underlying differences in resident perceptions, accessibility, or other contextual factors not directly assessed in the survey.

The Kendall's Tau-b test further supported these findings, indicating a weak but statistically significant negative association ($\tau b = -0.138$, $p = .026$). This consistent pattern across both tests suggests that the relationship between revitalization and alley use frequency is more nuanced than initially hypothesized.

Observation data provided additional context to these findings. Observations were conducted on consistent weekdays (Monday, Wednesday, Friday afternoons) across both sites to maintain comparability. Despite the statistical analysis suggesting slightly higher usage frequencies in the non-revitalized alley, direct observations consistently indicated higher pedestrian activity and greater overall use in Bradley Green Alley. In contrast, Carlisle Street Alley exhibited lower activity levels and less community engagement.

This discrepancy highlights the potential influence of contextual factors, such as perceptions of safety or accessibility, on self-reported use patterns. These findings underscore the importance of integrating both quantitative and qualitative measures to capture a more comprehensive understanding of the impact of revitalization on public space utilization.

4.3.2 Duration of Visits

To assess differences in the length of time participants spent in each alley during a typical visit, the analysis was limited to survey respondents who reported using each alley. Respondents who indicated that they "never" used the alley were excluded from this analysis to ensure that comparisons reflected only active alley users at each site. Survey respondents were asked to indicate the typical duration of their alley visits by selecting one of three options: (1) less than 10 minutes, (2) 10–30 minutes, or (3) more than 30 minutes.

Commented [SB26]: Present the descriptive statistics by group first. If it was mentioned before, I think it should be moved here or re-discussed. What is mean, sd? And a sample size in each group needed as those answered never was excluded.

For Bradley Green Alley (n = 91), the mean duration category was 2.00 (SD = 0.737), corresponding to approximately 10-30 minutes. The standard deviation indicates moderate variability, suggesting a diverse range of visit durations. While the average duration aligns with 10-30 minutes, the spread of responses indicates that some users spent less than 10 minutes (category 1) and others more than 30 minutes (category 3). The slightly higher variability in Bradley Green Alley compared to Carlisle Street Alley suggests a more heterogeneous pattern of visit durations.

For Carlisle Street Alley (n = 75), the mean duration category was 1.47 (SD = 0.684), indicating a typical visit duration of less than 10 minutes. The lower standard deviation reflects more consistent patterns of brief visits, with fewer responses falling into the longer duration categories (2 or 3).

A Shapiro-Wilk test indicated that duration data were not normally distributed for either

site ($p < .001$). Therefore, the non-parametric Mann-Whitney U test was employed to compare visit durations between the two sites.

Results from the Mann-Whitney U test (Table 5) revealed a statistically significant difference in visit durations between sites. Respondents living near the revitalized Bradley Green Alley reported significantly longer visit durations (Mean Rank = 97.86, n = 91) compared to those near the non-revitalized Carlisle Street Alley (Mean Rank = 66.08, n = 75), $U = 2106.00$, $z = -4.576$, $p < .001$. These findings suggest that the revitalized alley may provide features that encourage longer stays, such as improved accessibility, enhanced comfort, or additional amenities.

Table 5
Mann-Whitney U Test Results for Duration of Alley Visits by Site

Site	n	Mean Rank	Mann-Whitney U	p-value
Bradley Green Alley	91	97.86		
Carlisle Street Alley	75	66.08		
			U = 2106.000	
				p < .001

Note. Mann-Whitney U test was used due to violation of normality assumptions (Shapiro-Wilk p <.001). Mean rank values represent the average rank of duration of visits within each site.

4.3.3 Purpose of Alley Use

A Chi-square Test of Independence was conducted to examine whether the reported purpose of alley use differed significantly between Bradley Green Alley and Carlisle Street Alley. Respondents were able to select multiple purposes of alley use, including walking, running or jogging, bicycling or using a scooter, commuting through the alley as a cut-through for transportation, and using fitness equipment (available only at Bradley Green Alley). Respondents also had the option to select “none of the above;” however, this response was not selected by any of the respondents who reported using the alleys. Participants who indicated that

they never used the alley were excluded from this analysis. The Chi-square test compared the frequency of each reported purpose across the two sites to determine whether patterns of alley use varied significantly based on site characteristics. A summary of all reported purposes of alley use across sites is presented in Table 6.

Commented [SB27]: ? I don't see it from Table 5...

Commented [SB28R27]: You meant Table 6?

Table 6

Reported Purposes of Alley Use by Site (Bradley Green Alley vs. Carlisle Street Alley)

Purpose of Use	Total %	Bradley %	Carlisle %	χ^2(df)	p-value
Walking	57.2%	65.9%	46.7%	6.24 (1)	.013
Biking/Scooter	15.1%	18.7%	10.7%	2.07 (1)	.151
Running/Jogging	4.2%	6.6%	1.3%	2.82 (1)	.093
Commuting	72.9%	72.5%	73.3%	0.01 (1)	.907
Fitness Equipment	N/A	11.0%	N/A	Not tested	N/A

Note. Percentages reflect the proportion of respondents who reported using the alley. Fitness equipment was only available at Bradley Green Alley; therefore, no comparison was made for this category.

Walking

Results indicated a statistically significant association between site and walking as a reported purpose of alley use, $\chi^2(1) = 6.236$, $p = .013$. A greater proportion of Bradley Green Alley respondents reported using the alley for walking (65.9%) compared to respondents near Carlisle Street Alley (46.7%).

Observational data collected using the SPACES for Alleys tool reflected this pattern: walking was the most frequently observed activity at both sites, but it occurred more frequently and consistently across observation periods at Bradley Green Alley.

Active Travel (Bike and/or Scooter)

A greater proportion of Bradley Green Alley respondents (18.7%) reported using the

alley for biking compared to Carlisle Street Alley respondents (10.7%). However, this difference was not statistically significant, $\chi^2(1) = 2.07$, $p = .151$.

SPACES observations also captured occasional biking activity at both sites, though it was more commonly observed at Bradley Green Alley. In some instances, the same individuals were observed biking during repeated observation periods, suggesting routine or habitual use of the alley for this purpose.

Running or Jogging

A greater proportion of Bradley Green Alley respondents (6.6%) reported using the alley for running compared to respondents near Carlisle Street Alley (1.3%). However, this difference was not statistically significant, $\chi^2(1) = 2.82$, $p = .093$.

Commuting

There was no statistically significant difference in reported commuting use between sites, $\chi^2(1) = 0.014$, $p = .907$. Similar proportions of respondents from Bradley Green Alley (72.5%) and Carlisle Street Alley (73.3%) reported using the alley as a cut-through or for commuting purposes.

SPACES observations at both sites indicated that many alley users passed directly through the space without stopping, often using the alley to access nearby destinations such as local markets or returning home. At Carlisle Street Alley, a higher number of individuals were observed commuting by car, using the alley to reach residential driveways and business parking lots with direct alley access. These patterns reflect the functional role of both alleys as community routes that support everyday travel within the community.

Fitness Equipment (Bradley Green Alley Only)

Use of the outdoor fitness equipment was only assessed at Bradley Green Alley, as no

comparable equipment was available at Carlisle Street Alley. Among respondents who reported using the alley, 11.0% indicated that they used the fitness equipment during their visits, while the majority (89.0%) reported not using the equipment.

SPACES observations documented very limited use of the exercise equipment at Bradley Green Alley. Across a total of 25 observation periods, the equipment was actively used only during two sessions. When observed in use, the equipment was typically used briefly by an adult in the afternoon and early evening.

During the initial site visits, as shown in Figure 20, one of the machines was visibly damaged and taped off. On the fifth observation visit, the damaged equipment had been removed from the site.

Figure 20

Damaged fitness equipment at Bradley Green Alley.

Note. Photograph captured by author (2025).

In summary, walking was the most reported purpose of alley use and was significantly more common among Bradley Green Alley respondents. Although other activities such as biking and running were more frequently reported at Bradley Green Alley, these differences were not statistically significant. SPACES observations aligned with survey findings and revealed additional context such as limited use of fitness equipment due to disrepair. As shown in Table 6, these findings suggest that while revitalized alleys may support a broader range of physical activities, walking and travel-related use remain the most prominent across both sites.

4.4 Perceptions of Safety and Accessibility

This section presents survey findings related to residents' perceptions of safety, accessibility, and environmental conditions at Bradley Green Alley and Carlisle Street Alley. Perceptions of the alley environment were assessed using Likert-scale questions and categorical response options addressing safety during daytime and nighttime, ease of access, perceived barriers to use, and satisfaction with environmental features. Statistical analyses were conducted to compare perceptions between the revitalized and non-revitalized alley sites.

4.4.1 Perceived Safety

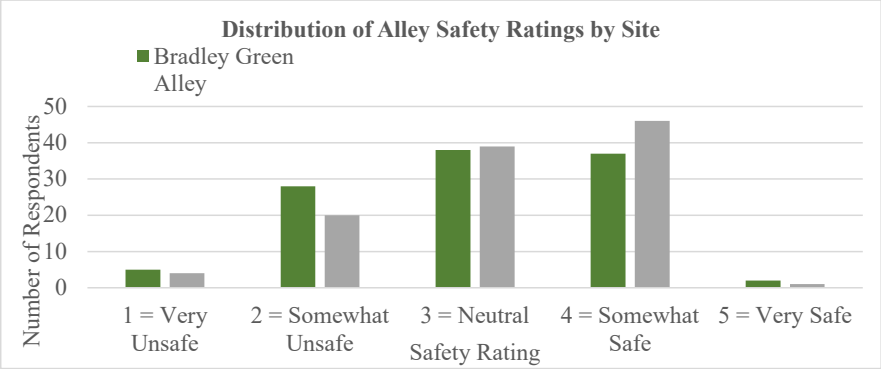
An independent samples t-test was conducted to compare perceptions of alley safety between Bradley Green Alley and Carlisle Street Alley. As presented in Table 7 and illustrated in Figure 21, respondents near Carlisle Street Alley reported slightly higher safety ratings ($M = 3.18$, $SD = 0.87$) compared to Bradley Green Alley respondents ($M = 3.03$, $SD = 0.92$), but this difference was not statistically significant, $t(218) = -1.28$, $p = .203$. The effect size was small (Cohen's $d = -0.17$), suggesting minimal practical difference between the two sites in terms of perceived safety.

Table 7
Perceived Safety Ratings by Site (Bradley Green Alley vs. Carlisle Street Alley)

Safety Perception	Bradley Mean (SD)	Carlisle Mean (SD)	t(df)	p-value	Cohen's d
Alley Safety Rating	3.03 (0.92)	3.18 (0.87)	-1.28 (218)	.203	-0.17

Note. Mean values reflect perceived safety ratings on a scale of 1 to 5, with higher scores indicating greater perceived safety.

Figure 21
Distribution of alley safety ratings (1 = very unsafe to 5 = very safe) by site.



Note. Chart compares self-reported safety perceptions between Bradley Green Alley and Carlisle Street Alley (n=110 per site).

While survey results indicated no statistically significant differences in perceived safety between sites, observational experiences provided additional context regarding safety conditions within each alley. At Bradley Green Alley, visible gang-related graffiti commonly associated with local gang presence were observed during site visits. On one occasion, police officers patrolling the area advised the researcher to exercise caution due to recent gang-related incidents in the alley. At Carlisle Street Alley, the primary safety concern observed during evening visits was the limited lighting, which created a more isolated atmosphere compared to the revitalized site. These observations underscore the complexity of perceived safety in disadvantaged

communities, where informal knowledge and environmental stressors may shape user behavior in ways not fully captured through survey responses alone. These environmental features may influence residents' willingness to use the alley for physical activity or active travel, highlighting how environmental conditions may shape engagement with alley spaces and contribute to differences in physical activity and frequency of use across sites.

4.4.2 Perceived Accessibility for Physical Activity

Perceived accessibility was measured through a question in the self-reported survey that asked participants to rate how accessible they found the alley for engaging in physical activity. Response options were presented on a 5-point Likert scale:

1= Very Inaccessible

2 = Somewhat Inaccessible

3 = Neutral

4 = Somewhat Accessible

5 = Very Accessible

This variable served as a key indicator of how participants subjectively evaluated the alley's physical environment in terms of its suitability for walking, biking, or other forms of active use. Higher scores indicated more favorable perceptions of accessibility. Perceived accessibility was analyzed descriptively and comparatively across the two alley sites to assess whether revitalization was associated with differences in how accessible the alleys were viewed for physical activity.

An independent samples t-test was conducted to examine differences in perceived accessibility for physical activity between the study sites. Results as shown in Table 8 indicated a statistically significant difference, $t(218) = 3.217$, $p = .001$, with residents near Bradley Green

Alley reporting higher perceived accessibility (M = 2.75, SD = 1.07) compared to those near Carlisle (M = 2.29, SD = 1.07). The mean difference was 0.464 (95% CI [0.180, 0.748]). The effect size was large (d = 1.069) suggesting that the difference in perceived accessibility between the two sites was not only statistically significant but also practically meaningful.

Table 8
Perceived Accessibility for Physical Activity by Alley Site (Bradley Green Alley vs. Carlisle Street Alley)

Variable	Alley Site	*n*	Mean	SD	*t* (df)	*p*-value	Mean Diff.	95% CI (Lower, Upper)	Cohen's *d*
Perceived Accessibility for Physical Activity	Bradley Green Alley	110	2.75	1.07	3.22 (218)	.001	0.464	[0.180, 0.748]	1.07
	Carlisle Street Alley	110	2.29	1.07					

These findings were further supported by SPACES observational data, which documented more consistent use of the Bradley Green Alley for physical activity - including walking and biking – as well as a higher frequency of group use compared to Carlisle Street Alley. This suggests that revitalized alley features not only improve perceived accessibility but may also foster social engagement and support greater levels of community-based physical activity.

4.4.3 Desired Improvements to Support Physical Activity

To better understand resident preferences for enhancing alley usability, survey participants were asked to select all improvements that would make them more likely to use the alley for physical activity. Since respondents could select multiple options, percentages are reported separately for each improvement category. Table 9 summarizes the distribution of desired improvements across Bradley Green Alley and Carlisle Street Alley respondents. Chi-

Square tests of independence were conducted to assess whether the level of support for each improvement differed significantly between the two sites.

Table 9
Reported Desired Improvements to Support Physical Activity by Site

Desired Improvement	Bradley Green Alley %	Carlisle Street Alley %	Total %	χ^2(df)	p-value
Trees	27.3%	46.4%	36.8%	8.62 (1)	.003
Cleaner Environment	39.1%	32.7%	35.9%	0.97 (1)	.325
Lighting	58.2%	80.9%	69.5%	13.41 (1)	<.001
Fitness Equipment	51.8%	40.0%	45.9%	3.09 (1)	.079
No Improvements Needed	3.6%	1.8%	2.7%	0.69 (1)	.408

Note. Percentages reflect the proportion of respondents who selected each improvement option. Respondents were permitted to select multiple desired improvements; therefore, percentages do not sum to 100%.

As shown in Table 9, the most frequently selected improvement was lighting, with significantly greater support among Carlisle Street Alley participants (80.9%) compared to those near Bradley Green Alley (58.2%), $\chi^2(1) = 13.41$, $p < .001$. Trees were also selected more frequently by Carlisle respondents (46.4%) than Bradley respondents (27.3%), a difference that was statistically significant, $\chi^2(1) = 8.62$, $p = .003$. While support for fitness equipment was somewhat higher among Bradley respondents (51.8%) than Carlisle respondents (40.0%), this difference did not reach statistical significance ($p = .079$). No significant differences were found between sites in support for a cleaner environment or in selecting no improvements, indicating similar preferences across locations for those categories. Only a small proportion of respondents at either site indicated that no improvements were needed (≤4%), suggesting broad resident interest in alley enhancements to support physical activity.

4.4.4 Reported Barriers to Alley Use

To better understand why some residents reported never using the alley, those survey participants were asked to identify perceived barriers that discouraged their use. Respondents could select multiple options from a predefined list, which included safety concerns, lack of lighting, lack of amenities, lack of trees, and "none of the above." Table 10 summarizes the frequency of reported barriers by site.

Table 10
Perceived Barriers to Alley Use by Site

Barrier	Bradley Green Alley (n=17)	Carlisle Street Alley (n=35)	Total %	χ^2(df)	p-value
Safety Concerns	47.1%	20.0%	28.8%	4.08 (1)	.043*
Poor Lighting	11.8%	34.3%	26.9%	2.95 (1)	.086
Lack of Trees	5.9%	17.1%	13.5%	1.25 (1)	.264
Lack of Amenities	0.0%	5.7%	3.8%	1.01 (1)	.315
None of the above	52.9%	51.4%	51.9%	0.01 (1)	.918

Note. This table presents the percentage of respondents from each site who identified each listed barrier, and only respondents who reported never using the alley were asked this question. Total percentages reflect combined responses across both sites.

Commented [SB29]: Add asterisk to the items with a small p-value <0.05 (indicating statistical significance) in any tables.

To assess whether perceptions of barriers to alley use differed significantly between sites, a series of Chi-Square Tests of Independence were conducted for each barrier variable. The most frequently cited barriers across both sites were related to safety concerns and lighting conditions. A statistically significant difference was found for safety concerns, with respondents near Bradley Green Alley more likely to cite safety as a barrier compared to those near Carlisle Street Alley, $\chi^2(1, N = 52) = 4.08$, $p = .043$. While differences in perceptions of inadequate lighting approached statistical significance, $\chi^2(1, N = 52) = 2.95$, $p = .086$, a greater proportion of Carlisle

respondents identified poor lighting as a barrier (34.3%) than those near Bradley (11.8%). For other barriers—such as lack of trees, lack of amenities, and reporting no barriers ("none of the above")—no significant differences were observed. Notably, no respondents at Bradley Green Alley selected "lack of amenities" as a barrier, compared to a small number (5.7%) at Carlisle Street Alley; however, due to the extremely small number of affirmative responses and expected cell counts below 5, statistical comparison should be interpreted cautiously. Field notes and SPACES observations supported these findings, revealing lack of lighting, graffiti, and vehicular traffic as common deterrents. For example, during evening observations at Carlisle, low lighting levels contributed to a sense of isolation, while at Bradley, visible gang-related graffiti, along with discarded alcohol containers and tobacco product wrappers, appeared to influence perceptions of safety despite infrastructure improvements. These findings highlight the persistent role of perceived insecurity and visibility in shaping use of public spaces and suggest that such barriers may moderate or limit the positive effects of revitalized infrastructure on physical activity outcomes.

4.5 Summary of Key Findings

This chapter presented the results of survey data and systematic observations comparing physical activity engagement, patterns of alley use, and environmental perceptions between a revitalized and a non-revitalized alley site. Overall, findings indicate that residents living near Bradley Green Alley—revitalized site—reported longer durations of visits and greater perceived accessibility for physical activity than those near Carlisle Street Alley. While walking was the most common activity across both sites, it was reported and observed more frequently at the revitalized alley. Safety concerns and poor lighting emerged as the most frequently cited barriers, although perceptions varied by site. Despite similar self-reported safety ratings, field notes

highlighted contextual differences, including visible gang-related graffiti at Bradley Green Alley and inadequate lighting at Carlisle Street Alley. These results suggest that revitalization efforts may support greater physical activity and community engagement in alley spaces but must be paired with ongoing efforts to address safety and environmental quality. The next chapter discusses the implications of these findings in relation to the existing literature and planning practice.

CHAPTER 5:

DISCUSSION

This chapter reassesses the study's central research question: *Does proximity to a revitalized green alley increase residents' engagement in physical activity and frequency of alley use compared to a non-revitalized alley in disadvantaged communities?* Drawing on a mixed-methods approach, the study compared self-reported behaviors, observed use patterns, and perceptions of environmental conditions among residents living near a revitalized alley and a non-revitalized alley. The analysis examined how infrastructure quality, accessibility, and perceived safety influence physical activity in underserved communities.

Key findings indicate that Bradley Green Alley was associated with higher observed physical activity levels compared to Carlisle Street Alley. Survey data also revealed that a greater proportion of residents near Bradley Green Alley reported daily alley use (35.5%) compared to those near Carlisle Street Alley (30.9%). Conversely, a larger share of residents near Carlisle Street Alley reported never using the alley (31.8%) relative to Bradley Green Alley (17.3%). However, despite these trends, statistical analysis revealed a significant negative association between alley condition and frequency of use, suggesting that residents near the non-revitalized alley were slightly more likely to report lower usage frequencies.

Findings indicated longer visit durations at Bradley Green Alley and higher rates of walking as a primary activity, indicating that revitalization efforts may improve environmental features that encourage sustained use of public space. Perceived accessibility was notably higher among Bradley Green Alley users, suggesting that enhanced infrastructure may foster a more welcoming and walkable environment. However, safety perceptions did not differ significantly between sites, and field observations highlighted contrasting contextual deterrents. At Carlisle

Street Alley, poor lighting contributed to a sense of isolation. In contrast, at Bradley Green Alley, visible gang-related graffiti, litter from alcohol and tobacco use, and reports of recent gang activity underscored the persistent social challenges that may deter use despite infrastructure improvements.

The analysis of residents who reported never using the alleys further emphasized site-specific barriers. Safety concerns were more frequently cited near the revitalized alley, while poor lighting remained the primary concern at the non-revitalized site. These findings underscore the complexity of revitalization efforts — while improved infrastructure can enhance opportunities for physical activity, it may not fully mitigate longstanding social and environmental barriers.

Overall, the findings illustrate how revitalized alley spaces can influence physical activity engagement and perceptions, emphasizing the importance of integrating both physical and social context into public space design. Interpreting these results within the framework of multifunctionality and connectivity (Wright, 2011; Newell et al., 2013), this chapter situates green alleys as small-scale, place-based interventions that can support physical activity in underserved communities. However, addressing structural inequities and persistent barriers remains crucial to ensuring the long-term success of such projects, particularly in historically disinvested areas.

5.1 Theoretical and Empirical Interpretation of Findings

To better understand the study's results, the following section connects key findings to relevant theoretical frameworks and empirical literature on green infrastructure, the built environment, and urban health equity. Drawing from planning theory, this analysis explores how green alley revitalization influences physical activity behavior, perceptions of accessibility, and

persistent environmental barriers in historically underserved neighborhoods. Theoretical concepts such as multifunctionality, connectivity, and restorative environments offer insight into how infrastructure quality can shape opportunities for physical activity (Wright, 2011; Newell et al., 2013). At the same time, empirical studies on environmental injustice and unequal access to green infrastructure help explain why revitalization efforts may not fully eliminate barriers to active use in disinvested communities (Hamstead et al., 2018; Bantham et al., 2020). By integrating conceptual frameworks with empirical evidence, this section highlights how built environment interventions like green alleys can both support and constrain health-promoting behaviors in disadvantaged urban contexts.

5.2 Interpreting Use Patterns and Perceptions in Alley Settings

This section outlines key findings related to how residents engage with and perceive revitalized alley spaces, emphasizing the role of infrastructure quality, safety conditions, and broader environmental disparities in shaping physical activity behaviors. Findings from both survey data and systematic observations reveal that alley revitalization can support greater public space utilization. However, persistent contextual barriers highlight the limitations of physical design when social and environmental inequities remain unaddressed.

Physical Activity Engagement in Revitalized Alley Spaces

Residents living near Bradley Green Alley reported longer durations per visit and identified walking as their primary reason for using the alley. These patterns were reinforced by observation data, which documented higher activity levels at the revitalized site. This aligns with the green infrastructure goal of multifunctionality, which emphasizes the use of urban spaces to serve overlapping environmental, social, and health-related purposes (Newell et al., 2013). At Bradley Green Alley, revitalization not only functioned as a stormwater infrastructure project

contributing to the San Fernando Valley Groundwater Basin (Jacques, 2023), it also as a pedestrian connector supporting daily physical activity and improving walkability.

Walking, as the most dominant activity across both self-reported and observed data, reflects the importance of place-based interventions that allow residents to integrate physical activity into their daily routines. This is particularly important in disadvantaged communities where access to parks and recreational amenities is often limited. In the San Fernando Valley, where rates of obesity and physical inactivity exceed countywide averages (Los Angeles County Department of Public Health, 2024), small-scale green alley improvements may represent targeted strategy for addressing local health disparities and increasing physical activity (Seymour & Trindle, 2015).

Perceived Accessibility and Infrastructure Quality

Residents near Bradley Green Alley reported significantly higher perceived accessibility for physical activity than those near Carlisle Street Alley. This suggests that built environment features—such as improved lighting, walkable surfaces, and natural landscaping—created a more welcoming space. In contrast, poor lighting and visual neglect at Carlisle contributed to less favorable perceptions of the alley. These findings align with Stress Reduction Theory and Attention Restoration Theory (Ulrich, 1983; Kaplan & Kaplan, 1989), which suggest that natural, well-maintained environments can foster psychological readiness for activity by reducing stress and supporting cognitive function (Weber & Schneider, 2021). Although this study did not directly assess those psychological outcomes, the aesthetic and functional upgrades at Bradley may have contributed to greater ease of use and willingness to engage in physical activity.

Safety Perceptions and Persistent Social-Environmental Stressors

Despite the improved infrastructure at Bradley Green Alley, perceived safety ratings did not significantly differ between the two sites. Field observations provide important context: at Bradley Green Alley, signs of social disorder—including gang-related graffiti, discarded alcohol containers, and a police advisory about gang activity—created concerns about territoriality and personal safety. These findings align with research showing that visible signs disorder can shape public perceptions and deter use (Wolch et al., 2010; Cassidy et al., 2008). Meanwhile, at Carlisle Street Alley, the primary safety concern was poor lighting, which contributed to a sense of isolation, particularly during evening hours. These differing concerns reflect the context-specific nature of safety perceptions and suggest that revitalization must be paired with ongoing safety and maintenance strategies to sustain long-term benefits.

Barriers to Use and Environmental Inequity

Barriers to alley use were reported at both sites. At Carlisle Street Alley, poor lighting was the most frequently cited deterrent, while at Bradley Green Alley, nearly half of non-users identified safety concerns as their primary barrier. These patterns underscore that infrastructure upgrades alone are insufficient to overcome the deeper structural and environmental barriers rooted in long-standing disinvestment. As discussed in Chapter 2, disinvested communities often face cumulative environmental burdens—from deteriorating infrastructure to a lack of green space—which influence not only opportunities for physical activity but also broader public health outcomes (Hamstead et al., 2018; Bantham et al., 2020). The persistence of such barriers reinforces that physical inactivity in disadvantaged areas is shaped not solely by individual choice, but by systemic constraints that limit access to safe, equitable, and health-promoting environments.

5.3 Implications for Policy and Inclusive Urban Planning

Green alley revitalization offers a promising approach for expanding equitable access to public space and promoting physical activity in historically underserved communities. The findings of this study underscore the broader implications of historical redlining policies in shaping present-day infrastructure conditions and physical activity opportunities in communities like Pacoima and San Fernando. Despite the end of formal redlining practices decades ago, the legacy of disinvestment continues to manifest in limited access to green space, higher environmental burdens, and infrastructure neglect in formerly redlined areas.

Carlisle Street Alley, situated in a historically disinvested area, remains underutilized and in poor condition, while Bradley Green Alley demonstrates how targeted investments can begin to address these longstanding inequities. However, the observed discrepancies in usage patterns between revitalized and non-revitalized alleys suggest that physical infrastructure alone may not be sufficient to overcome deeply rooted perceptions of safety and accessibility in historically marginalized areas. Integrating community engagement, targeted programming, and culturally relevant design features could further strengthen the impact of green alley interventions, positioning them as more effective strategies for addressing health and infrastructure inequities in redlined neighborhoods.

In addition, field observations at Bradley revealed broken fitness equipment and scattered trash, signaling that without routine upkeep and oversight, even revitalized spaces may deteriorate and lose community trust. These conditions reinforce the need for green infrastructure projects to be paired with sustained, community-informed strategies for safety, operations, and long-term maintenance.

As discussed in Chapter 2, effective green alley initiatives must go beyond surface-level

improvements to address structural legacies of disinvestment, exclusion, and environmental burden in low-income communities (Hamstead et al., 2018; Bantham et al., 2020). When implemented thoughtfully, green alleys can advance environmental justice by transforming neglected urban corridors into multi-functional spaces that support climate adaptation, neighborhood resilience, and public health (Newell et al., 2013). To sustain these outcomes, local governments must invest in reliable maintenance funding, cross-sector partnerships, and coordinated governance—especially in communities where jurisdiction boundaries complicate accountability. In unincorporated areas, where infrastructure responsibilities often fall between county and local agencies, targeted funding streams and intergovernmental agreements are essential to ensure long-term maintenance. In incorporated cities, aligning alley revitalization with existing capital improvement plans and community safety programs can improve efficiency and long-term impact. Integrating revitalization efforts with funding mechanisms and community input is critical to ensuring that green alleys remain inclusive, safe, and beneficial to the residents they are meant to serve.

5.4 Study Limitations and Future Research

While this study provides valuable insight into the relationship between green alley revitalization and physical activity engagement, several limitations must be acknowledged. The quasi-experimental design and lack of random assignment limits the ability to infer causality between alley improvements and observed behavior. The study relied on two non-randomized sites selected for their comparable demographic and environmental characteristics, which supports internal validity but constrains the generalizability of findings to other neighborhoods or cities. The modest sample size (n = 220), while balanced across sites, may not fully capture the diversity of perspectives within each community. In addition, reliance on self-reported survey

data introduces potential biases, such as recall error and social desirability effects. Although these were partially mitigated through structured field observations using the SPACES for Alley tool, the observation period was limited to a fixed set of days and times, which may not fully reflect variations in use across seasons or daily routines.

Furthermore, while both sites were chosen for broad comparability, the study did not control for all built environment variables that may also influence physical activity. Factors such as the quality and continuity of sidewalks, the presence of bike infrastructure, traffic volumes and speeds, history of traffic collisions, and access to other parks or open spaces in the community could all shape residents' decisions about where and how they engage in physical activity. Additionally, the study cannot account for residents who may engage in physical activity elsewhere in their neighborhood or beyond, outside of the alley itself. These limitations highlight the complexity of measuring place-based behavior change and reinforce the need for future research that incorporates more comprehensive environmental audits and mobility tracking tools to better contextualize observed use patterns.

Lastly, the study recognizes the governance distinction between the two case study sites as an important contextual consideration. Pacoima, as a neighborhood within the City of Los Angeles, operates under the infrastructure systems, public services, and policies of a large metropolitan municipality. In contrast, the City of San Fernando functions as an independent city with its own governance structure and resource allocation processes. Additionally, while Carlisle Street Alley is substantially longer in length than Bradley Green Alley, this difference reflects real-world variation in urban infrastructure. The study design accounted for this by selecting sites with comparable land uses, residential settings, and neighborhood characteristics, and by limiting the survey sample to residents living within a half-mile radius of each alley. Nonetheless, alley

length may influence patterns of use and resident behavior in ways that are not fully captured by the study.

These limitations suggest that the study's findings should be interpreted as context-specific and investigative. Future research should incorporate longitudinal designs to assess sustained behavioral changes over time and larger samples. Incorporating community-engaged and participatory evaluation methods can help ensure that revitalization efforts reflect residents' priorities. Such approaches are essential to building a strong evidence base to position green alley interventions as meaningful tools for advancing health equity and environmental justice in disinvested areas.

CHAPTER 6:

CONCLUSION

This research examined whether proximity to a revitalized green alley is associated with increased physical activity and more frequent alley use among residents in historically underserved communities. Using a mixed-methods approach that combined direct observations and self-reported surveys, the study compared two sites in Los Angeles County: Bradley Green Alley in Pacoima (revitalized) and Carlisle Street Alley in the City of San Fernando (non-revitalized). Results indicated that residents living near the revitalized alley engaged in higher levels of physical activity and stayed longer than those living near the non-revitalized site. Walking was the most reported and observed activity, especially at Bradley Green Alley. Respondents also perceived the revitalized space as more accessible for physical activity, suggesting that design features such as shade, lighting, and pedestrian-friendly elements may encourage regular use. However, persistent barriers—especially safety concerns—continue to limit engagement, emphasizing the need for complementary community-based strategies alongside physical improvements.

These findings align with broader focuses in urban planning that emphasize the value of small-scale, equity-focused interventions in converting neglected spaces into community assets. Green alleys demonstrate how underutilized space can be repurposed to support physical activity, address spatial inequities, and respond to climate and public health challenges in dense, park-poor neighborhoods. By centering attention on alleys—often overlooked in conventional planning—this study offers insight into how localized green infrastructure can advance health equity and spatial justice. It also underscores the importance of engaging residents throughout the planning process, as community input can reveal underlying needs and concerns that are not

always evident through observation alone.

To ensure long-term success of these interventions, green alleys should be integrated into broader public health, sustainability, and climate adaptation frameworks. Their multifunctional benefits—from reducing urban heat and stormwater runoff to enhancing walkability—make them a valuable elements of resilient city planning. However, regular maintenance, cross-sector collaboration among public agencies, and sustained funding are essential for ensuring their ongoing success. Smaller jurisdictions may benefit from targeted grant programs, climate bonds, or public-private partnerships to support both implementation and upkeep.

In conclusion, this research highlights the potential of green alley revitalization to foster more equitable access to active public space. While findings show a link between revitalized infrastructure and increased physical activity, they also reveal enduring environmental and social barriers. These mixed outcomes suggest that alley interventions, though promising, must be part of a broader strategy that includes safety improvements, long-term maintenance, and community trust. In cities like Los Angeles, where public health, climate vulnerability, and infrastructure neglect intersect, green alleys represent a potential model for building healthier, more resilient urban neighborhoods.

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APPENDIX A:

RESIDENT SURVEY

Bradley Green Alley

California State Polytechnic University, Pomona
Survey Questions for Research Involving Human Subjects

Project Title: Evaluating the Impact of Green Alleys on Physical Activity: A Comparative Study of Bradley Green Alley and Carlisle Street Alley

Bradley Green Alley Survey

1. Are you 18 years of age or older, and do you live within a half-mile of Bradley Green Alley located on Van Nuys Blvd. and Bradley Ave. in Pacoima, CA? *
   - o Yes
   - o No
2. How often do you use Carlisle Street Alley?
   - o Daily
   - o A few times a week
   - o A few times a month
   - o Rarely
   - o Never → **If response is "NEVER" skip to question #8**
3. Bradley Green Alley was renovated in October 2020, how has your use of the alley as renovated?
   o Increased o Stayed the same o Decreased
4. What activities do you typically engage in while using Bradley Green Alley? (Select all that apply)
   o Walking o Running or Jogging o Bicycle or Scooter o Exercise Equipment o Commuting o None of the above
5. On average, how long do you spend in the alley during a visit?
   o Less than 10 minutes o 10-30 minutes o More than 30 minutes
6. Do you use the alley more during the daytime or nighttime?
   o Only at daytime o Primarily during the day o Both equally o Primarily at night o Only at night
7. Do you visit Bradley Green Alley with other family members, such as parents and/or children?
   o Yes, with parents o Yes, with children o Yes, with both parents and children o Yes, with other family members and not with your parents or children o No
8. What are the reasons that you do NOT use the alley? (Select all that apply)
   o Safety concerns o Lack of lighting o Lack of amenities o Lack of trees o None of the above
9. On a scale of 1 to 5, how would you rate the safety of the alley?
   o 1 = very unsafe o 2 = somewhat unsafe o 3 = neutral o 4 = somewhat safe o 5 = very safe
10. **For physical activity**, how accessible do you find the alley for physical activity?
    o Very accessible o Somewhat accessible o Neutral o Somewhat inaccessible o Very inaccessible

11. What improvements would make you more likely to use the alley for physical activity? (Select all that apply)

o Better lighting o Shaded areas or trees o Fitness Equipment o Cleaner environment o None of the above

12. What is your age?

o 18-34 o 35-49 o 50-64 o 65+

13. What is your gender?

o Female o Male o Non-binary o Prefer not to say

14. What is your ethnicity? (Select all that apply)

- o Hispanic or Latino
- o Black or African American
- o White
- o Asian or Asian American
- o Middle Eastern
- o Multiracial or Mixed Ethnicity
- o Prefer not to answer
- o Other

15. How long have you lived in Pacoima?

o Less than 1 year o 1-5 years o 6-10 years o More than 10 years

16. What is your approximate annual household income?

- o Less than $25,000
- o $25,000 - $49,999
- o $50,000 - $74,999
- o $100,000 or more
- o Prefer not to say

Carlisle Street Alley

California State Polytechnic University, Pomona
Survey Questions for Research Involving Human Subjects

Project Title: Evaluating the Impact of Green Alleys on Physical Activity: A Comparative Study of Bradley Green Alley and Carlisle Street Alley

Carlisle Street Alley Survey

1. Are you 18 years of age or older, and do you live within a half-mile of Carlisle Street Alley on Carlisle Street from Pico Street to O'Melveny Avenue in the City of San Fernando? *
   - o Yes
   - o No
2. How often do you use Carlisle Street Alley?
   - o Daily
   - o A few times a week
   - o A few times a month
   - o Rarely
   - o Never → **If response is "NEVER" skip to question #7**
3. What activities do you typically engage in while using Carlisle Street Alley? (Select all that apply)

   o Walking o Running or Jogging o Bicycle or Scooter o Commuting o None of the above
4. On average, how long do you spend in the alley during a visit?

   o Less than 10 minutes o 10-30 minutes o More than 30 minutes

5. Do you use the alley more during the daytime or nighttime?
   - ○ Only during the daytime
   - ○ Primarily during the daytime
   - ○ Both equally
   - ○ Primarily at night
   - ○ Only at night

6. Do you visit Carlisle Street Alley with other family members, such as parents and/or children?
   - ○ Yes, with parents
   - ○ Yes, with children
   - ○ Yes, with both parents and children
   - ○ Yes, with other family members and not with your parents or children
   - ○ No

7. What are the reasons that you do NOT use the alley? (Select all that apply)
   - ○ Safety concerns
   - ○ Lack of lighting
   - ○ Lack of amenities
   - ○ Lack of trees
   - ○ None of the above

8. On a scale of 1 to 5, how would you rate the safety of the alley?
   - ○ 1 = very unsafe
   - ○ 2 = somewhat unsafe
   - ○ 3 = neutral
   - ○ 4 = somewhat safe
   - ○ 5 = very safe

9. How accessible do you find the alley for physical activity?
   - ○ Very accessible
   - ○ Somewhat accessible
   - ○ Neutral
   - ○ Somewhat inaccessible
   - ○ Very inaccessible

10. What improvements would make you more likely to use the alley for physical activity? (Select all that apply)
    - ○ Better lighting
    - ○ Shaded areas or trees
    - ○ Fitness Equipment
    - ○ Cleaner environment
    - ○ None of the above

11. What is your age?
    - ○ 18-34
    - ○ 35-49
    - ○ 50-64
    - ○ 65+

12. What is your gender?
    - ○ Female
    - ○ Male
    - ○ Non-binary
    - ○ Prefer not to say

13. What is your ethnicity? (Select all that apply)
    - ○ Hispanic or Latino
    - ○ Black or African American
    - ○ White
    - ○ Asian or Asian American
    - ○ Middle Eastern
    - ○ Multiracial or Mixed Ethnicity
    - ○ Prefer not to answer
    - ○ Other

14. How long have you lived in the City of San Fernando?
    - ○ Less than 1 year
    - ○ 1-5 years
    - ○ 6-10 years
    - ○ More than 10 years

15. What is your approximate annual household income?
    - ○ Less than $25,000
    - ○ $25,000 - $49,999
    - ○ $50,000 - $74,999
    - ○ $100,000 or more
    - ○ Prefer not to say

APPENDIX B:

ONLINE QUALTRICS SURVEY

Default Question Block

Are you 18 years of age or older, and do you live within a half-mile of the Bradley Plaza and Green Alley located on Van Nuys Blvd. and Bradley Ave. in Pacoima, CA?

Please click here to confirm that you live within the highlighted area, then click the back button on your browser to return to this survey.

¿Tiene 18 años o más y vive a menos de media milla del callejón Bradley/Plaza ubicada en Van Nuys Blvd y Bradley Ave. en Pacoima, CA?

Haga clic aquí para confirmar que vive dentro del área resaltada, luego haga clic en el botón Atrás de su navegador para regresar a esta encuesta.

- ○ Yes / Sí
- ○ No

Thank you for your interest in participating in this research study titled "Evaluating the Impact of Green Alleys on Physical Activity: A Comparative Study of Bradley Green Alley and Carlisle Street Alley." Please select your preferred language below to complete the consent form for participation in this study.

Gracias por su interés en participar en este estudio de investigación titulado "Evaluación del impacto de los callejones verdes en la actividad física: un estudio comparativo de Bradley Green Alley y Carlisle Street Alley". Seleccione su idioma preferido para completar el formulario de consentimiento para participar en este estudio.

- ○ English
- ○ Español (Spanish)

Please click here to read the consent form to participate in the study. After reviewing the consent form, please click the back button to return to this survey.

Clicking that "I agree" below indicates that I have read the consent form and give my consent to participate in this research study titled "Evaluating the Impact of Green Alleys on Physical Activity: A Comparative Study of Bradley Green Alley

and Carlisle Street Alley." I fully understand that I may withdraw from this study at any time or choose not to answer any specific item or items without penalty. I am aware that there is no compensation for my participation. Finally, I understand that information obtained about me during the course of the study will be kept anonymous and cannot be traced back to me.

○ I agree

Haga clic aquí para leer el formulario de consentimiento para participar en el estudio. Después de revisar el formulario de consentimiento, haga clic en el botón Atrás para regresar a esta encuesta.
Al hacer clic en "Acepto" a continuación, indica que he leído el formulario de consentimiento y doy mi consentimiento para participar en este estudio de investigación titulado "Evaluación del impacto de los callejones verdes en la actividad física: un estudio comparativo de Bradley Green Alley y Carlisle Street Alley". Entiendo completamente que puedo retirarme de este estudio en cualquier momento o elegir no responder sin penalización. Soy consciente de que no hay compensación por mi participación. Finalmente, entiendo que la información obtenida sobre mí durante el curso del estudio se mantendrá anónima y no se podrá rastrear hasta mí.

○ Acepto

How often do you use Bradley Green Alley?

¿Con qué frecuencia utiliza el callejón Bradley/Plaza?

○ Daily / Diariamente
○ A few times a week / Algunas veces a la semana
○ A few times a month / Algunas veces al mes
○ Rarely / Casi nunca
○ Never / Nunca

Bradley Green Alley was renovated in October 2020, how has your use of the alley as renovated?

Callejón Bradley/Plaza fue renovado en octubre de 2020, ¿cómo se renovó su uso del callejón?

- ○ Increased / Aumento
- ○ Stayed the same / Se mantuvo igual
- ○ Decreased / Disminuido

What activities do you typically engage in while using Bradley Green Alley? (Select all that apply)

¿Qué actividades realiza habitualmente mientras utiliza el callejón Bradley/Plaza? (Seleccione todo lo que corresponda)

- ☐ Walking / Caminar
- ☐ Running or Jogging / Correr or trotar
- ☐ Biking or Cycling / Andar en bicicleta
- ☐ Commuting / Viajar a diferentes lugares
- ☐ Fitness Equipment / Equipo de gimnasio
- ☐ None of the above / Ninguna de estas opciones

On average, how long do you spend in the alley during a visit?

De promedio, ¿cuánto tiempo pasa usted en el callejón durante una visita?

- ○ Less than 10 minutes / Menos de 10 minutos
- ○ 10-30 minutes / 10-30 minutos
- ○ More than 30 minutes / Más de 30 minutos

Do you use the alley more during the daytime or during the evening/nighttime?

¿Utilizas más el callejón durante el día o por la tarde?

- ○ Only during the daytime / Sólo durante el día
- ○ Primarily during the daytime / Principalmente durante el día
- ○ Both equally / Ambos por igual
- ○ Primarily during the evening or nighttime / Principalmente por la tarde o de noche
- ○ Only in the evening and night / Sólo por la tarde y de noche

Do you visit Bradley Green Alley with other family members, such as parents and/or children?

¿Visitas el callejón de Bradley Ave. con otros miembros de la familia, como padres y/o hijos?

- ○ Yes, with parents / Sí, con mis padres
- ○ Yes, with children /Sí, con mis hijos
- ○ Yes, with both parents and children / Sí, con mis padres y con mis hijos
- ○ Yes, with other family members and not with your parents or children / Sí, con otros miembros de mi familia, pero no con mis padres o hijos
- ○ No

What are the reasons that you do NOT use the alley? (Select all that apply)

¿Cuáles son las razones por las que NO usas el callejón? (Seleccione todo lo que corresponda)

- ☐ Safety concerns / Preocupaciones de seguridad
- ☐ Lack of lighting / Falta de luces o iluminación en el callejón
- ☐ Lack of amenities / Falta de comodidades
- ☐ Lack of trees / Falta de árboles
- ☐ None of the above / Ninguna de estas opciones

On a scale of 1 to 5, how would you rate the safety of the alley?

En una escala del 1 al 5, ¿cómo calificarías la seguridad del callejón?

- ○ 1 = Very Unsafe / Muy inseguro
- ○ 2 = Somewhat unsafe / Algo inseguro
- ○ 3 = Neutral
- ○ 4 = Somewhat safe / Algo seguro
- ○ 5 = Very safe / Muy seguro

For physical activity, how accessible do you find the alley for physical activity?

¿Para la actividad física qué tan accesible encuentras el callejón?

- ○ Very accessible / Muy accesible
- ○ Somewhat accessible / Algo accesible
- ○ Neutral
- ○ Somewhat inaccessible / Algo inaccesible
- ○ Very inaccessible / Muy inaccesible

What improvements would make you more likely to use the alley for physical activity? (Select all that apply)

¿Qué mejoras te harían más propenso a utilizar el callejón para realizar actividad física? (Seleccione todo lo que corresponda)

- ☐ Better lighting / Más luces y mejor iluminación
- ☐ Shaded areas or trees / Áreas de sombra o árboles
- ☐ Fitness equipment / Equipo de gimnasia
- ☐ Cleaner environment / Ambiente más limpio
- ☐ None of the above / Ninguna de las opciones anteriores

What is your age?

¿Cuál es tu edad?

- ○ 18-34
- ○ 35-49
- ○ 50-64
- ○ 65+

What is your gender?

¿Cuál es tu género?

- ○ Male / Masculino
- ○ Female / Femenina
- ○ Non-binary / No binario
- ○ Prefer not to say / Prefiero no decir

What is your ethnicity? (Select all that apply)

¿Cuál es su origen étnico? (Seleccione todo lo que corresponda)

- ☐ Hispanic or Latino / Hispano o Latino
- ☐ Black or African American
- ☐ White
- ☐ Asian or Asian American
- ☐ Middle Eastern
- ☐ Multiracial or Mixed Ethnicity / Multirracial o de Origen Mixto
- ☐ Prefer not to answer / Prefiero no responder
- ☐ Other/ Otro

How long have you lived in Pacoima?

¿Cuánto tiempo llevas viviendo en Pacoima?

- ○ Less than 1 year / Menos de 1 año
- ○ 1-5 years / 1-5 años
- ○ 6-10 years / 6-10 años
- ○ More than 10 years / Más de 10 años

What is your approximate annual household income?

¿Cuál es el ingreso anual aproximado de su hogar?

- ○ Less than $25,000 / Menos de $25,000
- ○ $25,000 - $49,999
- ○ $50,000 - $74,999
- ○ $75,000 - $99,999
- ○ $100,000 or more / $100,000 o más
- ○ Prefer not to say / Prefiero no decir

APPENDIX C:

SPACES FOR ALLEY OBSERVATION TOOL

SPACES (Systemic Pedestrian and Cycling Environmental Scan) instrument to assess key environmental features and observations of physical activity in the alleys

Date: _____
Observation Time: _____
Location: _____
Weather conditions: _____

Functionality: Infrastructure

A. **Path for walking &/or cycling** *(only if a path is present)*
   1. **Type of Path:**
      - 1, No Path – *go to section B*
      - 2, Footpath
      - 3, Shared path – with markings
      - 4, Shared use path – no marking
   2. **Path condition & smoothness**
      - 1, Poor (a lot of bumps, cracks, holes & weeds)
      - 2, Moderate (some bumps, cracks, holes & weeds)
      - 3, Good (very few bumps, cracks, holes & weeds)
      - 4, Under repair

B. **On-road**
   1. **Path type:**
      - 1, On-road no lane marked
      - 2, On-road- cycle lane – marked
   2. **Condition of road:**
      - 1, Poor (a lot of bumps, cracks, holes & weeds)
      - 2, Moderate (some bumps, cracks, holes & weeds)
      - 3, Good (very few bumps, cracks, holes & weeds)
      - 4, Under repair

Safety

A. **Lighting**
   1. **Streetlights present?**
      - 1, no – *skip to Section E*
      - 2, yes
   2. **Does lighting cover the path area?**
      - 1, no
      - 2, yes
   3. **Lighting Quality** (Observation night & day)
      - 1, Poor
      - 2, Fair
      - 3, Well- lit

B. **Traffic flow (vehicle access)**
   - 1, high
   - 2, low
   - 3, none

C. **Presence of security cameras**
   - 1, not present
   - 2, present

Signage

A. **Directional Signage** (indicating location or path directions)
   - 1, not present
   - 2, present

B. **Information Signage** (rules, hours of use, safety info)
   - 1, not present
   - 2, present

Aesthetics

A. **Cleanliness**
   - 1, high amounts of trash
   - 2, some trash
   - 3, clean

B. **Trash Receptacles**
   - 1, not present
   - 2, present

C. **Greenery/ Landscaping Presence**
   - 1, none
   - 2, some
   - 3, abundant

D. **Presence of vandalism**
   - 1, present
   - 2, not present

E. **Wall Maintenance**
   - 1, poor (extensive cracks, chips, or peeling paint)
   - 2, moderate (some cracks, chips, or peeling paint)
   - 3, good (no visible cracks, chips, or peeling paint)

Amenities

A. **Exercise Equipment**
   - 1, not present
   - 2, present, in poor condition
   - 3, present, in moderate condition
   - 4, present, in good condition

B. **Benches/ Sitting Areas**
   - 1, not present
   - 2, present

	Total People Observed
Physical Activity Walking Jogging / Running Bicycling	
Social Behavior Individuals Small groups (2-4) Large groups (5+)	
Demographics Children (0-12) Teens (13-18) Adults (19-64) Seniors (65+)	

Presence/Absence of People
- 1, empty (0 people present)
- 2, occupied (1 or more people present)

APPENDIX D:

RECRUITMENT FLYERS

Bradley Green Alley

Carlisle Street Alley